Vol. 116, No. 2, August 2020

The course offerings and requirements of the University of Notre Dame are continually under examination, and revisions are expected. This Bulletin of Information is not a contract; it merely presents the offerings and requirements in effect at the time of publication and in no way guarantees that the offerings and requirements will remain the same. Every effort is made to provide advance information of any changes.

2020–21
Bulletin of Information
University of Notre Dame
Undergraduate Programs

Nondiscrimination
The University of Notre Dame does not discriminate on the basis of race, color, national or ethnic origin, sex, disability, veteran status or age in the administration of any of its educational programs, admissions policies, scholarship and loan programs, athletic and other school-administered programs or in employment.

The University has designated the Director of its Office of Institutional Equity to handle all inquiries regarding its efforts to comply with and carry out its responsibilities under Title IX and under Section 504 of the Rehabilitation Act of 1973. The Title IX and Section 504 coordinator may be contacted as follows:

Director
Office of Institutional Equity
100 Grace Hall
University of Notre Dame
Notre Dame, IN 46556
(574) 631-0444
# Table of Contents

3 President’s Leadership Council  
4 Board of Trustees  
5 Emeritus Trustees  
5 Hesburgh Trustees  
6 Academic Calendar  
10 Mission Statement of the University of Notre Dame  
11 Notre Dame’s Vision for Undergraduate Education  
12 Intercollegiate Athletics  
13 Campus Security and Fire Safety  
13 The Spirit of Inclusion at Notre Dame  
14 Academic Profile  
15 University Requirements  
17 Graduation Rate  
17 Grading System  
18 Academic Code of Honor  
18 The Undergraduate Academic Code  
18 Notre Dame NetID Student Policy  
18 Hesburgh Libraries  
18 Using Notre Dame Email  
19 Academic Resources  
20 Admission  
22 Fees and Expenses  
24 Student Financial Aid  
26 Standards of Progress for Recipients of Financial Aid  
26 Center for Social Concerns  
28 Reserve Officers Training Corps Programs  
29 Study Abroad  
30 Moreau First Year Experience  
30 Information Technologies  
36 The Meruelo Family Center for Career Development  
36 Holy Cross Seminary Formation  
36 Saint Mary’s College.  

**THE OFFICE OF FIRST YEAR ADVISING AND ACADEMIC INITIATIVES**  
37 Moreau First Year Experience  
37 Voluntary Courses  
37 Credit and/or Placement by Examination  

**SCHOOL OF ARCHITECTURE**  
42 Student Awards and Prizes  
43 Student Organizations  
43 Advisory Council  

**COLLEGE OF ARTS AND LETTERS**  
46 Student Awards and Prizes  
48 Service Awards  
49 Special Arts and Letters Requirements  
49 Arts and Letters Programs  
49 Majors  
49 Minors  
49 Electives  
50 Africana Studies  
51 American Studies  
52 Anthropology  
53 Art, Art History, and Design  
56 Classics  
58 Computer Science  
59 East Asian Languages & Cultures  
61 Economics  
63 English  
64 Film, Television, and Theatre  
66 Gender Studies  
67 German and Russian Languages and Literatures  
69 History  
71 Irish Language and Literature  
71 Mathematics  
73 Medieval Studies  
74 Music  
75 Neuroscience and Behavior  
78 Philosophy  
79 Political Science  
80 Program of Liberal Studies  
81 Psychology  
82 Romance Languages and Literatures  
86 Sociology  
89 Theology  
91 Supplementary Majors, Minors, and Special Programs  
95 Interdisciplinary Minors within the College  
101 Officers of the Administration  
102 Advisory Council  

**MENDOZA COLLEGE OF BUSINESS**  
103 Programs of Study  
104 Curriculum for the Degree of Bachelor of Business Administration  
105 Study Abroad  
105 Collegiate Sequence in International Business  
105 Student Awards and Prizes  
106 Business Oriented Student Organizations and Activities  
107 Accountancy  
108 Finance  
109 Information Technology, Analytics, and Operations  
110 Management and Organization  
110 Marketing  
111 Non-Departmental Courses  
111 Officers of Administration  
112 Advisory Council  

**COLLEGE OF ENGINEERING**  
113 Programs and Degrees  
116 College Awards and Prizes  
116 Departmental Awards  
117 Student Organizations and Activities  
118 Aerospace and Mechanical Engineering  
120 Chemical and Biomedical Engineering  
122 Civil and Environmental Engineering and Earth Sciences  
125 Computer Science and Engineering  
126 Electrical Engineering  
127 Interdepartmental Engineering  
127 Dual Degree Programs  
130 Officers of Administration  
131 Advisory Council  

**KEOUGH SCHOOL OF GLOBAL AFFAIRS**  
132 Global Affairs  
132 Asian Studies  
133 European Studies  
133 International Development Studies  
134 Irish Studies  
134 Peace Studies  
135 Officers of the Administration  
135 Advisory Council  

**COLLEGE OF SCIENCE**  
136 Departments of the College of Science  
136 Undergraduate Education  
137 Curricula and Degrees  
138 University and College Requirements  
138 Student Organizations and Activities  
139 Student Awards and Prizes  
140 Special Opportunities  
140 Applied and Computational Mathematics and Statistics  
143 Biological Sciences  
150 Chemistry and Biochemistry  
154 Mathematics  
156 Neuroscience and Behavior  
158 Physics  
161 Preprofessional Studies  
166 Special Programs  
166 Dual Degree Program with the College of Engineering  
166 Dual Degree Program with the Mendoza College of Business  
167 Nondepartmental Courses  
167 Science Degree Credit  
169 Officers of Administration  
169 Advisory Council  

**170 FACULTY**  
222 CAMPUS MAP  
224 INDEX
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<td>REV. JOHN I. JENKINS, C.S.C.</td>
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<tr>
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<tr>
<td>DAVID C. BAILEY</td>
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<td>ROBERT J. BERNHARD</td>
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<tr>
<td>PAUL J. BROWNE</td>
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<td>LAURA A. CARLSON</td>
<td>Vice President and Associate Provost and Dean of the Graduate School</td>
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<tr>
<td>REV. AUSTIN I. COLLINS, C.S.C.</td>
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<td>MARIANNE CORR</td>
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<td>ANN M. FIRTH</td>
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<td>JOHN L. GOHSMAN</td>
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<td>REV. DANIEL G. GROODY, C.S.C.</td>
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<td>ERIN HOFFMANN HARDING</td>
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<td>MICKI L. KIDDER</td>
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<td>DOUGLAS K. MARSH</td>
<td>Vice President for Facilities Design and Operations and University Architect</td>
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<td>CHRISTINE M. MAZIAH</td>
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<td>ROBERT K. McQUADE</td>
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<td>LOUIS M. NANNI</td>
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<td>REV. GERARD J. OLINGER, C.S.C.</td>
<td>Vice President for Mission Engagement and Church Affairs</td>
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<tr>
<td>REV. HUGH R. PAGE JR.</td>
<td>Vice President and Associate Provost for Undergraduate Affairs</td>
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<td>MICHAEL E. PIPPENGER</td>
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<tr>
<td>BRYAN K. RITCHIE</td>
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<tr>
<td>MAURA A. RYAN</td>
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<td>MICHAEL D. SEAMON</td>
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<td>JOHN B. SWARBRICK JR.</td>
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July 1, 2020 – June 20, 2021
# Board of Trustees

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<td>July 1, 2020 – June 20, 2021</td>
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<tr>
<td>Mr. Carlos J. Betancourt</td>
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<td>São Paulo, Brazil</td>
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<tr>
<td>Mr. John J. Brennan</td>
<td>(Chair)</td>
<td>Valley Forge, Pennsylvania</td>
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<tr>
<td>Mr. Stephen J. Brogan</td>
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<tr>
<td>Mr. Kevin J. Buckley</td>
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<td>Richmond, Virginia</td>
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<tr>
<td>Mr. Thomas J. Crotty Jr.</td>
<td></td>
<td>Boston, Massachusetts</td>
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<td>Ms. Karen McCartan DeSantis</td>
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<td>Washington, D.C.</td>
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<tr>
<td>Ms. Dorene C. Dominguez</td>
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<td>Sacramento, California</td>
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<td>Mr. James J. Dunne III</td>
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<td>New York, New York</td>
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<td>Mr. James F. Flaherty III</td>
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<td>Los Angeles, California</td>
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<td>Ms. Celeste Vole Ford</td>
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<td>Ms. Stephanie A. Gallo</td>
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<tr>
<td>Ms. Carol Hank Hoffmann</td>
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<td>Rev. Paul V. Kollman, C.S.C.</td>
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<td>Ms. Diana Lewis</td>
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<td>Mr. Justin R. Liu</td>
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<td>Gardena, California</td>
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<td>Mr. Thomas G. Maheras</td>
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<td>New York, New York</td>
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<td>Mr. Andrew J. McKenna Jr.</td>
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<td>Dr. Danielle W. Merfeld</td>
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<td>Charlotte, North Carolina</td>
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<td>Mr. Michael G. O’Grady</td>
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<tr>
<td>Ms. Clare Stack Richer</td>
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<td>Mr. James E. Rohr</td>
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<td>Pittsburgh, Pennsylvania</td>
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<td>Ms. Shayla Keough Rumely</td>
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<td>Rev. John J. Ryan, C.S.C.</td>
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<tr>
<td>Ms. Jennifer F. Scanlon</td>
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<td>Mr. Byron O. Spruell</td>
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<td>Ms. Phyllis W. Stone</td>
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<td>Someret, New Jersey</td>
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<td>Mr. Timothy F. Sutherland</td>
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<td>Middleburg, Virginia</td>
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<tr>
<td>Ms. Anne E. Thompson</td>
<td></td>
<td>New York, New York</td>
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<tr>
<td>Ms. Sara Martinez Tucker</td>
<td></td>
<td>Dallas, Texas</td>
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<tr>
<td>Mr. John B. Veihmeyer</td>
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<td>Potomac, Maryland</td>
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<tr>
<td>Judge Ann C. Williams (ret.)</td>
<td></td>
<td>Chicago, Illinois</td>
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Emeritus Trustees

Ms. Kathleen W. Andrews  
Kansas City, Missouri
Rev. E. William Beauchamp, C.S.C.  
Notre Dame, Indiana
Ms. Cathleen P. Black  
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UNIVERSITY OF NOTRE DAME AND SAINT MARY’S COLLEGE
ACADEMIC YEAR CALENDAR FOR 2020-2021

FALL 2020 SEMESTER*

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<tr>
<th>Date</th>
<th>Day</th>
<th>Event</th>
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<tr>
<td>Aug. 3-4</td>
<td>Mon - Tue</td>
<td>Graduate School Orientation</td>
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<tr>
<td>Aug. 3-9</td>
<td>Mon - Sun</td>
<td>TENTATIVE - Staged undergraduate move-in</td>
</tr>
<tr>
<td>Aug. 10</td>
<td>Monday</td>
<td>Classes begin for Notre Dame and Saint Mary’s College</td>
</tr>
<tr>
<td>Aug. 16</td>
<td>Sunday</td>
<td>TENTATIVE - Last day to add classes at Saint Mary’s College</td>
</tr>
<tr>
<td>Aug. 17</td>
<td>Monday</td>
<td>Last date for all class changes at Notre Dame</td>
</tr>
<tr>
<td>Sept. 7</td>
<td>Monday</td>
<td>Labor Day - classes are in session</td>
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<tr>
<td>Sept. 11</td>
<td>Friday</td>
<td>Last day to drop classes at Saint Mary’s College</td>
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<tr>
<td>Sept. 28</td>
<td>Monday</td>
<td>Mid-Term deficiency reports submitted through insideND by 7 p.m.</td>
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<tr>
<td>Oct. 9</td>
<td>Friday</td>
<td>Last day for course discontinuance at Notre Dame</td>
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<tr>
<td>Nov. 3-15</td>
<td>Tues - Sun</td>
<td>Course Instructor Feedback administered at Notre Dame</td>
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<tr>
<td>Nov. 12</td>
<td>Thursday</td>
<td>Last class day</td>
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<tr>
<td>Nov. 13-15</td>
<td>Fri - Sun</td>
<td>Reading days (no examinations permitted)</td>
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<tr>
<td>Nov. 16-20</td>
<td>Mon - Fri</td>
<td>Final examinations (no review sessions permitted)</td>
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<tr>
<td>Nov. 22</td>
<td>Sunday</td>
<td>TENTATIVE - Undergraduate halls close at 2:00 p.m.</td>
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<tr>
<td>Nov. 23</td>
<td>Monday</td>
<td>Last day of Law School Final Exams</td>
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<td>Nov. 24</td>
<td>Tuesday</td>
<td>TENTATIVE - All grades due in PRISM by Noon at Saint Mary’s College</td>
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<tr>
<td>Nov. 30</td>
<td>Monday</td>
<td>All grades submitted through insideND by 3:45 p.m. at Notre Dame</td>
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<td>Nov. 30- Dec. 11</td>
<td>Mon - Fri</td>
<td>Registration appointments for Spring 2021 semester</td>
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<tr>
<td>Jan. 3</td>
<td>Sunday</td>
<td>January 2021 graduation date (no ceremony)</td>
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CLASS MEETINGS

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NUMBER OF CLASS DAYS

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*The University announced on May 18, 2020, to start the semester early, remove the Fall Break, and end the semester prior to Thanksgiving, due to the COVID-19.
Academic Calendar

SPRING 2021 SEMESTER - TENTATIVE

Jan. 10  Sunday  Undergraduate halls open for move-in beginning at 9:00 a.m.
Jan. 11  Monday  Orientation and advising for new students
Classes begin for Law and Graduate Business
Classes begin for Saint Mary’s College
Jan. 12  Tuesday  Classes begin for Notre Dame
Jan. 19  Tuesday  Last date for all class changes
Feb. 12  Friday  Last date to drop a class at Saint Mary’s College
Feb. 19-21 Fri - Sun  Junior Parents Weekend at Notre Dame
Mar. 6-14 Sat - Sun  Mid-Term break
Mar. 8  Monday  Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at ND
Mar. 9  Tuesday  Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint
Mar. 17  Wednesday  Registration begins for the 2021 Summer Session at Notre Dame
Mar. 19  Friday  Last day for course discontinuance at Notre Dame
Apr. 2-5  Fri - Mon  Easter Holiday
Apr. 12-21 Mon - Wed  Registration appointments for the Fall 2021 semester
April 15  Thursday  Priority date for 2021/2022 financial aid applications at ND (returning students)
Apr. 20-May 2 Tues - Sun  Course Instructor Feedback administered
April 28  Wednesday  Last class day for Notre Dame
April 29  Thursday  Last class day for Saint Mary's College
Apr. 29-May 2 Thur - Sun  Reading days for Notre Dame (no examinations permitted)
May 7-8  Mon-Fri  Final examinations (no review sessions permitted)
May 8  Saturday  Undergraduate halls close at 2:00 p.m.
May 10  Monday  All grades submitted through insideND by 3:45 p.m. at Notre Dame
May 11  Tuesday  All grades are due in PRISM by Noon at Saint Mary’s College
May 14-16 Fri - Sun  Commencement Weekend

CLASS MEETINGS*

| MWF  | 41 |
| MW   | 28 |
| TuTh | 29 |

NUMBERS OF CLASS DAYS*

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<tr>
<th>January</th>
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<td>14</td>
<td>13</td>
<td>70</td>
</tr>
</tbody>
</table>

*The number of class meetings and
class days differ for Saint Mary’s College

2021 SUMMER SESSION

First Class Day - June 14;  Last Class Day – July 23;  Graduation Date (No Ceremony) – August 1

NOTE: Summer Session classes will not be held on July 4 for most programs
# UNIVERSITY OF NOTRE DAME AND SAINT MARY'S COLLEGE
## JOINT ACADEMIC YEAR CALENDAR FOR 2021-2022

### FALL 2021 SEMESTER

<table>
<thead>
<tr>
<th>Date</th>
<th>Day</th>
<th>Event/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 16-17</td>
<td>Mon-Tues</td>
<td>Orientation and advising for new graduate students</td>
</tr>
<tr>
<td>Aug. 18-19</td>
<td>Wed-Thur</td>
<td>Orientation for new undergraduate international students</td>
</tr>
<tr>
<td>Aug. 19</td>
<td>Thursday</td>
<td>Transfer Welcome Weekend and advising for new undergraduate transfer students</td>
</tr>
<tr>
<td>Aug. 20</td>
<td>Friday</td>
<td>Undergraduate halls open for first-year student move-in beginning at 9:00 a.m.</td>
</tr>
<tr>
<td>Aug. 20-23</td>
<td>Fri-Mon</td>
<td>Welcome Weekend and advising for first-year undergraduate students</td>
</tr>
<tr>
<td>Aug. 22</td>
<td>Sunday</td>
<td>Undergraduate halls open for upperclass student move-in beginning at 9:00 a.m.</td>
</tr>
<tr>
<td>Aug. 23</td>
<td>Monday</td>
<td>Classes begin for Law and Graduate Business</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Classes begin for Saint Mary’s College</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orientation for readmitted students</td>
</tr>
<tr>
<td>Aug. 24</td>
<td>Tuesday</td>
<td>Classes begin for Notre Dame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mass - formal opening of school year at Notre Dame</td>
</tr>
<tr>
<td>Aug. 31</td>
<td>Tuesday</td>
<td>Last date for all class changes</td>
</tr>
<tr>
<td>Sept. 6</td>
<td>Monday</td>
<td>Labor Day - classes are in session</td>
</tr>
<tr>
<td>Sept. 24</td>
<td>Friday</td>
<td>Last date to drop a class at Saint Mary’s College</td>
</tr>
<tr>
<td>Oct. 16-24</td>
<td>Sat-Sun</td>
<td>Mid-Term break</td>
</tr>
<tr>
<td>Oct. 18</td>
<td>Monday</td>
<td>Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame</td>
</tr>
<tr>
<td>Oct. 19</td>
<td>Tuesday</td>
<td>Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary’s College</td>
</tr>
<tr>
<td>Oct. 29</td>
<td>Friday</td>
<td>Last day for course discontinuance at Notre Dame</td>
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<tr>
<td>Nov. 15-Dec.1</td>
<td>Mon-Wed</td>
<td>Registration appointments for the Spring 2022 semester</td>
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<tr>
<td>Nov. 24-28</td>
<td>Wed-Sun</td>
<td>Thanksgiving Holiday</td>
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<tr>
<td>Nov. 30-Dec.12</td>
<td>Tues-Sun</td>
<td>Course Instructor Feedback administered</td>
</tr>
<tr>
<td>Dec. 9</td>
<td>Thursday</td>
<td>Last class day</td>
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<tr>
<td>Dec. 10-12</td>
<td>Fri-Sun</td>
<td>Reading days (no examinations permitted)</td>
</tr>
<tr>
<td>Dec. 13-17</td>
<td>Mon-Fri</td>
<td>Final examinations (no review sessions permitted)</td>
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<tr>
<td>Dec. 18</td>
<td>Saturday</td>
<td>Undergraduate halls close at 2:00 p.m.</td>
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<tr>
<td>Dec. 20</td>
<td>Monday</td>
<td>All grades submitted through insideND by 3:45 p.m. at Notre Dame</td>
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<tr>
<td>Dec. 21</td>
<td>Tuesday</td>
<td>All grades due in PRISM by Noon at Saint Mary’s College</td>
</tr>
<tr>
<td>Jan. 2</td>
<td>Sunday</td>
<td>January 2022 graduation date (no ceremony)</td>
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### CLASS MEETINGS*

<table>
<thead>
<tr>
<th>Day</th>
<th>MW</th>
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<th>TuTh</th>
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<tr>
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### NUMBER OF CLASS DAYS*

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*The number of class meetings and class days differ for Saint Mary's College.

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**To Table of Contents**
SPRING 2022 SEMESTER

Jan. 9  Sunday  Undergraduate halls open for move-in beginning at 9:00 a.m.
Jan. 10  Monday  Orientation and advising for new students
Classes begin for Law and Graduate Business
Classes begin for Saint Mary’s College
Jan. 11  Tuesday  Classes begin for Notre Dame
Jan. 18  Tuesday  Last date for all class changes
Feb. 11  Friday  Last date to drop a class at Saint Mary’s College
Feb. 18-20  Fri - Sun  Junior Parents Weekend at Notre Dame
Mar. 5-13  Sat - Sun  Mid-Term break
Mar. 7  Monday  Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Mar. 8  Tuesday  Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary’s College
Mar. 16  Wednesday  Registration begins for the 2022 Summer Session at Notre Dame
Mar. 18  Tuesday  Last day for course discontinuance at Notre Dame
Apr. 11-22  Mon - Fri  Registration appointments for the Fall 2022 semester
April 15  Friday  Priority date for 2022/2023 financial aid applications at ND (for returning students)
Apr. 15-18  Fri - Mon  Easter Holiday
Apr. 19-May 1  Tues - Sun  Course Instructor Feedback administered
April 27  Wednesday  Last class day for Notre Dame
April 28  Thursday  Last class day for Saint Mary’s College
Apr. 28-May 1  Thur - Sun  Reading days for Notre Dame (no examinations permitted)
May 2-6  Mon - Fri  Final examinations (no review sessions permitted)
May 7  Saturday  Undergraduate halls close at 2:00 p.m.
May 9  Monday  All grades submitted through insideND by 3:45 p.m. at Notre Dame
May 10  Tuesday  All grades are due in PRISM by Noon at Saint Mary’s College
May 13-15  Fri - Sun  Commencement Weekend

CLASS MEETINGS*

MWF  41
MW  28
TuTh  29

NUMBER OF CLASS DAYS*

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<tr>
<th></th>
<th>Mon</th>
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*The number of class meetings and class days differ for Saint Mary’s College

2022 SUMMER SESSION (Regular 6-week)

First Class Day - June 13;  Last Class Day – July 22;  Graduation Date (No Ceremony) – July 31

NOTE: Summer Session classes will not be held on July 4 for most programs
Mission Statement of the University of Notre Dame

CONTEXT
This statement speaks of the University of Notre Dame as a place of teaching and research, of scholarship and publication, of service and community. These components flow from three characteristics of Roman Catholicism which image Jesus Christ, his Gospel, and his Spirit. A sacramental vision encounters God in the whole of creation. In and through the visible world in which we live, we come to know and experience the invisible God. In mediation the Catholic vision perceives God not only present in but also working through persons, events, and material things. There is an intelligibility and a coherence to all reality, discoverable through spirit, mind and imagination. God’s grace prompts human activity to assist the world in creating justice grounded in love. God's way to us comes as communion, through the communities in which men and women live. This community includes the many theological traditions, liturgies, and spiritualities that fashion the life of the church. The emphasis on community in Catholicism explains why Notre Dame historically has fostered familial bonds in its institutional life.

A Catholic university draws its basic inspiration from Jesus Christ as the source of wisdom and from the conviction that in him all things can be brought to their completion. As a Catholic university, Notre Dame wishes to contribute to this educational mission.

MISSION STATEMENT
The University of Notre Dame is a Catholic academic community of higher learning, animated from its origins by the Congregation of Holy Cross. The University is dedicated to the pursuit and sharing of truth for its own sake. As a Catholic university, one of its distinctive goals is to provide a forum where, through free inquiry and open discussion, the various lines of Catholic thought may intersect with all the forms of knowledge found in the arts, sciences, professions, and every other area of human scholarship and creativity.

The intellectual interchange essential to a university requires, and is enriched by, the presence and voices of diverse scholars and students. The Catholic identity of the University depends upon, and is nurtured by, the continuing presence of a predominant number of Catholic intellectuals. This ideal has been consistently maintained by the University leadership throughout its history. What the University asks of all its scholars and students, however, is not a particular creedal affiliation, but a respect for the objectives of Notre Dame and a willingness to enter into the conversation that gives it life and character. Therefore, the University insists upon academic freedom that makes open discussion and inquiry possible.

The University prides itself on being an environment of teaching and learning that fosters the development in its students of those disciplined habits of mind, body, and spirit that characterize educated, skilled, and free human beings. In addition, the University seeks to cultivate in its students not only an appreciation for the great achievements of human beings, but also a disciplined sensibility to the poverty, injustice, and oppression that burden the lives of so many. The aim is to create a sense of human solidarity and concern for the common good that will bear fruit as learning becomes service to justice.

Notre Dame also has a responsibility to advance knowledge in a search for truth through original inquiry and publication. This responsibility engages the faculty and students in all areas of the University, but particularly in graduate and professional education and research. The University is committed to constructive and critical engagement with the whole of human culture.

The University encourages a way of living consonant with a Christian community and manifest in prayer, liturgy, and service. Residential life endeavors to develop that sense of community and of responsibility that prepares students for subsequent leadership in building a society that is at once more human and more divine.

Notre Dame’s character as a Catholic academic community presupposes that no genuine search for the truth in the human or the cosmic order is alien to the life of faith. The University welcomes all areas of scholarly activity as consonant with its mission, subject to appropriate critical refinement. There is, however, a special obligation and opportunity, specifically as a Catholic university, to pursue the religious dimensions of all human learning. Only thus can Catholic intellectual life in all disciplines be animated and fostered and a proper community of scholarly religious discourse be established.

In all dimensions of the University, Notre Dame pursues its objectives through the formation of an authentic human community graced by the Spirit of Christ.

The University of Notre Dame

Notre Dame is at once a Catholic university, a national symbol, and an international community of religious faith, intellectual inquiry, and devotion to the powerless. Among its conspicuous features are its academic reputation, an elaborately designed and golden-domed administration building, a famous collegiate football team, a popular shrine to the Mother of God, two fascinating lakes, a pleasantly landscaped campus, and a spirited student body surrounded by an intensely loyal community of alumni and friends who unabashedly refer to themselves as the Notre Dame “family.” The institution was founded on the site of an old Catholic missionary outpost in 1842. The founders were a small and impoverished band of French and Irish religious brothers whose leader was Rev. Edward F. Sorin, C.S.C., an impetuous, strong-willed, and apparently tireless priest. In a memoir titled My Notre Dame, Thomas Stritch, professor emeritus of American Studies and Notre Dame historian, wrote that Father Sorin “carved Notre Dame out of the Northern Indiana wilderness and by sheer strength of character made it go. He built and rebuilt, recruited students where he could, and gradually began the unique image Notre Dame still enjoys. In a college or university, reputation is everything. Somehow Sorin developed a favorable one for Notre Dame, one that reverberated throughout the American Catholic world, the Eastern Seaboard as well as the Midwest. Long before football was invented, Notre Dame caught the imagination of American Catholics.”

Father Sorin was a member of the Congregation of Holy Cross, a then recently formed Catholic religious community that would own and administer the University from its foundation until 1967, when the University’s governance was legally transferred to a two-tiered, mixed board of lay and religious trustees and fellows. The University’s bylaws ensure that the Congregation will continue to exert a prominent influence on its administration. They stipulate, for example, that Notre Dame’s presidents must always be chosen from among the priests of the Congregation. The Congregation also ministers to the University it founded through the many Holy Cross priests serving on the University’s faculty, the counselors and chaplains who live with the undergraduate students in the residence halls, and the staff of the campus ministry office.

In 1972, five years after the change in governance, a new chapter of University history began to be written as the first undergraduate women were admitted to Notre Dame. A quarter of a century later, the majority of living Notre Dame alumni have been graduated from a fully coeducational institution. Obviously, many other aspects of the University have been changed by more than a century and a half of turbulent and unpredictable happenings in the Catholic Church and in American life and culture. Fires, outbreaks of infectious diseases, the Civil War, waves of European immigrants and refugees, Church controversies, the Great Depression, two world wars and several smaller bloodlettings, the civil rights movement, and other social convulsions in America, all have involved members of the Notre Dame family and have left deep and indelible imprints on the character and rich tradition of the institution. Rev. William Corby, C.S.C., a successor to Father Sorin, played a memorable national role as a Union chaplain at the Battle of Gettysburg. Rev. Julius Nieuwland, C.S.C., a scientist and faculty member,
invented synthetic rubber; Notre Dame students were participants in a nationally publicized scuffle with a resurgent Ku Klux Klan; the University’s colorful football team and something of its campus atmosphere were enshrined in American history and myth by a film featuring a memorable performance by an actor who later became a president. More recently, a second film dramatized the University’s spirit and gave a new name to unheralded athletes—Rudy.

Most notably, Notre Dame’s reputation, so zealously nurtured, sustained, and celebrated by Father Sorin and his successors, has become increasingly international in recent years because of the establishment of numerous academic and community service programs in the Holy Land, Mexico, Chile, Ireland, England, Austria, France, Italy, Spain, Australia, Japan, and other countries.

Despite these remarkable and generally welcome alterations in institutional shape and scope, Notre Dame’s proud and self-conscious claim to be a Catholic university and its intent to be a great Catholic university remain unchanged from Father Sorin’s day. The University boasts a core curriculum that includes required courses in theology and philosophy. In administrative and disciplinary affairs, Notre Dame holds itself responsible to the teaching of the Catholic Church, and it holds its students, faculty, and staff responsible for their own conduct, particularly in matters affecting the common good. Precisely because it is a Catholic university, it is a place where men and women from all faiths and backgrounds are to be made welcome. The staffs of the residence halls, campus ministry, the Center for Social Concerns, the Institute for Church Life, and the Alumni Association all continue to invite and encourage Notre Dame students, graduates, faculty, and administrators to pray together, to discuss and share their hopes, joys and sorrows, to bear with and sustain one another, and always to serve those most in need.

Notre Dame’s Vision for Undergraduate Education

Notre Dame is a vibrant academic community dedicated to scholarship and the advancement of knowledge, where students find opportunities on campus and abroad to develop initiative and leadership, and to learn by being fully engaged in our classrooms, libraries, research laboratories, studios, and residence halls among other venues. Notre Dame seeks to nurture in its students intellectual passion and a keenly developed moral sense, goals attainable only where freedom of thought and expression flourishes in a culture built on respect, responsibility, and integrity.

Drawing on our Catholic intellectual tradition, which fosters the integration of faith and reason, Notre Dame offers an undergraduate education rooted in the fundamental belief that all truths participate in the Divine Truth, a belief that motivates the vigorous search for knowledge.

Notre Dame inspires students to pursue learning as a good in itself and to see that pursuit as involving the whole person. We cultivate each student’s capacity to think creatively and critically while valuing the rich inheritance that comes from our shared past. We expect our graduates to be conversant with and equipped to contribute to the best thinking across the disciplines. Notre Dame helps students acquire the virtues necessary for living a good human life and prepares them to become leaders in their professions, for their communities, the Church, and the world.

As a community committed to service, we challenge students to grow in their understanding of complex human realities, and we call them to respond to the needs of the world with compassion and committed action. By educating students to be engaged by both their intellectual labors and their faith, we aspire to offer an education that is Catholic in the broadest sense of the word, both in welcoming all persons of good will to our university community and turning outward to embrace the larger world.

Formed by a rich liberal education and possessed of mature faith in service to others, our graduates leave Notre Dame prepared to take their places at the forefront of discovery, innovation, and human achievement.

Student Life

Notre Dame offers its students a quality education, made possible by an excellent faculty, advanced research facilities, experienced administration, and a well-developed educational philosophy. Education here also extends far beyond coursework and research, to the development and formation facilitated by residential and spiritual life, student development, and a culture grounded in the University’s Catholic, Holy Cross mission, which seeks to educate both the mind and the heart.

The Division of Student Affairs enriches the experience of Notre Dame students by offering services, resources, and engagement opportunities designed to develop students to their full potential. The Division oversees residential and extracurricular programs that promote community, faith, wellness, service, and discernment for the University’s student body.

Residential Life: Residential life is perhaps the most distinctive feature of the Notre Dame experience. At Notre Dame, residential life is designed to form undergraduate communities that are inclusive of all members; dedicated to the intellectual, moral, and spiritual development of each individual; and characterized by a collective sense of care and concern for the common good and service to others. The residence halls also form the base of many students’ spiritual, athletic, social, and volunteer service activities.

Each of Notre Dame’s 32 undergraduate residence halls has an atmosphere and character of its own. Unique traditions in each hall generate a feeling of loyalty and camaraderie among its residents. Well-trained rectors, assistant rectors, and senior resident assistants provide multiple layers of pastoral care for the students who call a Notre Dame residence hall “home.”

First-year students, sophomores, and juniors, beginning with the incoming class of 2018, are required to live on campus for six semesters. Study abroad facilitated through Notre Dame International automatically counts toward the fulfillment of the six-semester expectation, with other exceptions considered on an individual basis. Several hall leadership roles, along with incentives to stay in the halls, are available to seniors.

Spiritual Life: Notre Dame is a profoundly Catholic place, which means—at its core—all are welcome. Beliefs are strengthened by a commitment to God, to one another, and to the human family in love and service while at Notre Dame and throughout life.

The Office of Campus Ministry is rooted in the Catholic tradition and inspired by the charism and spirituality of the Congregation of Holy Cross, and works to bring education, the Catholic faith, and the hope of the Cross to students and the broader Notre Dame community. The office is dedicated to inspiring students to engage others about their faith and discovering their gifts for exercising leadership while at Notre Dame and within the wider Church. The office ministers faithfully and fervently to all students, regardless of denomination, faith tradition, or level of education at the University.

Through undergraduate, liturgical, and music ministries, Campus Ministry fosters personal spiritual growth, encourages participation in the sacramental and liturgical life of the Church, supports other forms of worship and personal prayer, provides opportunities for pilgrimages, retreats and service, aids in discernment, and seeks to enhance and develop lifelong faith formation.

Health and Wellness. The Health and Wellness Unit supports the Holy Cross tradition of wellness with premiere services, resources, and education to promote the development of healthy students and to foster campus well-being. Centers, offices, and initiatives that help the unit to achieve its mission include University Health Services, the University Counseling Center, the McDonald Center for Student Well-Being, and the Center for Student Support and Care, which includes both the Care and Wellness Consultants and Sara Bea Accessibility Services.

Career and Professional Development: The Meruelo Family Center for Career Development coordinates career-related services for students as well as prospective employers. Services include career coaching and development, self-assessments, workshops, career fairs, and mock interviews. Students are...
encouraged to begin visiting early in their years at Notre Dame to begin discerning their futures.

Student Development: Student Development encompasses a wide range of departments to support students' growth and formation. Departments include the Office of Community Standards, the Family Resource Center, the Gender Relations Center, Multicultural Student Programs & Services, Notre Dame Bands, RecSports, the Student Activities Office, the Office of Student Enrichment, and Student Media.

Clubs and Organizations. Notre Dame has over 500 student clubs and organizations for interested students, which encompass academic, athletic, cultural, performing arts, social service, and special interest pursuits.

Student Government: The unique blend of elements that gives the Notre Dame community its identity has shaped the character of the student government.

The greatest influence on the student government is the system of residence halls, which not only provides students with a place to live, but also serves as the principal center for social interaction on campus. Each hall has its own government, consisting of a hall president, vice president, cabinet, and judicial board, which works in cooperation with the hall staff to develop the best possible environment for its residents.

The relatively simple structure of the student government has evolved gradually in response to changing attitudes and needs of the student body. At the head of the student government is its chief executive officer, the student body president. Although the duties of the job have tended to vary with the priorities of each officiholder, in general, the president represents the interests of the student body in all areas of life at Notre Dame.

The most representative student government groups are the Hall Presidents' Council and the Student Senate, both of which meet weekly to discuss the various aspects of University life and coordinate activities among the halls and across campus.

The Campus Life Council was created by the University's Board of Trustees to allow for discussion of student conduct set forth in du Lac, A Guide to Student Life. du Lac is available online at dulac.nd.edu.

The University reserves the right to deny the privilege of enrollment to any student whose conduct or attitude is believed to be detrimental to the welfare of the institution.

Intercollegiate Athletics

Since its first athletic contest in 1887, the University of Notre Dame has proudly shouldered the responsibility as a model for intercollegiate athletics. Notre Dame student-athletes today live by the athletic department's five pillars: excellence, education, faith, community and tradition. Not only do the approximately 650 student-athletes across the department's 26 sports excel on the field, in the classroom and in community-centered service efforts, they show their commitment to those endeavors through their displays of faith and of pride in the University. More than 130 years on, Notre Dame student-athletes remain unparalleled in their dedication to shine in all facets of college life.

The University is committed to a well-rounded program for both men and women. The Notre Dame athletic tradition boasts national contenders across 26 varsity sports (13 men's sports and 13 women's sports) and since 2001, the Irish have won national championships in fencing (‘05, ’11, ’17 and ’18), women's basketball (’01 and ’18), women's soccer (’04 and ’10) and men's soccer (’13).

The Notre Dame student body plays an important role in the success of teams that represent the University. Anyone who has attended a football pep rally or seen a top-ranked basketball team upset in the Purcell Pavilion knows why. The pride and loyalty displayed by the Leprechaun Legion are moving forces that embody the spirit of the Notre Dame community. Athletic contests at Notre Dame are an integral part of the social life as well as an opportunity for the athletically gifted to compete against the nation's best.

FACILITIES

Notre Dame Stadium, with its 77,622 seats, has been the home to Irish football since 1930. In the fall of 2017 the University debuted the Campus Crossroads Project, which enhanced fan experience at games as well as brought academic and student life closer to other campus facilities at the University. The project included the addition of a video board in the south end zone and ribbon boards around the east and west sides. Academic buildings connect to both the south, east and west sides of the stadium with premium seating and media accommodations located on the top floors. Installation of an artificial FieldTurf surface was completed prior to the 2014 football season.

Built in 1968, Notre Dame's Joyce Center has been called one of the most complete sports complexes in the country. Not only is there a 9,149-seat basketball/volleyball arena (Purcell Pavilion) but also boxing, weight rooms and multi-use courts in the Fieldhouse. In 2012 the Castellan Family Fencing Center opened inside the Joyce Center Fieldhouse. The new fencing facility includes 15 fencing strips, men's, women's and coaches' locker rooms, a team lounge, conference room and offices. The Rolfs Aquatic Center, with its Olympic-sized swimming pool, completes this complex.

Purcell Pavilion at the Joyce Center opened for the 2009-10 season. The arena was renovated, including the installation of chair-back seating throughout the venue. The construction encompasses a new three-story structure at the south end that includes a lobby, Notre Dame ticket operations, additional area for restrooms and concessions, and the Leep Varsity Shop to sell apparel and souvenirs, in addition to Club Namoli, a club seating and hospitality area.

Rolfs Athletics Hall was recently dedicated on May 8, 2019, as the new state-of-the-art practice complex for the men's and women's basketball programs. One of the largest practice facilities in the country, the 77,000-square-foot building features video rooms, team rooms and locker rooms for both programs, as well as views into both practice gyms on the entry level. The entry level also includes locker areas for coaching and support staff, basketball alumni, practice players and other guests.

The lower level features nutrition space, a sports medicine facility with two in-ground hydrotherapy tubs, a large strength and conditioning center and two separate practice gyms. The upper level includes a shared reception area, office suites for both programs (each with a kitchen and storage space) and two conference rooms suspended above the respective gym spaces.

The University of Notre Dame is enjoying its 15th full season with access to the Guglielmino Athletics Complex, affectionately referred to as “The Gug” (pronounced Goog). 'The Gug houses the football practice-week locker rooms, coaches’ offices and meeting rooms in addition to enhanced sports medicine, strength and conditioning and weight room equipment for all Notre Dame student-athletes.

Underwritten with a gift from the late Don F. Guglielmino and his wife Flora, The Gug provides the Irish football team with a central location for post-practice and pre-practice routines as well as daily positional meetings.

The first floor of the 96,000-square-foot complex features the 25,000-square-foot Haggar Fitness Center (gift of Ed and Patty Haggar, and Joe and Isabell Haggar) with the latest state-of-the-art equipment that all student-athletes can use on a daily basis. The 8,300-square-foot Lofus Sports Medicine and Rehabilitation Center (a gift of John and Julie Lofus) services all Notre Dame student-athletes and
also houses the athletic training staff. Also on the first floor are the Romano Family Locker Room (a gift of D.J. "Buddy" and Florence Romano), lsban Auditorium (a gift from Leonard and JoAnn Isban), the Allen Equipment Room (a gift of Marty and Sue Allen) and Hickey Coaches’ Locker Room (a gift of Jack and Rosemary Hickey).

The second floor houses the Smith Family Office Suites (a gift from the Smith family in honor of Francis W. and Rita C. Smith) with Dick Corbett Head Football Coach Brian Kelly’s area overlooking the LaBar Practice Complex. Eleven banners hang in the Morse Recruiting Lounge (a gift of Jim and Leah Morse) commemorating Notre Dame’s 11 consensus national championships.

Loftus Sports Center is now in its 32nd full year of service at the University of Notre Dame and is one of the most widely used athletics buildings on campus. Designed for use by all Notre Dame athletics teams as well as students, faculty and staff, the center comprises nearly 129,000 square feet and stands tucked in a forested area of campus just north of the LaBar Practice Complex and connected to the Guglielmino Athletics Complex. Dedicated on April 23, 1988, the Loftus Center saw its first football practice on Sept. 30 of that season. The facility is a gift of John R. Loftus, a member of Notre Dame’s basketball team in 1944, 1948 and 1949. The Irish football team practices on Meyo Field (a gift of Raymond D. Meyo), a 100-yard Prestige Turf field complete with end zones.

The Irish Indoor Athletics Center enters its first season of use and is the new home to the indoor practice field of the Fighting Irish football and men’s and women’s soccer teams. Constructed on the site of what is now the western-most field of the Notre Dame football team’s LaBar Practice Complex, the 111,400-square-foot facility was underwritten by gifts from a number of benefactors.

LaBar Practice Complex enters its 12th season of use and is home to the outdoor practice fields of the Fighting Irish football team. A gift of Rees and Carol LaBar, the practice fields are located directly south of the Guglielmino Athletics Complex (on the former site of Moose Krause Stadium and Carrier Field). The LaBar Practice Complex features three football fields, lights, video towers, a maintenance building to provide storage, and is secured with an eight-foot fence. All three practice fields are FieldTurf fields (installed for 2019), allowing the Irish to practice year-round without fear of damaging grass fields due to inclement weather and general wear and tear. The third field is a natural grass field.

Construction of Compton Family Ice Arena, a state-of-the-art, two-sheet ice facility, began in March 2010 south of the Joyce Center. The rink (200’ x 90’) in the main arena (capacity ~5,000) is named in honor of legendary Irish coach Charles W. ‘Lefty’ Smith Jr., while an Olympic-sized (200’ x 100’) auxiliary rink sits on the basement level. The facility includes offices, locker rooms, strength, cardio and other training areas for the Notre Dame hockey program as well as locker rooms, service and support staff and areas necessary to operate campus and community hockey, skating and other recreational ice sport usage. For Irish games and other hospitality functions, O’Brien’s, a club area with adjacent premium seating is available on the mezzanine level. The facility opened on October 18, 2011, and Notre Dame played its first hockey game in the new building on October 21 against RPI.

Notre Dame opened Alumni Stadium, home of the Irish men’s and women’s soccer programs, in 2009. The approximately 3,000-seat facility, which sits side-by-side with the Irish lacrosse facility, Arlotta Stadium, features a natural grass field, fully equipped locker rooms, restrooms and concession areas, an expanded press box and a state-of-the-art light and sound system.

Arlotta Stadium is the home for the men’s and women’s lacrosse programs. Located east of Alumni Stadium, Arlotta features over 2,000 permanent seats with additional seating available on a grass berm opposite of the stands, lights, an artificial turf field, locker rooms, player lounges, press box, restrooms and concession areas. The first event in the new stadium was held October 16, 2009, as the men’s lacrosse team played the Iroquois National team in an exhibition contest. Women’s lacrosse held its first event in the new stadium on March 7, 2010 in a regular-season matchup with Dartmouth.

Frank Eck Stadium, with its 2,500 seats, has been home to Irish baseball since 1994 and has undergone a series of improvements in that time. The clubhouse was remodelled in 2011, before an artificial surface was installed on the playing field in 2014. The program opened its addition of a team room and study lounge in 2017.

Melissa Cook Stadium opened for competition on April 12, 2008. This venue is named in memory of former Irish softball player Melissa Cook. It features a brick/stucco exterior, bluegrass sod outfield, a Daktronics scoreboard with full-color message center, Musco lighting, heated dugouts, home and visitor locker rooms, training room, press box, six batting cages, chair back and bleacher seating, interior restrooms, and concession stand.

The Eck Tennis Pavilion, a 35,000-square-foot structure opened in 1987, is the place on campus for indoor tennis and serves as home for both Irish men’s and women’s tennis teams. Inside are six courts, coaches’ offices, showers and lockers, a repair shop and an observation deck. The pavilion stands adjacent to its outdoor counterpart, the Courtney Tennis Center which features 12 courts for use during the warmer months.

The construction of the new Harris Family Track and Field Stadium was completed in 2018, featuring an existing nine-lane track where the Irish will hold future outdoor meets during the spring competition season. Harris Family Stadium is located southeast of the Joyce Center and features space for throwing and jumping events in two directions and a warm-up area at one end of the track. Among the amenities are men’s and women’s locker rooms, a training facility and a team room, in addition to press box and concession facilities.

Located on the St. Joseph River in downtown South Bend, the 15,000-square-foot McConnell Family Boathouse was dedicated on September 8, 2016. The boathouse features a team room, coach’s lockers and office, varsity locker room, laundry facilities, training room and spectator gallery on the upper level. The lower level includes three boat storage bays, one boat repair bay, boat trailer access, a 144-oar racking system and equipment storage space. A new dock was also constructed for the women’s varsity and the men’s club team to utilize.

### Campus Security and Fire Safety

The safety of all members of the campus community is of paramount concern to the University of Notre Dame. The University publishes an annual report outlining security and fire safety information and crime statistics for campus. This document provides suggestions regarding crime prevention strategies and important policy information about emergency procedures, reporting of crimes, law enforcement services on campus, fire safety, and information about support services for victims of sexual assault. The brochure also contains information about the University’s policy on alcohol and other drugs, the SafeBouND safety escort program and campus shuttle service. You may view the document on the web at: https://police.nd.edu/crime-prevention-and-safety/yearly-security-fire-safety-reports/. A printed copy of this brochure is available by sending an email request to police@nd.edu or by writing to: Office of the Chief, University of Notre Dame Police Department, 204 Hames Mowbray Hall, Notre Dame, IN 46556.

### The Spirit of Inclusion at Notre Dame

“Strangers and sojourners no longer.” (Ephesians 2:19)

The University of Notre Dame strives for a spirit of inclusion among the members of this community for distinct reasons articulated in our Christian tradition. We prize the uniqueness of all persons as God’s creatures. We welcome all people, regardless of color, gender, religion, ethnicity, sexual orientation, social or economic class, and nationality, for example, precisely because of Christ’s calling to treat others as we desire to be treated. We value gay and lesbian members of this community as we value all members of this community. We condemn harassment of any kind, and University policies proscribe it. We consciously create an environment of mutual respect,
hospitality and warmth in which none are strangers and all may flourish.

One of the essential tests of social justice within any Christian community is its abiding spirit of inclusion. Scriptural accounts of Jesus provide a constant witness of this inclusiveness. Jesus sought out and welcomed all people into the Kingdom of God—the gentle as well as the Jew, women as well as men, the poor as well as the wealthy, the slave as well as the free, the infirm as well as the healthy. The social teachings of the Catholic Church promote a society founded on justice and love, in which all persons possess inherent dignity as children of God. The individual and collective experiences of Christians have also provided strong warrants for the inclusion of all persons of good will in their communal living. Christians have found their life together enriched by the different qualities of their many members, and they have sought to increase this richness by welcoming others who bring additional gifts, talents and backgrounds to the community.

The spirit of inclusion at Notre Dame flows from our character as a community of scholarship, teaching, learning and service founded upon Jesus Christ. As the Word through whom all things were made, Christ is the source of the order of all creation and of the moral law which is written in our hearts. As the incarnate Word, Christ taught the law of love of God and sent the Holy Spirit that we might live lives of love and receive the gift of eternal life. For Notre Dame, Christ is the law by which all other laws are to be judged. As a Catholic institution of higher learning, in the governance of our common life we look to the teaching of Christ, which is proclaimed in Sacred Scripture and tradition, authoritatively interpreted by Church teaching, articulated in normative understandings of the human person, and continually deepened by the wisdom born of inquiry and experience. The rich heritage of the Catholic faith informs and transforms our search for truth and our understanding of contemporary challenges in higher education.

This statement was adopted by the officers of the University on August 27, 1997, in conjunction with an Open Letter to the Notre Dame community.

Academic Profile

DEGREES AND ACADEMIC PROGRAMS

The University is organized into four undergraduate colleges, an architecture school, a graduate school of four divisions, a graduate business school, a law school, a school of global affairs, and several graduate research study centers.

In the 2020–21 academic year, there were a total of 8,616 enrolled undergraduate students. The students enrolled in the College of Arts and Letters topped the enrollment figures with approximately 2,636. There were 2,212 students in the Mendoza College of Business, 1,826 students in the College of Engineering, 1,737 students in the College of Science, and 205 students in the School of Architecture. These enrollment figures include the first-year undergraduate students who had been part of an administratively unit known as the First Year of Studies until the 2020–21 academic year.

The College of Arts and Letters offers curricula leading to the degree of bachelor of fine arts in art studio or design and bachelor of arts majoring in:

- Africana Studies
- American Studies
- Anthropology
- Art, Art History, and Design
- Art History
- Art Studio Design
- Classics
- Arabic
- Classics
- Greek
- Latin
- Greek and Roman Civilization
- East Asian Languages & Cultures
- Chinese
- Japanese
- Economics
- Economics
- International Economics—Arabic
- International Economics—Chinese
- International Economics—German
- International Economics—Japanese
- International Economics—Romance Languages
- International Economics—Russian
- English
- Film, Television, and Theatre
- Gender Studies
- German and Russian Languages and Literatures
- German
- Russian
- History
- Irish Language and Literature
- Mathematics (honors only)
- Medieval Studies
- Music
- Neuroscience and Behavior
- Philosophy
- Philosophy/Theology (joint major)
- Political Science
- Program of Liberal Studies
- Psychology
- Romance Languages and Literatures
- French
- Italian
- Romance Languages and Literatures
- Spanish
- Sociology
- Theology

The Mendoza College of Business offers the degree of bachelor of business administration with majors in:

- Accountancy
- Business Analytics
- Business Technology

- Finance
- Management Consulting
- Marketing

The College of Engineering offers curricula leading to degrees of:
- B.S. in Aerospace Engineering
- B.S. in Chemical Engineering
- B.S. in Civil Engineering
- B.S. in Computer Engineering
- B.S. in Computer Science
- B.S. in Electrical Engineering
- B.S. in Environmental Earth Sciences
- B.S. in Environmental Engineering
- B.S. in Environmental Geosciences
- B.S. in Mechanical Engineering

The College of Science offers the degree of bachelor of science majoring in:

- Applied and Computational Mathematics and Statistics
- Biochemistry
- Biological Sciences
- Chemistry
- Chemistry/Business
- Chemistry/Computing
- Environmental Sciences
- Mathematics
- Neuroscience and Behavior
- Physics
- Physics in Medicine
- Preprofessional Studies
- Science–Business
- Science–Computing
- Science–Education
- Statistics

The School of Architecture offers the degree of bachelor of architecture (five-year program).

Supplementary majors may be taken only in conjunction with a full major. The Arts and Letters supplementary pre-health studies major provides students with an opportunity to complete a supplementary major in health-related science. Students may take supplementary majors/minors in departments of other colleges, but their dean may specify certain modifications in their curriculum. Undergraduates may obtain bachelor degrees in combination programs with other colleges in integrated five-year programs.

The course and program requirements for degrees are determined by the various colleges and schools.

These colleges are independent of one another and provide academic instruction within the various programs and departments. The dean of each college has authority, along with the college council, to determine minimum admission standards, requirements for a major and a degree from the program, and dismissal from the college and University.

The student who wishes to transfer from one college to another college within the University must have the approval of the deans of both colleges.
accepting dean has discretion regarding which credits are acceptable toward the degree in the new college.

Dual Degree. A program leading to two undergraduate degrees is distinct from a program in which a student receives one degree with two majors (such as a bachelor of business administration with a major in finance and a major in political science). Students should refer to the dual degree policies which are explained in each college's section of this Bulletin.

Academic Governance. The major source of academic governance within the University is the Academic Council, made up of administrators, faculty, and students from each of the four colleges and chaired by University President Rev. John I. Jenkins, C.S.C. All major decisions concerning academic policy and scheduling throughout the University are made by this board.

Along with the Academic Council, each college is served by a college council representing its faculty and students. The purpose of the council is to suggest and plan academic programs and to make decisions regarding academic policy within the college. Most of the colleges also have a student advisory council whose function is to elicit student ideas and concerns regarding college policy, to formulate those ideas, and to make suggestions to the college council.

Advising. All first-year students enter the First Year of Studies and are assigned an advisor from its faculty. The First Year of Studies offices are located at 219 Coleman-Morse Center. During their first year all students will receive the advising from their First Year of Studies advisor. Students will select the college in which they want to pursue their undergraduate degree by the end of their first year and will be directed to speak with an advisor in their intended college during their sophomore year. Architecture—114 Walsh Family Hall of Architecture; Arts and Letters—104 O'Shaughnessy Hall; Business—101 Mendoza College of Business; Engineering—257 Fitzpatrick Hall; Science—215 Jordan Hall. After a major has been declared, students are assigned a departmental advisor as well.

Pre-Law Advising. Students planning to attend law school may consult with Anita Rees, Center for Career Development.

The Summer Session. Summer courses are offered by the faculty to students at all levels—undergraduate, graduate, and professional.

In addition to meeting the needs of the academic-year students who are continuing work on their degrees, the summer session also serves teachers, industry personnel, and professional and career groups. These students are provided an opportunity to work on advanced degrees, fulfill certification requirements, improve their professional position, or take enrichment courses. The summer session embraces not only the traditional six-week period of course work but also three-week sub sessions.

University Requirements

Application must be made to the University Registrar for a degree.

The receipt of a baccalaureate degree from the University requires satisfactory completion of the undergraduate curriculum including the requirements of the University Core Curriculum. The following new undergraduate Core Curriculum became effective with the first-year students beginning their studies in the 2018–2019 academic year:

Six courses in the liberal arts:

* 1. Quantitative Reasoning
* 2. Science and Technology
* 3. An additional course in Quantitative Reasoning or Science and Technology
* 4. Arts and Literature or Advanced Languages and Cultures
* 5. History or Social Science
* 6. Integration, or a course from an area not yet chosen in 4 or 5

Four courses exploring explicitly Catholic dimensions of the liberal arts:

* 1. A foundational Theology course
* 2. A developmental Theology course
* 3. An introductory Philosophy course
* 4. An additional Philosophy course or a Catholicism and the Disciplines course

Two courses in writing:

1. A University Seminar
2. A Writing and Rhetoric course, or another writing-intensive course.

The two-semester Moreau First Year Experience

* One of these requirements must be designated as a University Seminar course typically numbered as 13180–13189.

(a) Only courses identified as approved “Ways of Knowing” for the University Core Curriculum can be used to fulfill a University requirement.

Approved courses are administratively marked with a “WKxx” identifier in Class Search each semester to denote their approved status as a “Way of Knowing.” These courses can be viewed for a particular academic term by selecting the “Class Search” link within insideND or by visiting the home page of the Office of the Registrar website and clicking on the “Class Search” link.

(b) In addition to these university requirements, each college has its own requirements that must be completed. Without prior permission from the appropriate college dean, special studies and directed readings do not satisfy college requirements.

(c) First-year students are required to complete a University Seminar; the Writing & Rhetoric course; and two one-semester courses for the Moreau First Year Experience. The University Seminar may simultaneously satisfy another university requirement, e.g., a University Seminar offered by the History Department should also satisfy the History requirement.

(d) Satisfactory work in a major or a concentration program of study.

(e) A minimum cumulative average of 2.000.

(f) Completion of a minimum of 50% of the degree credit hours at the University (not less than 60 credit hours) and a minimum of 75% of the degree credit hours (not less than 90 credit hours) must be earned after high school graduation through college and university courses.

(g) Enrollment in the last semester on the main university campus. Under extraordinary circumstances this requirement can be waived by the dean (or the dean’s designee) of the student’s college.

The following principles guide the application of these requirements.

1. All courses approved for the University Core must be at least 2.5 credit hours. In rare circumstances, a maximum of two so-called “mini-courses” (less than 2.5 credit hours) may be reviewed by a Core subcommittee and approved (as a combined set) but only if they form a coordinated and coherent whole.

2. Courses counting toward the University Core must be letter-graded and may not be graded as Satisfactory/Unsatisfactory or Pass/Fail.

3. Transfer students (a) are not required to complete the Core’s University Seminar requirement and (b) may choose to take another approved Writing Intensive course in lieu of the Writing and Rhetoric requirement. Other University Core requirements are not waived for transfer students.

4. At the discretion of the student’s dean or dean’s designee, transfer credits may be accepted for University Core requirements. The student’s dean or dean’s designee typically seeks an appropriate correspondence between transfer courses and approved courses in Notre Dame’s Course Catalog. When no such correspondence exists, transfer courses (and study abroad courses) are vetted by Notre Dame’s academic departments and the Core curriculum subcommittees.

The deans and their designated representatives in each college and school enforce the University Core curriculum standards, and graduation requirement decisions are at their sole discretion.

Central to undergraduate education at Notre Dame is the core curriculum, a set of University required courses intended to provide every undergraduate with a common foundation in learning. Detailed rationales for each requirement can be found at http://corecurriculum.nd.edu/.
Writing. Students will take two writing courses, one of which is a University Seminar. With sufficient placement credit, the student may choose to take a second writing-intensive course instead of Writing and Rhetoric. The Writing and Rhetoric course prepares students to write college-level arguments. Students learn to identify an issue amid diverse and conflicting points of view; frame and sustain an ethical argument that not only includes the analysis and exposition of information but also establishes what is at stake in the issue; provide sufficient and relevant evidence to support their claims; identify and evaluate potential counterarguments; respond thoughtfully to the work of their peers; develop skills for writing a research proposal for conducting original research (e.g., through surveys or interviews) and for using the library's print and electronic information resources; and learn to employ conventions of language in writing academic arguments. A second writing-intensive course may be an elective course with a substantial writing component or a course in the student's major field of study that emphasizes writing skills appropriate to the discipline.

University Seminars. The University Seminar is a distinctive opportunity for every first-year student to experience a small, writing-intensive seminar taught by a member of the University's teaching and research faculty. With a class size of no more than 18, students have the opportunity to regularly engage in class discussions around a particular issue, problem, or topic in a given field of study. Students study the paradigms, content, methodology, or problems of a particular discipline while learning the conventions for academic writing within the parameters or discourse of that field. Each seminar also fulfills one of the University requirements in fine arts, literature, history, social science, philosophy, theology, mathematics, or science.

Quantitative Reasoning. Students develop quantitative reasoning skills through the study of various aspects of mathematics, including analysis, logic, probability and statistics, and modeling. From each of these students derive techniques that are applicable to specific classes of problems. Students will use deductive reasoning in problem solving, apply the inductive process to draw conclusions through quantitative analysis, evaluate data and think probabilistically, assess the strength of numerical evidence, and mathematically model processes or systems to be able to predict (or change) their outcomes. By engaging in multiple mathematical ways of thinking, students will enhance their ability to make informed decisions as citizens and as potential leaders and will gain a deeper understanding of the vital role that Quantitative Reasoning plays in modern society.

Science and Technology. Through the study of science and engineering, students learn how knowledge of the natural world is built on observation, experiment, and evidence, and how these principles can be used to advance technology. They develop a basic understanding of the scientific method and the engineering design process, including an appreciation for the interplay between theory and experiment, and how an advance in one drives the other. In addition to acquiring a working knowledge of fundamental concepts and laws in a particular field of scientific study, students learn to analyze and interpret simple sets of quantitative data and to use mathematical structures to solve problems and create models. Finally, students gain an appreciation of the important interdependence among science, technology, and society.

History. In the study of history, students explore human beings as individuals, groups, nations, or even civilizations in an attempt to comprehend the human experience. Students come to appreciate and understand the processes of continuity and change over time, and they discover how people shaped, altered, or succumbed to their environment or how, in turn, environment channeled historical experience. Thinking critically about the connections between specific events or processes and an array of contingent phenomena, students look for causes and effects, relationships, and relevance.

Social Science. Students discover the diversity of societies and world cultures, the complexity of the choices facing human beings, and the potential social and political consequences of the paths people take. Through lectures, classroom experiences, or local fieldwork, students gain an understanding of the research methods, processes and procedures used to examine human behavior. From the perspective of different social science disciplines, students uncover the competing organizations and institutional opportunities for realizing one's conceptions of justice and the good life.

Theology. Theology, the "science of God," represents "faith seeking understanding." Through the first required course, students arrive at an understanding of the distinctive nature of the discipline of theology; encounter the authoritative texts that serve to constitute the self-understanding of Christian tradition as a response to God's self-revelation; become aware of the constitution, transmission, and interpretation of these texts within the tradition; and, develop their own skills of textual interpretation in conversation with the tradition. Through the second required course, students are introduced to the riches of the Christian theological tradition; develop their theological skills, facilitating the critical retrieval of the Christian heritage; and, come to appreciate better their rootedness in the ongoing tradition of the believing community.

Philosophy. Students engage in logical reflection on the fundamental problems of human existence and prepare to take their place as citizens capable of critically evaluating arguments which bear on public affairs. In the first course in philosophy, students read philosophical texts and identify the main lines of argument and counter-argument, reason about philosophical questions, and defend their own philosophical positions. In the second course in philosophy, students explore a subset of philosophical questions or authors of special interest to them. By studying seminal philosophical texts like those that have contributed to the Catholic tradition and those that have presented challenges to it, students learn to think in depth about the problems posed by a life of faith.

Fine Arts and Literature. Students approach works of art and literature from critical perspectives—as viewers, readers, or listeners—and they apply the analytical tools needed to realize the insights and pleasures that artistic texts and works offer. Students may engage in the creative process, and in so doing gain insights as to how artists interact with their media and how creativity meshes with understanding. The critical analysis of others’ creative practice will enable students to develop the analytical tools to recognize a work’s formal dimensions and its ideas as well as the often-complex interaction between the two. Engagement with artworks will also lead students to reflect on how aesthetic forms of expression help us define ourselves and our world. Analysis of a work of art, be it through its production, through careful interpretation of the work, or through its reception, will lead students to a deeper reflection on how art and society interact, and how artistic expression reflects the position of the artist and the individual with respect to society at large.

Advanced Language and Culture. Exposure to literature, culture, thought, and political discourse in the original language of expression lends both an invaluable insight into the belief patterns of different cultures and a deepening understanding of those beliefs and traditions. Extensive reading, writing, and speaking in a different language requires students to place themselves into the idiom of the underlying culture and its way of thought. Through this intensive engagement with words and ideas, students gain a new perspective on differences of culture and thought, and, ultimately, on their place in a diverse world.

Integration. Integration courses are team-taught by faculty from two departments or academic units and have as a primary goal the pursuit of knowledge that integrates and synthesizes the perspective of two or more disciplines to address an issue of global importance or great existential depth that is too complex to be adequately addressed by a single field of study. In integration courses, students will learn to identify commonalities and differences, as well as strengths and weaknesses, among the various disciplinary perspectives and to devise a more complex approach to the question, problem, or issue that provides the theme for the course. By undertaking an active investigation of a complex topic, students will employ critical thinking and intellectual synthesis, as well as develop habits of inquiry and independent learning.

Catholicism and the Disciplines. Catholicism and the Disciplines (CAD) courses provide a forum where the various lines of Catholic thought intersect with all forms of knowledge and creativity.
found in the university. CAD courses are designed to engage ideas from the Catholic tradition with the perspective of one or more disciplines and to engage issues of faith or normative questions both critically and constructively. Students will become adept at examining faith questions or normative questions critically as they explore Catholic content from the perspective of one or more disciplines, and as they explore topics from the disciplines from a distinctively Catholic perspective. Students will be challenged to defend a position on selected issues of faith or normative questions raised by disciplinary considerations in light of competing alternatives, helping them develop their capacities to think critically and to speak and write effectively about matters of faith in a pluralistic world.

Moreau First Year Experience. This two-semester course sequence helps new students to make a meaningful transition to collegiate life at Notre Dame by integrating their academic, co-curricular, and residential experiences. Through weekly small group discussions, students will explore university resources and opportunities and will examine topics such as: orientation to university life; community standards; health and wellness; strategies for academic success; spiritual life; discernment; and cultural competence.

Graduation Rate

Of the students entering a full-time, first-year bachelor degree-seeking program in the fall of 2013, 96 percent graduated within six years. The complete IPEDS Graduation Rate Survey may be found in the Office of Strategic Planning and Institutional Research. (http://ospir.nd.edu)

Honors at graduation. In the undergraduate colleges, a degree will be granted with highest honors (summa cum laude) if the student's grade point average ranks among the top 5,000 percent of those students graduating from the student's college or school; for a student whose grade point average ranks among the top 15,000 percent of the student's college or school, a degree will be granted with high honors (magna cum laude); for a student whose grade point average ranks among the top 30,000 percent of the student's college or school, a degree will be granted with honors (cum laude). A student who meets the requirements of more than one category of honors will be awarded only the highest honor for which that student qualifies.

Accreditation and Academic Association.
The University of Notre Dame is a member of the North Central Association of Colleges and Secondary Schools, the National Catholic Education Association, the Association of American Colleges, the American Council on Education, the National Commission on Accrediting (not an accrediting agency), the Council of Graduate Schools in the United States, and the Midwest Conference on Graduate Study and Research, and it is fully accredited by the Indiana State Board of Education. The University is also a member of the Indiana Commission on Higher Education.

Grading System

The grading system employed in the evaluation of undergraduate student work is detailed in the Undergraduate Academic Code. The "descriptions" and "explanatory comments" are intended to be sufficiently general to apply across the University, but obviously have to be applied in a manner specific to each department.

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Point Value</th>
<th>Description</th>
<th>Explanatory Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.00</td>
<td>Truly Exceptional</td>
<td>Work meets or exceeds the highest expectations for the course</td>
</tr>
<tr>
<td>A-</td>
<td>3.667</td>
<td>Outstanding</td>
<td>Superior work in all areas of the course</td>
</tr>
<tr>
<td>B+</td>
<td>3.333</td>
<td>Very Good</td>
<td>Superior work in most areas of the course</td>
</tr>
<tr>
<td>B</td>
<td>3.000</td>
<td>Good</td>
<td>Solid work across the board</td>
</tr>
<tr>
<td>B-</td>
<td>2.667</td>
<td>More than Acceptable</td>
<td>More than acceptable, but falls short of solid work</td>
</tr>
<tr>
<td>C+</td>
<td>2.333</td>
<td>Acceptable: Meets All Basic Standards</td>
<td>Work meets all the basic requirements and standards for the course</td>
</tr>
<tr>
<td>C</td>
<td>2.000</td>
<td>Acceptable: Meets Most Basic Standards</td>
<td>Work meets most of the basic requirements and standards in several areas</td>
</tr>
<tr>
<td>C-</td>
<td>1.667</td>
<td>Acceptable: Meets Some Basic Standards</td>
<td>While acceptable, work falls short of meeting basic standards in several areas</td>
</tr>
<tr>
<td>D</td>
<td>1.000</td>
<td>Minimally Passing Work</td>
<td>Work just over the threshold of acceptability</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>Failing</td>
<td>Unacceptable performance</td>
</tr>
<tr>
<td>X</td>
<td>0</td>
<td>Failing</td>
<td>Given with the approval of the student's dean (or the dean's designee) following the last day for course discontinuance, per the Undergraduate Academic Code.</td>
</tr>
<tr>
<td>W</td>
<td></td>
<td>Discontinued with permission</td>
<td>Discontinued with permission of the student's dean (or the dean's designee) following the last day for course discontinuance, per the Undergraduate Academic Code.</td>
</tr>
<tr>
<td>NR</td>
<td></td>
<td>Not Reported</td>
<td>Final grade(s) not reported by the instructor because of extenuating circumstances. No final grade reported for the course. It will revert to an “F” if not resolved by the beginning of final week in the next semester for which the student is enrolled.</td>
</tr>
<tr>
<td>F*</td>
<td></td>
<td>Not Reported</td>
<td>No final grade reported for an individual student. Assigned when the instructor has failed to report a grade for either an individual student or an entire class. It reverts to “F” if not changed within 30 days after the beginning of the next semester in which the student is enrolled.</td>
</tr>
<tr>
<td>P</td>
<td></td>
<td>Pass (Pass/Fail Option: Junior or senior undergraduates may file with their academic dean [or the dean's designee], during the first six class days of the semester, the decision to take on a pass/fail basis one course per semester. Policy details are outlined in the Undergraduate Academic Code.)</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td></td>
<td>Satisfactory work</td>
<td>Research courses, departmental seminars, colloquia or directed studies; workshops; field education and skill courses.</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td>Unsatisfactory work</td>
<td>Research courses, departmental seminars, colloquia or directed studies; workshops; field education and skill courses.</td>
</tr>
</tbody>
</table>

The following letter grades may be given, but are not included in the computation of a student's Grade Point Average.
Conference of Higher Education, the International Association of Universities, the Catholicarum Universitatum Foederatio (Federation of Catholic Universities) and the Institute of International Education.

Academic Code of Honor

The University of Notre Dame is a scholarly community in which faculty and students share knowledge, ideas, and creative works. Notre Dame's Academic Code of Honor expresses our common commitment and moral responsibility to represent accurately and to credit the contributions of every individual.

The Procedural Appendix to the Undergraduate Academic Code of Honor (honorcode.nd.edu) describes the standards of personal academic conduct that all Notre Dame undergraduates pledge to follow and also outlines the set of procedures by which violations of the Honor Code are reported and adjudicated.

Before matriculation, each entering student must pledge:

As a member of the Notre Dame community, I acknowledge that it is my responsibility to learn and abide by principles of intellectual honesty and academic integrity, and therefore I will not participate in or tolerate academic dishonesty.

The Undergraduate Academic Code

The Undergraduate Academic Code governs the attainment of academic credit and degrees by undergraduate students at the University of Notre Dame. The Academic Council of the University ratifies and retains both authority and responsibility for review and amendment of the Code. Its administration and interpretation fall under the aegis of the Officers, the Deans, and the Registrar of the University. A copy of the Undergraduate Academic Code can be found online at http://provost.nd.edu/information-for-faculty/faculty-handbook-academic-codes/.

Notre Dame NetID Student Policy

The University of Notre Dame NetID accounts and related services are intended for faculty, staff, and currently enrolled students. "A student must register and enroll at the dates and times announced by the Registrar." (Academic Code 4.1) A student who fails to enroll by the announced date will forfeit his or her right to access his or her NetID account and related services. University computing resources supplied by way of the NetID are normally available to a student for up to 60 days after his or her graduation date. A student granted a leave of absence would normally retain access to University computing services for up to two semesters. A student who is separated from the University due to an academic suspension, academic dismissal, or withdrawal will no longer have access to University computing services, unless an extension has been approved by the dean of his or her college. A student attending Notre Dame for the summer only, with a non-degree seeking status, will normally retain access to University computing service for up to 60 days after the August graduation date. A student who is separated from the University for other reasons will no longer have access to University computing services.

Hesburgh Libraries

The Hesburgh Libraries is a diverse system featuring a main library that houses specialty libraries and three branch libraries located throughout the Notre Dame campus. In an effort to further its core mission of “connecting people to knowledge,” the Libraries offer a vast array of expertise, services, resources and spaces to ensure the academic success of the student community. Whether through the expertise of subject librarians and specialty services or the access to various sources of knowledge, we continuously evolve to meet the ever-changing needs of Notre Dame students in the 21st century.

We often hear students say, “If only I had known sooner how much help I could get from the Libraries...” Jose A. and Lelia B. Vargas Library opened in 1963 as “Memorial Library” and was one of the largest collegiate libraries of its day. Home to many core services and resources as well as reference and subject librarians, the Hesburgh Library continues to serve as the flagship building of the Hesburgh Libraries system here at Notre Dame. In addition to the general research collections on open stacks, three specialty Libraries and Centers reside within the Hesburgh Library building:

- Hesburgh Library
  (574) 631-6679
  library.nd.edu
- Medieval Institute Library
  7th Floor, Hesburgh Library
  (574) 631-5724
  library.nd.edu/medieval
- Navari Family Center for Digital Scholarship
  2nd Floor NE, Hesburgh Library
  (574) 631-4900
cds.library.nd.edu

Rare Books and Special Collections
102 Hesburgh Library
(574) 631-0290
rarebooks.library.nd.edu

University Archives
607 Hesburgh Library
(574) 631-6448
archives.nd.edu

Branch Libraries. Library services have expanded beyond the building adorned with the Word of Life mural to include three branch libraries:

- Architecture Library
  150 Walsh Family Hall of Architecture
  (574) 631-6654
  library.nd.edu/architecture
- Mahaffey Business Library
  L001 Mendoza College of Business
  (574) 631-9098
  library.nd.edu/business
- O'Meara Mathematics Library
  001 Hayes-Healy Center
  (574) 631-7278
  library.nd.edu/mathematics

Subject Librarians. More than 50 Subject Librarians and liaison librarians provide invaluable expertise and support services for the teaching, research and scholarship initiatives of the University community. library.nd.edu/subjects. Services offered by Subject Librarians include research consultations, materials purchase requests, and library instruction. They are responsible for collection development and management in one or more subject areas, including selection, communication with subject department faculty, de-selection, and preservation. Subject Librarians are also your liaison to specialty research services within the Hesburgh Libraries and throughout the campus community. Begin your student career at Notre Dame by initiating and building a relationship with your Subject Librarian as soon as possible. You can connect face-to-face, by email, phone or chat.

Using Notre Dame Email

The University of Notre Dame uses its email system as the official means to communicate important information to students. Students are expected to check their email regularly and are responsible for reviewing the information and responding to any inquiries or action items that they receive via email. This is particularly important as traditionally paper-based processes are increasingly replaced by electronic communications. Further details about the University of Notre Dame’s management of email can be found online at https://oit.nd.edu/services/email-calendaring/.

To Table of Contents
First Year Experience Librarian. The Hesburgh Libraries has exceptional librarians dedicated to helping first-year students learn more about what it means for a college student to have information literacy. Information literacy is knowing how to: access information efficiently and effectively, evaluate information critically and competently, and use information appropriately for different purposes in a variety of contexts. Ultimately, this first year training helps students succeed in their academic work and in the world beyond Notre Dame.

Navari Family Center for Digital Scholarship. The Navari Family Center for Digital Scholarship is located in Hesburgh Library's northeast corner on the 2nd floor. The Center (CDS) leverages state-of-the-art technologies, enabling students and faculty to explore new methodologies, analyze complex data and share research results in ways never before possible. The Center is nimble, capable of rapidly adopting new technologies as they emerge—transforming how teaching, research and scholarship are performed here at Notre Dame.

With partnerships campus-wide, the Navari Family Center for Digital Scholarship serves as a “hub” that enhances the teaching, learning, and research process in every academic discipline. The Center empowers and equips our next generation of scientists and scholars to accelerate their research process, create new knowledge in a digital environment, and make a more profound impact in the world.

Center Expertise. The Center offers cross-disciplinary library expertise, including a GIS Librarian, Data Analysis Librarian, Digital Humanities Librarian, and a Digital Initiatives Librarian. Subject Librarians are also important contributors to and conduits for the Center’s impact. To meet specialty needs, The Center has developed partnerships with various campus research providers, such as the Center for Research Computing, the Center for Creative Computing, and the Office of Research. Our structure ensures that areas of expertise will evolve to meet the changing demands of our University community for research and scholarship in the 21st century.

Center Services. Current services include GIS (Geographic Information Systems) Consultation, Data Usage and Analysis, Text Mining and Analysis, Research Data Services, Metadata Services, Copyright Services, 3D and Large Format Printing, and Referral Services. Workshops and introductory topic sessions will be available on a regular and recurring basis, or by request.

Interlibrary Loan. Interlibrary Loan (ILL) is a complimentary service for ND students that procures from other libraries research materials not available in the University’s collection. Delivery of electronic materials is provided through your ILL account interface—be sure to take time to create your Interlibrary Loan account to ensure service when you need it.

Document Delivery. Document Delivery is a service that can be used to retrieve materials from any of our collection locations for delivery to your preferred library location for pickup at service desks at any of the above locations. Articles are delivered via email unless you indicate a preference for paper copies; paper copies are delivered to the service desk of your choice within the Hesburgh Libraries system.

Senior Thesis and Capstone Camp. Thesis Research and Writing Camps are designed to provide structured and supported time for you to focus on your research output. The camps are 5-day events offered during fall midterm break. Meals are provided to allow your time and attention to be focused upon learning new research and writing techniques, applying time management tips, meeting members of your student community, exchanging ideas, and building your community beyond your own discipline.

University of Notre Dame Library Research Award. The award honors undergraduate students at every level who demonstrate excellent research skills and who incorporate library services, resources and expertise into their scholarly works and creative projects. There are different levels and cash awards. For more information on how to apply and tips for submissions at library.nd.edu/library-research-award.

Writing Center Consultations. The Libraries feature an on-site partnership with the Writing Center. The Writing Center has evening hours within the Hesburgh Library Sunday—Thursday during the regular academic year.

Additional Services. In the Libraries we provide access to overhead and flatbed document scanning; ask-a-librarian online, email and chat services; remote access to research materials such as electronic books, journals and databases.

Academic Resources

Faculty. In 2019–20, Notre Dame’s instructional faculty numbered 1224 full-time and 172 part-time. Other faculty, such as administrative, professional specialists, librarians, and research fellows, numbered 259 full-time and 13 part-time. Ninety percent of the full-time instructional faculty have terminal degrees; 92 percent of them have doctorates. Ninety-eight percent of the full-time instructional faculty are lay persons. (The faculty to student ratio is 1:10.)

Institutes and Centers

Requiring approval by the Office of the Provost and organized according to their size and scope of operations, the diversity of Notre Dame’s institutes and centers provides a wide range of venues for collaborative research and support for faculty and students. Details can be found online at https://www.nd.edu/academics/centers-and-institutes/.

The University Institutes at Notre Dame include the Ansari Institute for Global Engagement with Religion, Center for Social Concerns, Eck Institute for Global Health, Institute for Educational Initiatives, Kellogg Institute for International Studies, Kroc Institute for International Peace Studies, Liu Institute for Asia and Asian Studies, McGrath Institute for Church Life, Medieval Institute, Nanovic Institute for European Studies, Notre Dame Radiation Laboratory, Tantur Ecumenical Institute, and W. M. Keck Center for Translational Research.

The University Research Centers at Notre Dame include the Boalt-Parseghian Center for Rare and Neglected Diseases; Kroc Institute for Civil and Human Rights; Center for Informatics and Computational Science; Center for Theology, Science, and Human Flourishing; Interdisciplinary Center for Network Science and Applications; ND Energy; and Fitzgerald Institute for Real Estate.

The College Institutes at Notre Dame include the Environmental Research Center (UNDERC), Harper Cancer Research Institute, Institute for Flow Physics and Control, Institute for Latino Studies, NDnano—Center for Nano Science and Technology, and Wireless Institute.

The College Centers at Notre Dame include the Center for Accounting Research and Education (CARE), Center for Astrophysics (CANDU), Center for Environmental Science and Technology, Center for Ethics and Culture, Center for Ethics and Religious Values in Business, Center for Mathematics, Center for Philosophy of Religion, Center for Research on Educational Opportunity, Center for Stem Cells and Regenerative Medicine, Center for STEM Education, Center for the Study of Religion and Society, Center for the Study of Social Movements, Cusack Center for the Study of American Catholicism, Eugene D. Fanning Center for Business Communication, Institute for Structure and Nuclear Astrophysics (ISNAP), Institute for Theoretical Sciences, John J. Reilly Center for Science, Technology and Values, Notre Dame Dolelith Center for Ethical Leadership, Notre Dame International Security Center, QuarkNet Center, Rooney Center for the Study of American Democracy, Ruth M. Hillebrand Center for Compassionate Care in Medicine, Warren Family Research Center for Drug Discovery & Development, William J. Shaw Center for Children and Families, and Wilson Sheehan Lab for Economic Opportunities.

Other academic support units include the Center for Creative Computing, Navari Family Center for Digital Scholarship, Center for Research Computing, Center for Social Science Research, Center for the Study of Languages and Cultures, Chemical Synthesis and Drug Discovery Core Facility, Engineering and Design Core Facility, Flatley Center for Undergraduate Scholarly Engagement, Genomics and Bioinformatics Core Facility, Institute for Scholarship in the Liberal Arts, Kanbe Center for Teaching and Learning, Magnetic
Academic Resources


Notre Dame Research. At the University of Notre Dame, record-breaking research awards of more than $180 million have paved the way for new discoveries, unlocked knowledge, and improved technologies. Notre Dame Research is committed to supporting a culture of research, scholarship, and creative endeavor throughout campus, in order to help the University be a repository for knowledge and a powerful means for doing good in the world.

NDR provides support to these researchers in various aspects of research activity including administration and compliance. In addition, NDR supports and encourages innovation in more than 20 world-class core facilities and resources, as well as in a number of key areas of research, including cancer, environmental change, global health, and many more.

At Notre Dame, more than one-third of undergraduate students participate in original research with a faculty mentor. The University’s low student-faculty ratio means that students from all Colleges and Schools are right alongside Notre Dame’s leading researchers as they conduct groundbreaking research in the field, on the bench, or at the policy table. In addition, students have the opportunity to pursue funding for independent research and creative projects through a number of organizations that can be conducted on campus and abroad.

More information regarding Notre Dame Research can be found at research.nd.edu or by following @UNDResearch on Twitter.

IDEA Center. Standing for Innovation, De-Risking and Enterprise Acceleration, the IDEA Center is the fundamental resource for all commercialization and student entrepreneurial activities at the University of Notre Dame. Comprised of the Commercialization Engine (formerly the Office of Technology Transfer), Innovation Park, Network Engagement, and Student Entrepreneurship, it provides the necessary space, services and expertise for idea development, commercialization, business formation, prototyping, entrepreneurial education, and student entrepreneurial efforts. It is designed to bring the best Notre Dame faculty, staff, and student ideas and innovations to market. Learn more at ideacenter.nd.edu.

Snite Museum of Art. The museum features international collections and a sculpture park that place it among the finest university art museums in the nation.

The Mesoamerican collection includes fine examples of early Mexican, Central, and South American cultures and is considered among the finest in the U.S.

The Kress Study Collection has Italian Renaissance panel paintings and the Baroque collection contains works by Bloemaert, Coypel, and van Ruisdael.

Selections from the Feddersen Collection of over 70 notable Rembrandt van Rijn etchings are exhibited frequently; and the 18th-century collection includes such masters as Boucher, Vigée-LeBrun, Reynolds, de Mura, and West.

The critically acclaimed John D. Rockefeller Collection of Old Master to 19th-Century Drawings includes examples by Tintoretto, Tiepolo, Oudry, Ingres, Fragonard, Géricault, Millot, and Degas. The Noah and Muriel Burton Collection of 19th-Century French Art is one of the museum’s major strengths, with paintings and drawings by Corot, Boudin, Couture, Courbet, and Gérôme.

The Ashbaugh Decorative and Design Arts Gallery spans the 18th through 20th centuries and exhibits early porcelains from Sévres and Meissen. Exceptional ceramics, furniture, glass, and silver pieces represent both the Arts and Crafts and Art Nouveau styles of the 19th century in addition to the Art Deco and Bauhaus modern movements. Twentieth-century-designed pieces by Wright, Stickley, and Hoffman are also on view.

The Janos Scholz Collection of 19th-Century European Photography contains some 5,500 images of persons and places taken during the first 40 years of camera use. The photography collection extends to the present day and is considered one of the finest in an academic museum.

Native American art focuses on early 19th-century, Plains Indian-painted war records and costumes; it also features Mimbres- and Anasazi-painted ceramics from the prehistoric Southwest.

The American Art collection has 19th-century landscapes by Durand and Inness and portraits by Eakins, Sargent, and Chase. Among highlights of the West and the Southwest regions are paintings by Higgins, Ufer, and Russell.

Traditional works of African art such as textiles, masks, and sculptures are in the collection as well.

Twentieth-century styles and movements are seen in paintings by Miro, O’Keeffe, Avery, Glackens, Pearlstein, and Scully. Modern sculptures by Barlach, Zorach, Cornell, and Rickey complement the paintings and drawings.

Croatian-American sculptor Ivan Mestrovic, who taught at Notre Dame from 1955 until his death in 1962, created many works displayed throughout campus. Major pieces can be seen in the museum, the Eck Visitors’ Center, and the Basilica of the Sacred Heart.

There are ten permanent collection museum galleries open throughout the year, plus four galleries for special exhibitions such as the exhibition of art by MFA degree candidates.

The Snite Museum offers a wide range of interpretive programs including gallery talks and conversations about art, wellness programs like yoga and meditation, art-making workshops, concerts, lectures, and performances. Students can become more deeply involved in the Museum through opportunities like PhotoFutures, the student collecting group that acquires contemporary photography for the Museum; the Student Advisory Group, which helps connect the Museum to the student body; and the Gallery Teaching Program, in which undergraduate students learn to teach undergraduate classes that visit the Museum.

More information about the Museum’s collections and programs is available by visiting sniteartmuseum.nd.edu.

Admission

This year we expect more than 20,000 students will apply for admission to Notre Dame’s entering class. Most of the applicants will have the academic aptitude and preparation necessary to complete a degree program at the University. The Committee on Admissions will decide which applicants will be among the 2,000 included in the class. To understand how this is done, it is first necessary to know the procedure for applying to Notre Dame.

ACADEMIC PREPARATION

Most applicants will have taken and successfully completed the most challenging program of studies available in their high schools. We strongly recommend a curriculum including four years each of English, mathematics, science, history, and foreign language.

All successful applicants are admitted to the First Year of Studies. However, entrance requirements differ slightly for students planning to pursue studies in science and engineering. Sixteen units are required of all students as described below.

For students intending to choose a major in the College of Arts and Letters or the Mendoza College of Business, excluding the Arts and Letters Prehealth or Neuroscience and Behavior program and the combined Arts and Letters/Engineering program, the 16 units must be distributed as follows:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4</td>
</tr>
<tr>
<td>Algebra, advanced algebra</td>
<td>3</td>
</tr>
<tr>
<td>Trigonometry, and geometry</td>
<td></td>
</tr>
<tr>
<td>Foreign language</td>
<td>2</td>
</tr>
<tr>
<td>History</td>
<td>2</td>
</tr>
<tr>
<td>Science</td>
<td>2</td>
</tr>
<tr>
<td>Additional English, mathematics, science, history, social studies, and language courses</td>
<td>3</td>
</tr>
</tbody>
</table>

For students intending to major in the College of Science, the College of Engineering, the School of Architecture, the Arts and Letters Prehealth or Neuroscience and Behavior program or the combined Arts and Letters/Engineering program, the distribution must be:


English 4
Algebra, advanced algebra, trigonometry, and geometry 3
Advanced mathematics (calculus or precalculus) 1
Foreign language 2
History 2
Chemistry 1
Physics 1
Additional English, mathematics, science, history, social studies, and language courses 2

The unit is the credit for a year of satisfactory work in an accredited secondary school. The two language units required must be in the same language. In some cases, the Committee on Admissions waives the foreign-language requirement.

APPLICATION PROCESS

First-year students are admitted to the University of Notre Dame for only the fall semester of each academic year. A student who wishes to be considered must have the following items on file: (1) a completed application, (2) an official high school transcript, (3) a letter of evaluation from a secondary school teacher and (4) an official report of scores on the SAT or ACT.

Application. The application is a student’s opportunity to tell the Office of Undergraduate Admissions about him or herself. Applicants are advised to include any information about their personal and academic circumstances that may give the Committee on Admissions a more holistic view of their attributes.

The University of Notre Dame is a member of the Common Application and the Coalition Application. Prospective first-year students can access the online application and writing supplement at www.commonapp.org or www.coalitionforcollegeaccess.org, and may register for an account beginning August 1.

High School Transcript. Your high school must submit an official copy of your transcript, including a listing of your senior-year courses.

Evaluation. The Office of Undergraduate Admissions requires two letters of evaluation from every applicant. We do not encourage additional letters of recommendation. Your guidance counselor will complete a counselor evaluation, which helps us gauge your performance in your high school environment. Usually guidance counselors will include a short personal letter of evaluation. It will assess your performance in class as well as your character and personality. You may choose any high school teacher to write your letter of evaluation, as long as he or she has taught you in an academic subject area (math, science, English, social science, or foreign language) and knows you well.

Testing. All applicants are required to take the SAT or ACT. The test results are part of the evaluation process for admission. You must take one of these tests no later than January of your senior year.

The College Board code for the University of Notre Dame is 1841, and the ACT code for Notre Dame is 1252.

If you have taken other standardized tests (SAT Subject Tests, AP, IB, TOEFL), please include the results with your application. We will use these scores as supplementary information, although they cannot be used in place of the SAT or ACT.

Anyone who wishes to continue the study of French, German, Italian, or Spanish at Notre Dame can take the SAT Subject Test in that language. The results will be used for placement purposes.

Students enrolled in home-school programs or in high school programs that substitute certification of competencies for grades must take three SAT Subject Tests: science, history, and foreign language.

DECISION AND NOTIFICATION PLANS

Students seeking admission to Notre Dame's entering class must choose to have their applications reviewed under one of two procedures.

Restrictive Early Action: November 1
Notre Dame has a Restrictive Early Action program.
• A student applying Restrictive Early Action to Notre Dame may apply to other Early Action programs.
• A student applying Restrictive Early Action may not apply to any college or university that has a binding Early Decision program.
• Students do not indicate a first-choice preference by applying early, and still may wait until May 1 to indicate their decision to attend.

Students who apply in the Restrictive Early Action process receive an admissions decision before Christmas. Three decisions are possible:
• Admission to the University
• Denial of admission to the University
• Deferral of decision until Regular Decision

Students admitted to Notre Dame have until the May 1 deadline to decide whether they would like to confirm their attendance at the University. If a student is denied admissions in Early Action, then the process ends and he/she cannot apply later during the Regular Decision process. If a student is deferred, the Admissions Committee has decided to review the application further in the Regular Action process, and so “rolls over” the application to Regular Decision.

Because the Admissions Committee is unable to extend all of its offers of admission in the Restrictive Early Action process, it is highly conservative when making Early Action admission decisions. The Admissions Committee advises students to apply in the Restrictive Early Action process only if they are in the very top ranges of our applicant pool.

Further clarification of Restrictive Early Action standards for this year can be gained by seeing the Admissions Counselor who may travel near your area in the autumn or by contacting the Office of Undergraduate Admissions at admissions@nd.edu.

Regular Decision: January 1
The Regular Decision process at Notre Dame is also non-binding. Three decisions are possible following the Regular Decision process:
• Admission to the University
• Denial of Admission to the University
• Waitlist

Students will receive one of these decisions by the beginning of April and, if admitted, are required to send in a confirmation card and deposit by May 1. Students who are denied admission to the University may choose to attend another four year institution for one or two years and then apply to Notre Dame as a transfer student.

Waiting List. Some applicants will be notified that they have been placed on a waiting list and will receive a final decision during the period of mid-May to mid-June. If placed on the waiting list, you should make plans to attend another institution because we cannot predict how many applicants will gain admission from the waiting list in a given year. Students admitted from the waiting list have two weeks to submit a $500 advance payment, confirming their intention to enroll in the first-year class.

The Campus Visit. We welcome visits from prospective applicants. Our staff members meet with groups of students and parents to discuss admissions policies and procedures, degree programs, student life, financial aid, and other topics of interest.

Information Sessions are available from March through early December. Information Sessions for Saturday morning are available from early September to late April. Register online at least two weeks in advance of your visit. Campus Tours are available following Information Sessions when classes are in session and on most weekdays of the summer. Information Sessions and Campus Tours may be scheduled online at admissions.nd.edu/visit/.

The Office of Undergraduate Admissions is closed on certain holidays and holiday weekends.

THE SELECTION PROCESS

Notre Dame seeks to enroll intelligent, inquisitive, energetic, and compassionate students who will bring a diversity of talents and backgrounds to our campus. In selecting the class, the Committee on Admissions evaluates thoroughly each applicant’s personal and academic credentials.

Academic Achievement. In evaluating a student’s academic achievement, the Committee on Admissions considers a student’s curriculum, class rank, concentration of talent in the high school, test scores, teacher evaluation, and essays. Most students admitted to Notre Dame have taken the most demanding courses available, rank among the top students in their schools, and have done quite well...
on standardized tests. We could cite the average rank and median test results of our admitted students, but a listing of such numbers is often misinterpreted. Each year, some applicants with high test scores and class rank are not admitted while some students with less impressive numbers are selected for admission based on their other outstanding academic and personal accomplishments.

**Personal Qualities.** The lifeblood of Notre Dame resides in its people: faculty, staff, and students. Each potential student’s application is studied to determine what talents, skills, and interests that person might offer Notre Dame’s community. We have a strong interest in people who can make unique contributions and will share their talents with us—talents as musicians, writers, technicians, tutors, athletes, artists, volunteer workers, actors, organizers, thinkers, conversationalists, poets, or dancers. There is need in each freshman class for a variety of talents and personalities. The listing of activities, written statements, and evaluations gives us a view of the person represented by the application. It is important to present talents and intellectual interests on the application form.

**MENDOZA COLLEGE OF BUSINESS**

Applicants who indicate an intent to major in business will be informed, at the time of admission, whether they are “pre-approved” to do so at the end of their first year, should that remain their goal. If they are not pre-approved, students will be advised that they will be free to enroll in any other college or school, but that the chances of being approved to major in business after the first year will be extremely limited. Such students will be advised that they should reconsider enrolling in Notre Dame if they are only interested in majoring in business. If a student who is pre-approved to major in business later decides not to do so, she or he will be free to major in any other college or school at Notre Dame.

**STUDENTS WITH DISABILITIES**

Each year Notre Dame admits a number of academically talented students with various disabilities. Once enrolled here, students with disabilities may use a variety of services intended to reduce the effects that a disability may have on their educational experience. Services do not lower course standards or alter essential degree requirements but instead give students an equal opportunity to demonstrate their academic abilities. Students can initiate a request for services by registering with the Sara Bea Center For Students With Disabilities (OSD) and providing information that documents his or her disability. Individual assistance is provided in selecting the services that will provide access to academic programs and facilities of the University.

OSD provides services to students with mobility, hearing, or visual impairments, as well as students with learning disabilities. The services that are typically used include alternative formats of textbooks, modifications in the way students take exams, and readers, note takers, and academic aides. The University maintains accessible rooms in nine residence halls for students with physical disabilities.

All Notre Dame students must supply the necessary initiative and determination to discover and utilize the available campus resources. Students with disabilities will find that a truly creative ability to solve daily problems may be as important to success as developing alternative skills through academic experience. We invite admitted applicants to visit Notre Dame and become familiar with the facilities here before making a final college choice.

For more information, contact the Sara Bea Center For Students With Disabilities at 574-631-7173 or 574-631-7173 (TTY).

**INTERNATIONAL STUDENTS**

Notre Dame welcomes students from around the world. International students enhance the cultural and intellectual atmosphere of our community.

The admissions process for international students who are not Permanent Residents of the United States differs slightly from the process for U.S. citizens. To complete an application, an international student must submit a Certificate of Finances. This document is provided on our website: [http://financialaid.nd.edu/prospective-students/applying/international-students/](http://financialaid.nd.edu/prospective-students/applying/international-students/). Additionally, as English proficiency is critical to a student’s academic success at the University, students who do not speak fluent English must take the Test of English as a Foreign Language (TOEFL) or IELTS. The SAT or the ACT is also required for admission. Students who have difficulty locating a test center that administers the SAT or ACT should contact the American Embassy or an American school in their area.

International students wishing to apply for our limited need-based financial assistance must complete both the Certificate of Finances and a CSS Foreign Student Aid Application. Based upon a review of academic credentials, financial need, and availability of scholarship resources, a student may be considered for financial assistance. Financial aid packages may include student loans, student employment, and University scholarship assistance.

**TRANSFER ADMISSION**

Some students are admitted to Notre Dame with advanced standing. If you wish to apply for admission as a transfer student, you must have obtained the equivalent of at least 27 semester hours of transferable credit, and maintained a cumulative “B” average in all courses. (The competition is such that the average GPA for admitted students is significantly higher.) The committee gives strong preference to applicants who have completed Notre Dame’s first-year course requirements. Online courses, distance-learning courses, USAFI courses, and credits earned through the College Level Examination Program (CLEP) are not transferable.

To be eligible for an undergraduate degree, you must complete a minimum of 50% of the degree credit hours at the University (not less than 60 credit hours) and a minimum of 75% of the degree credit hours (not less than 90 credit hours) must be earned after high school graduation through college and university courses. Please consult the Academic Code for details.

As a transfer applicant you must provide the Office of Admissions with (1) a completed application form, (2) an official transcript from each college attended along with course descriptions, (3) a final high school transcript, (4) an official SAT or ACT score, and (5) college official report.

If you are interested in transferring to Notre Dame, please note that we cannot guarantee on-campus housing to transfer students. Off-campus housing close to the University is available; students are offered campus accommodations from a waiting list if rooms become available.

You must submit your transfer application for the fall semester by March 15. The Transfer Admissions Committee will notify you of its decision between June 1 and July 1.

The deadline for the spring semester is November 1. The committee will notify you of its decision between December 1 and January 5.

The University of Notre Dame uses the Common Application for transfer applicants. An application overview and a link to the online Common Application can be found at [admissions.nd.edu](http://admissions.nd.edu).

**Fees and Expenses**

In the undergraduate colleges, the University is essentially a residence school for full-time students. As many students as accommodations will allow are housed in the campus residence halls. First-year students are obliged to live on campus. Permission to live off campus must be obtained from the dean of students. The fees listed below are for the academic year 2020–21 and are subject to change according to factors operating within the economy that affect universities as well as the country as a whole.

**Campus Resident Student.** The basic fee for the academic year 2020–21 is $36,841.50 per semester. This fee entitles the student to instruction and tuition for the semester; meals in the University dining halls; a room in a residence hall; the use of the general library and the departmental libraries; admission to many lectures, concerts, and entertainment in Washington Hall and DeBartolo Performing Arts Center; the use of the Rockne Memorial, the Joyce Center, the Smith Center for Recreational Sports, the athletic fields, and the University golf course (there is a nominal fee for the use of the golf course); a copy of each issue of the [Scholastic](http://www.scholastic.com) (the
news magazine of the University) and a copy of the Dome (the yearbook of the University) in the second semester.

Off-Campus Student. The tuition and fees for the full-time off-campus student is $28,849.50 per semester for the academic year 2020–21, which entitles the student to instruction for the semester and those things listed above under the total fee for the campus resident student. For the off-campus student requiring board and lodging at the University, Health Services in time of illness, there is a daily charge.

Part-Time Undergraduate Student. An undergraduate degree-seeking student must be in full-time status each semester. Any undergraduate student who is enrolled in at least 12 credit hours is considered full-time. A student who believes that special circumstances may require him or her to carry fewer than 12 semester hours in any semester (including a senior in his or her last semester) must seek approval to be part-time from his or her respective college. This request and conversion, if approved, must be made before the sixth class day of a fall or spring semester. If permission is granted, the dean will notify the Office of Student Accounts of the change of status and an adjustment to tuition will be made if necessary. There will be no charge.

Undergraduate Fees.
• Technology Fee: $125 per semester.
• Health Center Access Fee: $75 per semester.
• Student Activity Fee: $47.50 per semester.
• Observer Fee (daily student newspaper): $6 per semester.

The above fees do not cover the cost of textbooks, stationery, etc., which is estimated at $1,050 per year for the average undergraduate student.

The technology fee provides partial funding for the University's enterprise-wide technology infrastructure, which provides all students access to the Internet, e-mail, courseware, campus clusters, and a wide array of the latest software. This fee provides for the growth in student services, such as course and degree requirements, Web Registration, and value-added Internet related capabilities.

The health center access fee provides students access to all services at the University Health Center and University Counseling Center, including 24-hour medical assistance and counseling/mental health assistance, alcohol and drug education programs, and health-education and wellness programs. This fee provides partial funding to address increasing student health and wellness needs, along with funding to maintain health facilities.

Student Accident and Illness Insurance Plan. To assist in financing any medical or hospital bills, a student health insurance plan is available to students.

Notre Dame requires all international students to have health insurance coverage comparable to the University Plan; therefore, they are automatically enrolled and charged for the student health insurance plan.

Students who do not wish to participate in this plan, and have other comparable health insurance coverage, may submit a request to waive the health insurance. Please note that the waiver request must be submitted annually by the published deadline or the student will be responsible for paying the cost of the insurance. For information on the current insurance rates and the waiver request process, please visit the University Health Services website at https://uhs.nd.edu/insurance-billing/.

Information regarding the University-sponsored plan is mailed to the student’s home address in July and is also available online at: https://uhs.nd.edu/insurance-billing/. Additional information is available in University Health Services by calling the Office of Insurance and Accounts at 574-631-1882.

The cost of the premium for the 2020–21 academic year is detailed on the University Health Service website at uhs.nd.edu.

Payment Regulations. IRISHPAY is the University's online student account billing statement and payment system available to both students and their authorized payers. Statements are generated on a monthly basis. The fall semester student account statement is issued in early July; the spring statement is issued in early December. These statements list basic semester charges for tuition, fees, and room and meals. Additional statements for personal charges, including bookstore, health services, laundry and other miscellaneous charges are issued on a monthly basis. All fees and required deposits are to be paid in advance of each semester.

Secure online payment may be made using eCheck through IRISHPAY. Remittance should be made payable to the University of Notre Dame. The University does not accept credit card payments. Notre Dame students taking certain courses at Saint Mary's College that carry special fees will be billed for such charges according to Saint Mary's rates.

Separation Regulation. Any graduate, law, graduate business*, or undergraduate student who at any time within the school year wishes to separate from the University should contact the Office of the Registrar. To avoid failure in all classes for the semester and to receive any financial adjustment, the separating student must obtain the appropriate clearance from the dean of his or her college and from the Office of Student Affairs.

If the separation date is prior to the first day of classes, a full tuition credit will be made to the student's University account. If the separation date is on or after the first day of classes and before the last day for course discontinuance at the University, the tuition fee is subject to a prorated adjustment/credit, as explained below. In the special circumstance that a student is forced to separate for military service or separates because of protracted illness, the University will grant a financial credit to the student's University account for that portion of tuition charged for the semester in which he or she separated and did not receive academic credit, even if the separation occurs after the last day for course discontinuance.

Students receiving University and/or Federal Title IV financial assistance who separate from the University within the first sixty percent (60%) of the semester are not entitled to the use or benefit of University and/or Federal Title IV funds beyond their separation date. Such funds shall be returned promptly to the entity that issued them, on a pro rata basis, and the return of such funds to the issuing entity will be reflected on the student’s University account. When a student separates from the University after the first sixty percent (60%) of the semester, the student is entitled to the full benefit of the University and/or Federal Title IV funds awarded to him/her and no such funds are required to be returned to the issuing entity.

In order to determine the percentage of a semester that has been completed, count the number of days completed up to, and including, the separation date and then divide that number by the total days in the semester. (Any break of five days or more (e.g., Fall Break, Spring Break) is not counted as part of the days in the term.) The resultant percentage is the percentage of a semester that has been completed and also reflects the percentage of University and/or Federal Title IV aid earned by the student. The Academic Calendar posted on the Registrar’s website is the authoritative source for counting total and completed semester days for the purpose of this calculation.

When Federal Title IV funds must be returned because the student has not completed more than 60% of the semester, the amount that must be returned is based on the percentage of the student’s Federal Title IV aid that is unearned, as determined using the following formula:

- Federal Title IV aid to be returned = (100% minus the percentage of Federal Title IV aid earned by the student), multiplied by the total amount of Federal Title IV aid that could have been disbursed to the student during the semester if the student did not separate.

If a student earned less Federal Title IV aid than was disbursed as of the separation date, the University would be required to return a portion of the funds. Once Federal Title IV aid funds are returned by the University to the relevant federal program, the student borrower may have a remaining balance due to the University. A letter of explanation which specifies the amount owed and an updated statement are sent to the parent or student.

If a student earned more Federal Title IV aid than was disbursed to him/her by the University as of
the separation date, the University would owe the student a post-withdrawal disbursement, which must be paid within 180 days of the student's separation date. A letter of explanation about the disbursement of funds due to the student and an updated statement is sent to the parent or student.

This Separation Regulation may change subject to federal regulations.

The annual fee to enroll in the program is $45. For additional information or to enroll in the plan, call Nelnet toll-free at 888-470-6014 or visit studentaccounts.nd.edu/payments.

**Student Financial Aid**

The Office of Student Financial Services, which includes the Offices of Financial Aid, Student Accounts, and Student Employment, administers all student financial aid programs.

**Principles.** Notre Dame subscribes to the principles of student financial aid administration as endorsed by the CSS/Financial Assistance Assembly of the College Board and the National Association of Student Financial Aid Administrators. Notre Dame, along with the hundreds of other institutions, states, and organizations that follow these principles, includes demonstrated financial need as a criterion in awarding financial aid. In addition to a student's academic and personal credentials, financial need is an essential factor in the awarding of the University's scholarship/grant programs.

**Cost of Attendance.** The estimated average 2020–2021 Notre Dame undergraduate student expense budget includes:

<table>
<thead>
<tr>
<th>Direct Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuition and Fees</td>
<td>$57,699</td>
</tr>
<tr>
<td>Room &amp; Meals*</td>
<td>15,984</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$73,683</strong></td>
</tr>
</tbody>
</table>

In addition to the direct costs listed above, each student should plan for the cost of books, supplies, transportation, and personal expenses. Annual increases in costs should be anticipated. Further details may be obtained from the Office of Financial Aid website.

**Family Responsibility.** The University assumes parents will contribute to their children's education to the extent they are capable as long as the student is enrolled as an undergraduate. Notre Dame cannot accept financial responsibility for students whose parents discontinue this support for reasons other than ability to pay. It is important to note that the family includes both the parents and the student.

**Financial Need.** Financial need is the difference between the estimated cost of attendance for the school year and the estimated family responsibility. Because several factors in this evaluation are subject to change from one year to the next, this evaluation is made annually for each student who applies for financial aid.

Notre Dame is committed to offering financial aid that is designed to meet the demonstrated financial need of a student through our need-based aid programs. In most cases this may include opportunities for scholarships, loans, and/or work. The total financial aid received by a student may not exceed the total cost of attendance.

**Financial Aid Application Process.** The CSS Profile Application and the Free Application for Federal Student Aid (FAFSA) serve as the official applications for need-based financial aid, including University and club scholarship programs. Unless otherwise noted, additional applications are not required to be considered for all scholarship/grant programs the Office of Financial Aid administers.

A student should not wait for an admission decision before submitting the FAFSA and Profile. Applications for financial aid must be properly filed every year.

The FAFSA is available at fafsa.gov and should be filed according to the priority dates on the Office of Financial Aid website. The federal school code for identifying Notre Dame on the FAFSA is 001840.

The Profile is available at collegeboard.org and should be filed according to the priority dates on the Office of Financial Aid website. The Profile is required for University need-based scholarship consideration. Notre Dame's CSS code for the Profile is 1841. Undocumented or DACA students should complete the CSS Profile only.

If a student's parents are divorced or separated, the noncustodial parent must submit the CSS Noncustodial Profile application. The College Board will collect the noncustodial parent's information through an online process.

**Verification.** Federal regulation requires the University to verify and document certain information provided by students and their families in relation to an application for assistance. The Office of Financial Aid reserves the right to request additional documentation and/or clarification of a family's financial situation. Additional information is available on the Office of Financial Aid website.

**International Students.** Financial aid opportunities for first-year international students are limited and there is no funding to assist international transfer students. International students should be prepared to finance, either privately or through a sponsor, the full cost of their Notre Dame education. The International Student Certification of Finances must be submitted at the time of application for admission, illustrating and documenting sufficient financial support to meet the projected cost of a Notre Dame undergraduate education. The International Student Certification of Finances is available from the Office of Undergraduate Admissions website at admissions.nd.edu.

Prospective first-year students wishing to be considered for need-based financial assistance must first complete an International Certification of Finances along with a CSS Profile. Based on a review of academic qualifications, financial need, and availability of student aid resources, an applicant may be considered for financial assistance, including a self-help component of a student loan and student employment, along with University scholarship assistance. The Certification of Finances and the CSS Profile will be reviewed along with the student's application for admission. Additional information is available on the Office of Admissions website.

**FINANCIAL AID PROGRAMS**

There are numerous types of financial aid opportunities for students. The process outlined above is that which the student follows for all aid programs administered by the University's Office of Financial Aid.

Most aid programs will fall into one of three categories of assistance: scholarships/grants, student employment, or loans.

**SCHOLARSHIPS/GRANTS**

Scholarship/grant assistance is a type of aid that is free of repayment obligation.

**Merit Scholarships.** Notre Dame offers a limited number of merit scholarships to students accepted for admission as a first-time incoming freshman. Recipients demonstrate exceptional accomplishment, leadership, commitment to service, and intellectual promise. Typically, these scholarships are renewable for four years and recipients may be invited to participate in leadership development and enrichment opportunities as an additional benefit of their awards.

**Notre Dame Scholarships.** All students accepted for admission, who have completed the financial aid process as outlined above, are automatically considered for University scholarships. The level of University assistance is first based on demonstrated financial need, and then academic performance, and will thus vary from student to student. Renewal of University scholarship assistance is based upon a review of students' academic performance.
at the University and their annually demonstrated financial need. Based on the students’ admitted class level, University scholarship consideration is given for a maximum of eight semesters (10 semesters for the Architecture program and combination five-year engineering program with the College of Arts and Letters). Students electing to remain at Notre Dame to pursue a second major, second degree, or dual-degree program are not eligible for University scholarships.

Students not receiving scholarship/grant assistance may be considered in subsequent years based on financial need, academic performance, and the availability of University scholarship resources.

Notre Dame Club Scholarships. All applicants who complete the FAFSA and the CSS Profile are considered for club scholarships. Students will be advised by participating clubs if any additional steps (e.g., interview, essay) might be required by the local club.

Similar to University scholarships, club scholarships are awarded on the basis of demonstrated financial need. Since Notre Dame meets the demonstrated financial need of the student, the receipt of any club scholarship not listed in the Financial Aid Notification (FAN) will likely result in an adjustment to the financial aid award.

Federal Pell Grant. The Pell Grant is a non-repayable grant made available by the federal government to eligible undergraduate students enrolled in a degree-granting program.

Notre Dame cooperates with the U.S. Department of Education in administering this program. Applicants must be U.S. citizens or permanent residents of the United States.

The FAFSA serves as the application for the Pell program. Eligibility is determined by the Federal Methodology formula uniformly applied to all applicants.

Federal SEO Grant. The Federal Supplemental Opportunity Grant (SEOG) assists students demonstrating exceptional financial need in accordance with guidelines and funding allocations established by the Department of Education and the Office of Financial Aid.

State Scholarships and Grants. The states that currently award scholarship/grant assistance to Notre Dame students are Indiana, Rhode Island, and Vermont.

Reserve Officer Training Corps (ROTC). Air Force, Army, and Naval (Navy & Marine Corps) ROTC scholarships are available on a competitive basis, and the military services award them based on merit and personal qualifications. Further information is available through high school guidance offices, military recruiting offices, and the ROTC Departments of the University.

Veterans Educational Benefits. Veterans’ benefits are approved by the Indiana State Approving Agency. Students who qualify to use educational benefits can find information on the certification process on the Office of the Registrar’s website, https://registrar.nd.edu/students/veteran_affairs.php.

Department of Veterans Affairs Pending Payment Policy. The University will not take any of the four following actions toward any student using U.S. Department of Veteran Affairs (VA) Post 9/11 G.I.Bill® (Ch. 33) or Veteran Readiness and Education (Ch. 31) benefits, while their payment from the VA is pending:
• Prevent their enrollment;
• Access a late penalty fee;
• Require they secure alternative or additional funding;
• Deny their access to any resources available to other students who have satisfied their tuition and fee bills.

However, to qualify for this provision, students using Ch. 33 or Ch. 31 benefits are required to:
• Produce the VA’s Certificate of Eligibility by the first day of class;
• Confirm their use of VA benefits via a Benefit Election eForm.

Other Federal Assistance Benefits. Certain students may be eligible for special forms of federal agency benefits. Among these agencies are AmeriCorps, the Office of Vocational Rehabilitation, and the Bureau of Indian Affairs. Further details may be obtained through the appropriate local office of the particular agency.

Private Scholarships. Many private organizations provide financial assistance to Notre Dame students. Scholarship information may be obtained by contacting civic, professional, religious and other community organizations. The College Board’s Scholarship Search and fastweb.com provide scholarship search information. Caution is advised with respect to the use of fee-based scholarship search enterprises.

STUDENT EMPLOYMENT

Part-time employment opportunities, including those offered through the need-based federal work-study and paid community service programs, as well as other programs, are intended to help the student pay for personal and other related educational expenses.

The amount of employment eligibility indicated in the FAN is an estimate of potential earnings and not a guarantee of employment or earnings. Student employees average 10–12 hours of work per week.

LOANS

Borrowing a student loan is a matter that should be undertaken with the greatest of deliberation and with full knowledge of the responsibilities involved. In addition, all borrowers are advised of their loan repayment options and obligation upon entering and leaving the University. In an effort to provide additional information regarding a borrower’s rights and responsibilities, the Office of Financial Aid offers general counseling to all borrowers.

Federal Direct Student Loan Program. Direct Loans, from the William D. Ford Federal Direct Loan Program, are low-interest rate loans available to eligible students to help offset the cost of higher education. The lender is the U.S. Department of Education. The Direct Loan Program includes the subsidized and unsubsidized loans. For additional information on the terms and conditions of Direct Loans visit studentloans.gov.

Notre Dame Subsidized Loan. The Notre Dame Subsidized Loan is a need-based loan offered to students who demonstrate financial need. Additional information is available on the financial aid website.

Private Loans. After exhausting the opportunities available from the federal aid programs, many students will consider private loan programs as a source of funding. The terms and conditions of these programs vary, and as such, students are encouraged to review the details of the programs before selecting a private loan program. Additional information may be obtained from the Office of Financial Aid or its website.

OTHER

Monthly Payment Plan. The University makes available a monthly payment plan. Additional information is available in the Fees and Expenses section of this Bulletin.

Federal Direct PLUS. Parents of dependent students who have a valid FAFSA on file and whose student is enrolled at least half-time may apply for the Direct PLUS Loan. The parent must be a U.S. citizen or permanent resident. Direct PLUS Loan applications are subject to Department of Education credit review. For additional information on the terms and conditions of Direct Loans visit studentloans.gov.

Note: program is subject to federal legislative change.
Standards of Progress for Recipients of Financial Aid

The United States Department of Education requires students to maintain satisfactory progress toward completing their degree in order to receive financial aid. Recipients of federal, state, institutional and private resources, including grants, scholarships, work-study, and student and parent loans, are subject to these standards. Satisfactory academic progress requirements for financial aid recipients are not the same as the University's requirements for academic good standing.

Satisfactory academic progress is reviewed annually after spring grades are posted by the Registrar's Office to determine financial aid eligibility for the subsequent summer and academic year. Students returning to the University following a withdrawal or dismissal will be evaluated at the time of readmission.

Students are required to maintain the minimum cumulative grade point average, be on pace to graduate and complete their degree within a maximum time frame as defined below. All semesters of enrollment are reviewed regardless of whether aid was received for those semesters.

Minimum Cumulative Grade Point Average (GPA)

Students are required to meet the following minimum cumulative GPA requirements:

<table>
<thead>
<tr>
<th>Classification</th>
<th>Minimum Cumulative GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Freshmen</td>
<td>1.75</td>
</tr>
<tr>
<td>Upperclass Students</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Pace to Graduate

Students are required to earn a minimum of 67% of cumulative hours attempted to stay on pace to graduate. Pace is calculated by dividing the cumulative number of hours earned by the cumulative number of hours attempted (this includes dropped classes).

Maximum Time Frame

Students are required to complete their degree requirements within a maximum time. Based on an undergraduate student’s admitted class level, University scholarship consideration is given for a maximum of eight semesters (ten semesters for the architecture program and combination five-year engineering program with the College of Arts and Letters). Students needing additional time to complete their degree requirements due to a change in major, second major, dual degree or retaking coursework are not eligible for University scholarship.

Students may receive federal aid consideration for a maximum time frame measured by attempted credit hours equal to 150% of the published length of their degree program. Once a student reaches his/her total maximum time frame, or it has been determined he/she cannot complete their degree within this time frame, they are no longer eligible to receive federal aid.

Credits and Grades Used to Determine Pace and Maximum Time Frame

All coursework attempted, including repeated and withdrawn coursework recorded on the student’s academic record as of the seventh class day, is considered when calculating pace and maximum time frame and determining whether the student meets satisfactory academic progress.

<table>
<thead>
<tr>
<th>Course/Grade</th>
<th>Included in Earned Credits</th>
<th>Included in Attempted Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP (Advance Placement) Credits</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Credit by Exam</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Transfer Credits</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Grades: E*,I,INR.U,V,W,X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

The University’s Grade Scale is available through the Office of the Registrar.

Failure to Maintain Satisfactory Academic Progress

Failure to maintain one or more of the requirements outlined above will result in financial aid ineligibility. Students will be notified via University email of their failure to meet satisfactory academic progress requirements and subsequent aid suspension.

Students can regain their financial aid eligibility once they have raised their cumulative GPA to 2.00 and have earned hours to put them back on pace to graduate (earned 67% of cumulative hours attempted) within the maximum time frame. Students can also regain financial aid eligibility if they have an appeal approved based on the process below.

Appeal Process

At the time of notification regarding failure to meet satisfactory academic progress requirements, the student must submit a written appeal outlining mitigating circumstances. The appeal letter should include the following:

- Mitigating circumstances that prevented the student from meeting the requirements of academic progress (e.g. death in the family, student illness or injury, other personal circumstances). Mitigating circumstances do not include: withdrawing from classes to avoid failing grades, pursuing a second major or degree, etc.
- Documentation that supports the student’s basis for the appeal
- Steps the student has taken/will take to ensure future academic success
- Anticipated graduation date
- If it is not possible for the student to achieve satisfactory academic progress with one successful probationary semester, the student must also submit an academic plan signed by their academic advisor. This plan should outline the student’s academic goals for each semester (e.g. number of credit hours and cumulative GPA) that will enable the student to meet the requirements of academic progress at a specified future point in time.

Upon receipt of all completed appeal materials, the student will be considered for a probationary semester of financial aid in order to reestablish satisfactory academic progress. Students whose appeal is approved will be placed on financial aid probation.

Students who fail to meet the requirements for academic progress for their probationary semester or do not complete the requirements of their academic plan will again be ineligible for financial aid and subject to the appeal process.

Students who meet the requirements for academic progress for their probationary semester will resume good standing and again be evaluated at the conclusion of the following spring semester.

Denied Appeals/Students Who Choose Not to Appeal

If an appeal is denied, they will be notified via University email and remain ineligible for financial aid assistance until satisfactory academic progress is reestablished. The student will be responsible for all charges on their University account.

Center for Social Concerns

The Center for Social Concerns brings students, faculty, and community partners together to address community needs through analysis and reflection that leads to ethical action and social relationships. Its extensive domestic and international programming provides students with opportunities for community-engaged learning, research, and service addressing issues of poverty and injustice.

Students examine social, moral, and ethical issues from various perspectives through the lens of Catholic social teaching.

The Center houses the Poverty Studies Interdisciplinary Minor (PSIM). Many of the
Center’s courses fulfill the minor’s experiential learning requirement.

- The Center partners with the College of Arts and Letters to offer the Catholic Social Tradition (CST) minor.
- The Center offers three types of courses: social concerns seminars (1 credit), summer service-learning projects (3-4 credits), and community-based learning courses across the disciplines (3 credits). All courses can be found using the class search (ZCSC) course attribute filter.
- Students interested in community-based research work with faculty and community partners in many ways: as part of an existing course, an internship, a senior thesis, or special studies class on a research project that aims to generate social action and social change.
- The Center offers programs and seminars for senior transitions and career discernment after graduation.
- The Center offers events, workshops, and panel discussions with campus partners to advance understanding of civic and social concerns such as voting rights, incarceration, racial justice, immigration, sustainability, poverty, and much more.
- The Center partners with over 100 social service and advocacy organizations worldwide to offer students diverse learning opportunities.
- Visit the Center for Social Concerns at http://socialconcerns.nd.edu/

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Center for Social Concerns. Course descriptions can be found by clicking on the subject code and course number in the search results.

**POVERTY STUDIES INTERDISCIPLINARY MINOR WITHIN THE CENTER FOR SOCIAL CONCERNS**

**Poverty Studies** (povertystudies.nd.edu)

**Director:**
Connie Snyder Mick

**Affiliated Faculty:**
Visit povertystudies.nd.edu/about/the-faculty/

The Poverty Studies Interdisciplinary Minor (PSIM) contributes to Notre Dame’s mission by requiring its students to examine poverty, social injustice, and oppression from the perspectives of the social sciences, the humanities, sciences, and business.

PSIM explicitly recognizes the interconnected nature of the causes of poverty and the problems of low-income families and individuals, and provides a framework that assists students in making the links between the contributions of multiple and varied disciplines. It also helps students contextualize their personal interactions with low-income populations and the institutions that serve them, and make the connections between classroom lessons and real world experiences.

PSIM is an appropriate supplement to every major at the University because it is designed to help students understand how their future civic activity and professional work—in almost any area—will invariably impinge on vulnerable persons and communities.

**Requirements.** An interdisciplinary minor in Poverty Studies consists of 15 or 16 credit hours, including a required gateway course, experiential learning (service learning, community-based research, or immersion); elective coursework selected from a list of courses approved by the director on the advice of the affiliated faculty; and senior capstone seminar or special studies/senior thesis.

**Gateway course (3 credits).** The gateway course introduces students to academic research about the nature, causes, and consequences of poverty. Throughout, the readings and lectures reveal the collaboration across the various disciplines, the array of interlocking problems that lead to poverty, and guides the formulation of policies to prevent and alleviate poverty. Attention is given to poor citizens of the United States and developing nations.

**Experiential learning (3 or 4 credits).** The experiential learning requirement is designed to get students into the field where the concepts discussed in classrooms come to life and disciplinary boundaries are challenged. Experiential learning enhances a student’s understanding of poverty and prepares students for the final capstone experience, whether it is the seminar or an independent research project. The experiential learning requirement may be satisfied by satisfactorily completing one of the following options:

- three designated 1-credit Center for Social Concerns seminars combined with PS 35001; or
- three credits of internship(s) with community agencies and organizations serving the poor; or
- one approved 3-credit community-based learning research course.

**Three 1-credit seminars offered by the Center for Social Concerns.** Participating in CSC seminars is a well-established tradition among Notre Dame students. PSIM students may satisfy the experiential learning requirements by bundling three Center for Social Concerns 1-credit experiential learning seminars with PS 35001. When choosing this option, students must take the Urban Plunge Seminar (THEO 33963/CSC 33963), the Appalachia Seminar (THEO 33950/CSC 33950), and another approved seminar.

**Three credits of internship(s).** Each semester, many Notre Dame students engage in internships with community agencies and organizations working to improve the well-being of low-income individuals and families. Three total credits of internship experience with the same or different agencies satisfy this requirement.

**One 3-credit community-based research course/project.** This requirement may be fulfilled during the academic year by completing a regularly scheduled course with a community-based research component, by participating in a summer service learning project sponsored by the Center for Social Concerns (domestic or international), or by completing a national summer internship through the Shepherd Program.

**Electives (6 credits).** Two courses from the list of approved Poverty Studies minor electives. See http://povertystudies.nd.edu.

**Capstone Experiences (3 credits).** As the final step in the PSIM, students may choose either to enroll in the capstone seminar or to undertake a 3-credit special studies project directed by one of the affiliated faculty. Students must talk with the director at least one semester in advance to work through the proposal process. The capstone seminar is topic-oriented drawing on literature from multiple disciplines. The students will be from different majors and will share the perspectives of their major disciplines as well as their varied experiences in the field, thus ensuring the interdisciplinary nature of the inquiry. Students may also opt for research or other intellectual experience by enrolling in special studies capstone with one of the minor’s affiliated faculty. In this case, the students will produce a project (manuscript, work of art, composition, poster board display of research results, etc.) and will present this project to the members of PSIM at a special colloquium held in the spring semester of each academic year.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Poverty Studies, or by highlighting all of the course subjects simultaneously and selecting the “PSIM-Poverty Studies Elect.” course attribute. Course descriptions can be found by clicking on the subject code and course number in the search results.

**To Table of Contents**
Reserve Officers Training Corps Programs

The University of Notre Dame offers the opportunity to combine the pursuit of an academic degree with earning an officer's commission in either the United States Army, Navy, Marine Corps, or Air Force. Students enrolled in any of the colleges of the University may participate in the Reserve Officers Training Corps (ROTC). Selection of courses in the student’s academic major is independent of those selected for ROTC.

The College of Arts and Letters and the College of Business Administration accept a maximum of 12 free elective credits from the 30000- and 40000-level military sciences only. Credit from the 10000- and 20000-level courses does not count toward the degree requirements and must be subtracted from the total number of degree credits listed on the transcript.

In the College of Engineering, ROTC students who complete the ROTC program are permitted a maximum of six credits of upper-level air, military or naval science as substitutes for specified degree requirements determined by the department. Not more than three credits may be substituted for history or social science. All air, military or naval science credits not so substituted are not credited toward degree requirements in programs.

In the School of Architecture, ROTC students are permitted a maximum of six credits of 40000-level air, military or naval science courses as substitutes for electives within the 163 credit hours required for the bachelor of architecture degree.

The College of Science will count a maximum of six credit hours of upper-level (30000- or 40000-level) ROTC courses toward the 124-credit-hour requirements. These courses will be counted as free electives.

MILITARY SCIENCE AND LEADERSHIP

Chair and Professor:
Lieutenant Colonel George P. Lachicotte III
Commandant of Cadets:
Master Sergeant Mark V. Lavender
Assistant Professors:
Major Michael Murrell

As one of the premier Army ROTC Battalions in the country, the department's mission is to educate, train, develop, and inspire participants to become officers and leaders of character for the US Army and the nation. The program does this through a combination of classroom instruction, leadership labs, and experiential learning opportunities focused on developing the mind, body, and spirit of participants. These opportunities are designed specifically to enhance character and leadership ability in the Cadets and to allow them to practice the essential components of leadership: influencing, decision making, and developing others. Participants become members of the Fightin’ Irish Battalion and complete a planned and managed sequence of classroom courses and practical exercises intended to develop each participant into what an US Army officer must be—a leader of character, a leader with presence, and a leader of intelligence—to enable them to reach their full potential as individuals and as effective leaders of groups. The program affords students an excellent opportunity to serve their country and focuses on the role of Army officers in the preservation of peace and national security, with particular emphasis placed on ethical conduct, understanding officer's leadership responsibility to society, develop themselves as well as others, and achieve life-long success. The experience culminates ideally with participants earning a commission as a Second Lieutenant in the Active Army, Army Reserve, or Army National Guard. As an organization committed to lifelong learning, participants may elect to pursue one of the Army's numerous opportunities for follow-on postgraduate study as well.

Student Awards and Prizes.
The Dexam Award. Named in memory of an alumnus of the Notre Dame Army ROTC Battalion, annually recognizes an outstanding junior who has exemplified the highest professionalism, dedication, and service to the Fightin’ Irish Battalion.

George C. Marshall Award. An award given annually to the top Cadets in Cadet Command. Winners participate in a national seminar with some of the nation's highest ranking leaders in Fort Leavenworth, KS.

The Schellinger/Dukeman Commander's Award. Named in honor of Notre Dame Army ROTC Battalion alumni and former Cadre, annually recognizes the most outstanding Cadets of the fall semester with a US Army saber for their ability to collaborate as a teammate and be a leader amongst peers.

The Haley Award. Named in memory of an alumnus of the Notre Dame Army ROTC program, a hand-carved Irish shillelagh is presented annually to the Cadet who displays the Notre Dame Ethos of “God, Country, Notre Dame” and serves as a mentor for the junior Cadets in the program.

The McKee Award. Named in honor of an alumnus of the Notre Dame Army ROTC Battalion, a US Army saber is presented annually to an outstanding member of the Army ROTC Club.

The Brooks Award. Named in memory of a student and contributor to Notre Dame Army ROTC Battalion, a commemorative plaque and knife is presented annually to an outstanding member of the Irish Rangers.

The Jordan Exemplar Award. Named in honor of a contributor to Notre Dame Army ROTC Battalion, a US Army saber is presented each year to an outstanding member of the Fightin’ Irish Battalion who best exemplifies the qualities of scholarship, leadership, and piety.

Numerous other awards are presented annually by various local and national organizations to recognize excellence in academic achievement and military aptitude.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Military Science (Army ROTC). Course descriptions can be found by clicking on the subject code and course number in the search results.

NAVAL SCIENCE

Chair and Professor:
CAPT Mark Prokopius, USN
Associate Professor:
CDR Jason D. Thompson, USN
Assistant Professors:
Capt Matthew Brockelmeyer, USMC
LT Thomas Verbeeck III, USN
LT Brian VanMetre, USN
LT Austin Chung, USN
LT Mark Livengood, USN

The mission of NROTC is to educate, train, and screen officer candidates to ensure they possess the moral, intellectual, and physical qualities for commissioning and the leadership potential to serve successfully as company grade officers in the U.S. Navy and Marine Corps. The NROTC Scholarship Program fills a vital need in preparing mature young men and women for leadership and management positions in an increasingly technical Navy and Marine Corps.

Non-NROTC students should consult with their college dean or advisor to determine if a Naval Science course will count toward graduation.

Additional NROTC Curriculum Requirements.
In addition to the Naval Science requirements, NROTC scholarship students are required to complete other specified university courses. These additional requirements are taken as a part of the student's field of study or as degree electives, depending upon the college in which enrolled. Students will be notified of such requirements prior to joining the NROTC Program.

Student Organizations and Activities. All NROTC students are integrated into the Midshipman Battalion organization. In addition to participation in all other university organizations and activities for which eligible, NROTC students may participate in specific NROTC organizations and activities such as the Color Guard, intramural athletic teams, the NROTC Unit newspaper and yearbook, and the planning of the Naval Leadership Weekend national conference.

To Table of Contents
Student Awards and Prizes.
The Chief of Naval Operations Distinguished Graduate Award. The annual recognition of the top graduating midshipman.

The Edward Eashby-Smith Award. A sword is awarded to one of the top graduating Navy or Marine Option Midshipmen who exemplified the characteristics of a naval officer while filling one of the senior midshipman staff positions during the past year.

The 1st LT. Vincent J. Naimoli, USMC Award. A sword is awarded to one of the top graduating Navy or Marine Option Midshipmen demonstrating 110 percent dedication and effort in academic achievement, student activities, and leadership.

The George C. Strake Award. A sword is awarded to the top graduating Navy Option Midshipman for his or her dedication, leadership, esprit, and positive attitude throughout the four years at Notre Dame.

The Colonel Brian C. Regan, USMCR Award. A sword is awarded to the top graduating Marine Option Midshipman for his or her superior leadership and esprit de corps throughout the four years at Notre Dame.

Gallagher-Snider Award. A sword is awarded to a first class Navy or Marine Option Midshipman who displayed outstanding academic achievement, superior military bearing, and exceptional leadership and physical fitness throughout their four years at Notre Dame.

Numerous other awards are presented annually by various professional and patriotic organizations to recognize excellence in academic achievement and military aptitude.

COURSE DESCRIPTIONS
NROTC students take a total of 22 credits of Naval Science, one course each semester. All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Naval Science (ROTC). Course descriptions can be found by clicking on the subject code and course number in the search results.

AEROSPACE STUDIES
Chair and Professor:
Colonel Casey M. Ramsby, USAF
Assistant Professors:
Lieutenant Colonel Travis J. Brabec, USAF
Captain Casey Beaty, USAF
Captain Anthony Trombley, USAF

The Air Force Reserve Officer Training Corps (AFROTC) Detachment 225 is a premier educational and training program designed to give men and women the opportunity to become world-class leaders as Air Force officers while completing an undergraduate four-year academic degree. The AFROTC Program develops leadership and management skills students need to become effective and trusted leaders in the 21st century. In return for challenging and rewarding efforts, we offer the opportunity for advancement, education and training, and a sense of pride that comes from serving in the United States Air Force. Upon completion of the Air Force ROTC program students are commissioned as second lieutenants in the United States Air Force. Following commissioning there are excellent opportunities for additional education in a wide variety of academic fields.

Student Organizations and Activities. All Air Force ROTC cadets are given opportunities to participate in a variety of extracurricular activities to develop their leadership skills. Activities available for AFROTC cadets include the Arnold Air Society (AAS), oriented toward service to the local community, AFROTC Career Day, Veterans Day Vigil, Junior Parents weekend, annual Flying Irish Basketball Tournament, intramural and varsity athletics, University bands and cheerleading activities as well as the Honor Guard. The Honor Guard performs at campus and community functions while developing individual drill proficiency. Foreign language programs, engineering programs, and cultural leadership studies are occasionally available during the summer.

Student Awards and Prizes.
The Notre Dame Air Force Award, and Air Force officer’s sword, are presented to the top graduating senior in Air Force ROTC.

The Noël Dube Award is presented to the senior class Arnold Air Society member who has contributed the most to furthering the ideals and goals of the society within the University and local community.

The Paul Robégé Award, named in memory of an alumnus of the Notre Dame ROTC program, annually recognizes the top pilot candidate in the Professional Officer’s course.

Other awards are sponsored by various local and national organizations to recognize excellence within the cadet corps.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Air Force-Aerospace Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

* Leadership Laboratory is open to students who are members of ROTC or who are eligible to pursue a commission as determined by the professor of Aerospace Studies.

Study Abroad
Notre Dame International’s Study Abroad offers over 70 study abroad programs in more than 20 countries during both the academic year and summer.

For over 50 years, Notre Dame has made it possible for students to earn credits toward graduation by participating in study abroad programs. Study in another tradition, direct personal experience of another language and culture, and travel all broaden and deepen the liberal education of the whole person to which the University has always been committed. Study abroad programs are one of the many opportunities open to students seeking an international experience that will complement their study plan.

Without delaying graduation, international experiences make a unique contribution to the excellence of liberal education in the undergraduate colleges and frequently have proved an asset in career development. Students earn Notre Dame credit for courses taken in Notre Dame programs and their grades are included in the Notre Dame GPA.

During the semester abroad, students are expected to carry a course load of 15 credits. Some courses taught abroad fulfill core University Ways of Knowing requirements. For major credit in any college department, students must consult with departmental advisors. Course listings for hundreds of courses taught in the listed programs are available on the Study Abroad website under Courses Abroad and also through Class Search on the Registrar’s website.

Qualified students from all undergraduate colleges may apply to spend a semester or a year abroad in one of our study abroad programs. Participation is typically during the junior year, but some programs are designed to accommodate sophomores as well.

Admission into many of the programs can be competitive and students are encouraged to apply to more than one program. Offers of admission are made in accordance with program requirements, at the discretion of the Study Abroad staff in consultation with faculty and staff of the University.

Students considering more than a single semester or academic year program should carefully review their majors and minors to ensure that such study does not delay the completion of graduation requirements. Participation in a summer study abroad program does not affect a student’s application to a semester or yearlong program.

Study abroad programs may sometimes be cancelled due to circumstances beyond the control of the University.

Students are eligible to apply for a leave of absence through their college for study in a program offered by another college or university. They may not, however, take a leave of absence to attend international programs at sites (schools) where Notre Dame offers
its own study abroad programs. The information published here summarizes the planned study abroad opportunities at the University of Notre Dame for the 2020–21 academic year. However, international circumstances stemming from the ongoing coronavirus pandemic may affect these plans. Please consult the Study Abroad Office’s website at https://studyabroad.nd.edu/ for the latest information.

ACADEMIC YEAR PROGRAMS

Notre Dame offers semester and yearlong study abroad programs around the world. In Europe, students may apply to go to Copenhagen, Denmark; Angers or Paris, France; Berlin or Heidelberg, Germany; Athens, Greece; Dublin or Galway, Ireland; Bologna or Rome, Italy; Alcoy or Toledo, Spain; Geneva, Switzerland; or London, Norwich, St Andrews, or Oxford, United Kingdom.

For a Latin American experience, undergraduates can study in São Paulo, Brazil; Santiago, Chile; or Puebla, Mexico.

In Africa, the Middle East, and Eastern Europe, students have the option to participate in programs in Jerusalem, Israel; Amman, Jordan; Rabat, Morocco; Kigali, Rwanda; and Moscow, St. Petersburg, and Vladimir, Russia.

Notre Dame also offers programs in the Asian Pacific region in Fremantle, Perth, and Sydney, Australia; Shanghai, Beijing, and Hong Kong, China; Nagoya, Kyoto, and Tokyo, Japan; in Seoul, South Korea; and Singapore.

Additional programs offered in 2020–21 include the Kennedy Scholars in the London Undergraduate Program who undertake independent research and a research seminar course in preparation for a senior thesis. The Rome International Scholars program offers a semester of specialized study in Rome and funding for disciplinary study and/or a practicum during the summer following the semester of study.

Candidates for Alcoy, Amman, Angers, Berlin, Bologna, Geneva, Heidelberg, Kigali, Nagoya, Paris, Puebla, Rome, Russia, Santiago, and Toledo study abroad programs need to demonstrate skills in the language of the country to make their period of study abroad programs need to demonstrate skills in the language of the country to make their period of residence and study fully profitable. These skills may be developed through intensive or other language courses in the freshman or sophomore year. Previous study of the language in high school is mandatory for some programs.

Instruction is in Arabic and English in Amman; Chinese and English in Beijing, Shanghai, and Hong Kong; English in Athens, Dublin, Fremantle, Galway, Jerusalem, Kigali, London, Norwich, Oxford, Perth, Seoul, Singapore, St. Andrews, and Sydney; French in Angers and Paris; German in Berlin and Heidelberg; Italian in Bologna; Italian and English in Rome; Japanese and English in Nagoya and Tokyo; Portuguese and English in São Paulo; Russian in Russia; and Spanish in Alcoy, Puebla, Santiago, and Toledo.

SUMMER PROGRAMS

International summer programs for students who have completed at least one year of studies at Notre Dame are available in Addis Ababa, Ethiopia; Beijing and Hong Kong, China; Berlin, Germany; Corinith, Greece; Dublin, Ireland; Jerusalem, Israel; Paris, France; Milan and Rome, Italy; Rabat, Morocco; Warsaw, Poland; Moscow, Russia; Cape Town, South Africa; Toledo, Spain; and London, United Kingdom.

Additional specialized summer programs include Global Professional Experience in China, India, Brazil, UK, and Greece (internship); China Summer Language; German Engineering, and International Economics Abroad (based in Germany).

The locations of the faculty-led summer programs may vary from year to year. The length of the programs and the credits offered also vary by program. See the Study Abroad website for detailed information about each summer program.

Additional programs abroad are sponsored by the School of Architecture in Rome (yearlong) and by the College of Engineering in Berlin (summer), Dublin (summer), London (summer), Rome (summer), and Alcoy, Spain (summer).

AUSTRALIA: SYDNEY PROGRAM

Semester
University of Sydney
Sydney Global Mobility | Level 4 Jane Foss Russell Building G02 | NSW 2006, Australia

The Sydney exchange program is designed for juniors and is open to students from the colleges of Engineering and Science. Students in Arts and Letters, especially pre-professional and anthropology majors, may also apply. The University of Sydney is Australia’s first university (opened in 1852) and it continues to provide strong academic programming and student support as a member of Australia’s prestigious “Group of Eight” research-intensive universities. Engineering & IT, Health Science, Law, Medicine, Nursing, Pharmacy, Science, Agriculture, and Veterinary Science represent just a few of the disciplines that are represented at the University.

BRASIL: SÃO PAULO PROGRAM

Semester
Pontificia Universidade Católica - São Paulo (PUC-SP)
R. Monte Alegre, 984 | Perdizes, São Paulo | SP 05014-901, Brazil
Fundação Getúlio Vargas (FGV)
Casa Verde Building | Rua Sílvia, 23, Buildings 05-10 & 12 | Bela Vista, Brazil

The São Paulo program is open to qualified students in all majors, but may be of significant interest to students studying Portuguese, Brazilian Studies, Business, Poverty Studies, or Sociology. Students choose from electives drawn from a wide range of courses offered at PUC or FGV for which they meet the prerequisites. Courses in FGV are taught entirely in English.

CHILE: SANTIAGO PROGRAM

Semester or Academic Year
Pontificia Universidad Católica de Chile (PUC)
Campus San Joaquin | Av. Vicuña Mackenna 4860, Macul | Santiago, Chile

All participants in the Chile program begin the semester with a two-week language and cultural immersion pre-program in rural Chile. After the pre-program, students travel to Santiago, Chile, where they enroll in classes at the Pontificia Universidad Católica (PUC). Students enroll in two or three classes at the PUC in addition to two mandatory core courses: Spanish for Foreigners and Chilean Politics and Society. Students may also choose to apply in a service-learning course,
Approaches to Poverty and Development taught at Universidad Alberto Hurtado. All students live with host families in Santiago who are carefully selected by Notre Dame’s on-site staff. The fall semester runs from mid-July through mid-December, and the spring program runs from early February through mid-July.

**CHINA: BEIJING PROGRAM**

**Semester or Academic Year**
Beijing-PKU | Peking University | 5 Yiheyuan Road [Haidian Qu] | Beijing, China, 100080

The Beijing-PKU program is a direct enroll exchange program that allows students to take their classes alongside local and other international students. The program is strongly recommended for Chinese majors, but may also be of interest to students from the College of Arts and Letters and the Mendoza College of Business.

**CHINA: HONG KONG PROGRAMS**

**Semester or Academic Year**
Chinese University of Hong Kong (CUHK) | Shatin, N.T. | Hong Kong, China

The CUHK program is an exchange program open to sophomores and is particularly suited to students studying the humanities, business, engineering, or science. CUHK is a bilingual, bicultural institution with local and international students and scholars. CUHK receives students from over 180 academic institutions worldwide. No Chinese language study is required, and students may choose from many courses that are taught in English or take courses taught in Chinese if they meet the language proficiency requirement.

**CHINA: SHANGHAI PROGRAM**

**Semester or Academic Year**
East China Normal University (CJEE) | 3663 North Zhongshan Road | Global Education Building, 4th Floor | Shanghai 200062 China

Study Abroad offers this option in conjunction with the Council on International Educational Exchange (CJEE). The Shanghai Program at East China Normal University is intended for students who wish to accelerate their acquisition of Chinese and is strongly recommended for all Chinese majors and minors. There are three study tracks: Accelerated Chinese Studies; Business, Language, and Culture; and China in a Global Context. There is no language prerequisite, but all students must take a Chinese-language course and other courses on Chinese history, culture, and politics offered in English. Organized group activities complement the classroom experience.

**GERMANY: BERLIN PROGRAM**

**Spring Semester or Academic Year**
Freie Universität Berlin | 14195 Berlin | Germany

The Berlin Program is part of the Berlin Consortium for German Studies (BCGS), administered by Columbia University. This program is designed for students with at least two years of university-level German language instruction and is, therefore, typically open only to juniors. This program provides in-depth study of German language, culture, and society, and the opportunity to observe first-hand the emerging impact of a reunited Berlin—now considered Germany’s cultural, political, and economic center—on the rest of Europe. The program begins with a six-week intensive language practicum; students then enroll in one course (taught by the BCGS directors) that reflects their academic interests, focusing on such topics as culture, politics, history, literature, theater, or cinema, in addition to at least two courses at the university. Freie Universität Berlin offers a wide range of courses in the humanities, social sciences, and natural sciences. All coursework will be in German.

**FRANCE: PARIS PROGRAM**

**Semester or Academic Year**
Institut d’Études Politiques de Paris—Sciences-Po | 13 rue de l’Université | 75007 Paris, France

In 1999, the University of Notre Dame began an exchange program with the Institut d’Études Politiques de Paris (Sciences-Po). Offered as a yearlong or a semester program, the Paris program is limited to students with at least a high level of French, an excellent grade point average, and a major in history or a social science. Students will take courses in European economics, politics, sociology, and history, and in French language. Successful completion of a year of study results in a certificate from Sciences-Po, which is widely recognized in Europe and the United States.

**FRANCE: ANGERS PROGRAM**

**Semester or Academic Year**
Université Catholique de l’Ouest (UCO) | SUNDEF Office | 3, place André Leroy | BP 10808 | 49008 Angers, France

The Angers program is open to sophomores and juniors in all colleges. Many Angers students decide to pursue a first or second major in French. Declared and prospective French majors must consult with the Department of Romance Languages and Literatures before they apply for the program. An academic year of two semesters begins with a month-long intensive summer session, the préstage. Most Angers students take the bulk of courses within the Centre International d’Études Françaises (CIDEF), UCO’s language institute. CIDEF students with advanced French language skills may also register for a cours universitaire through one of the institutes at UCO. All instruction is in French.

**DENMARK: COPENHAGEN PROGRAM**

**Semester**
DIS-Danish Institute for Study Abroad | DIS Copenhagen | Vestergade 7 | 1456 Copenhagen | Denmark

DIS offers students engaging and challenging coursework taught by faculty practitioners in a variety of programs enriched by field studies, hands-on learning opportunities, and study tours across Europe. Cultural engagement opportunities integrate students into the local culture and students gain academic knowledge and intercultural skills to prepare for a globalized world. Students in design, pre-professional and science studies will find a variety of study programs with DIS. All courses are taught in English.

**GERMANY: BERLIN PROGRAM**

**Spring Semester or Academic Year**
Freie Universität Berlin | Boltzmannstrasse 4 | D 14195 Berlin | Germany

The Berlin Program is part of the Berlin Consortium for German Studies (BCGS), administered by Columbia University. This program is designed for students with at least two years of university-level German language instruction and is, therefore, typically open only to juniors. This program provides in-depth study of German language, culture, and society, and the opportunity to observe first-hand the emerging impact of a reunited Berlin—now considered Germany’s cultural, political, and economic center—on the rest of Europe. The program begins with a six-week intensive language practicum; students then enroll in one course (taught by the BCGS directors) that reflects their academic interests, focusing on such topics as culture, politics, history, literature, theater, or cinema, in addition to at least two courses at the university. Freie Universität Berlin offers a wide range of courses in the humanities, social sciences, and natural sciences. All coursework will be in German.
Study Abroad

GERMANY: HEIDELBERG PROGRAM

Semester or Academic Year
Heidelberg Universität
AJY | Haupstrasse 133 | 69117 Heidelberg | Germany

This program provides in-depth study of German language, culture, and society. The program begins with a four-week intensive course, Aspects of Society and Culture in Contemporary Germany, which provides the students with at least 60 hours of intensive language training and excursions to various cultural institutions around Heidelberg. Heidelberg Universität offers a wide range of courses in the humanities, social sciences, and natural sciences. All coursework will be in German.

GREECE: ATHENS PROGRAM

Semester
College Year in Athens (CYA)
CYA/DIKEMES | 5 Plateia Stadiou | GR-116 35 Athens | Greece

Sophomores and juniors study with other international students at the College Year in Athens. CYA offers an extensive range of academically outstanding courses and unique learning opportunities spanning a wide range of disciplines from Ancient to Contemporary studies, enriched by hands-on learning opportunities and on-site classes. In addition to Anthropology, Art History & Archaeology, and Classical Languages of Ancient Greek and Latin, students are offered classes in Communications, Economics, Environmental Studies, History, Literature, Modern Greek, Philosophy, Political Science & International Relations, Religion, and Urbanism & Sustainability.

INDIA: MUMBAI PROGRAM

Fall Semester
St. Xavier's College
5, Mahapalika Marg, Mumbai, Maharashtra 400001

The program with St. Xavier’s College in Mumbai is one of Notre Dame's newest exchange programs. The India-focused curriculum is ideal for students in the College of Arts & Letters and may also be suitable for students in the College of Science, as courses are offered in a variety of subject areas. Students will integrate directly into the campus community and take courses alongside local students. They will also have the opportunity to work with local NGOs and participate in a variety of service activities in Mumbai.

IRELAND: DUBLIN PROGRAMS

Semester
University College Dublin (UCD) | Belfield | Dublin 4, Ireland
Trinity College Dublin (TCD) | College Green | Dublin 2, Ireland

The Dublin programs at University College Dublin and Trinity College Dublin are available to qualified juniors. Students will enroll in courses in their majors at one of the two Universities and will also take a course at the Dublin Global Gateway, also known as the O’Connell House. For course offerings at the Irish universities, check the Study Abroad website. The Introduction to Ireland course taught at the Dublin Global Gateway is mandatory for all program participants. The Center may also offer an Irish Literature course during certain semesters. Students will live in dormitories at the respective Universities with Irish and other international students.

Spring Semester
Dublin City University (DCU)
International Office | John Hand Library | All Hallows Campus | Drumcondra | Dublin 9, Ireland

This program has been developed for Computer Science and Engineering and Business Analytics students. In addition to required engineering-related or business analytics-related courses at DCU, students are able to participate in courses offered at the Dublin Global Gateway, particularly the Introduction to Ireland course taught at O’Connell House.

IRELAND: GALWAY PROGRAM

Semester
National University of Ireland-Galway (NUIG)
International Office | 7 Distillery Road | Galway, Ireland

Notre Dame students now have an opportunity to study in the cultural center of Ireland at NUIG, the largest and oldest university in the west of Ireland. It is a leading research university in biomedical science and engineering, marine science, energy and environmental science. Additionally, NUIG promotes a wide range of disciplines from Ancient to Contemporary studies, including Irish Studies, to provide for the study of modern and contemporary Irish literature, music, history, language, and culture.

ITALY: BOLOGNA PROGRAM

Semester or Academic Year
Università di Bologna (UniBo)
Bologna Consortial Studies Program | Via Val d’Apoa, 7-ANT 15 | 40123 Bologna BO | Italy

Students matriculate at the Università di Bologna (UniBo) through Notre Dame’s association with the Bologna Consortial Studies Program (BCSP), administered by Indiana University. Typically, students are juniors at the time of participation and have completed the equivalent of four, preferably five, college-level Italian courses. Students attend a four-week preparatory pre-session in September before beginning classes at UniBo. Organized group activities complement the classroom experience. Direct matriculation at the University of Bologna, one of Italy's premier universities, coupled with living in apartments with Italian students, provides a genuine experience of Italian university life and contributes to the attainment of oral and written fluency in Italian.

ITALY: ROME – AME PROGRAM

Semester
Rome Global Gateway and Roma Sapienza
Rome Global Gateway | Via Ostilia, 15 | 00184 Rome | Italy

The Rome Aerospace and Mechanical Engineering (AME) Program is taught by Notre Dame faculty at the Rome Global Gateway in cooperation with La Sapienza. Students will take three AME courses, one Global Gateway course, All Roads Lead to Rome, and one other course of their choice. Proficiency in Italian language is not required; instruction is in English. Participants are approved by the College of Engineering.

ITALY: ROME – ICCS PROGRAM

Semester
The Intercollegiate Center for Classical Studies (ICCS)
ICCS & Duke University in Rome | Via A. Algardi, 19 | 00152, Rome | Italy

A select number of Notre Dame students participate for one semester in the Intercollegiate Center for Classical Studies, a consortium of 90 colleges and universities under the management of Duke University. ICCS provides students with an opportunity in Rome to study ancient history and archaeology, Latin and Greek language and literature, and art history. Applicants must be at least sophomores majoring in classics, classical history, or archaeology, or must be art history majors with a strong classical background. Proficiency in Italian language is not required. Participants are nominated by members of the Notre Dame Classics department. Acceptance into the Rome-ICCS Program is highly selective.
ITALY: ROME UNDERGRADUATE PROGRAM

Semester
John Cabot University (JCU)
Via della Lungara, 233 | 00165 Rome | Italy

Students from all colleges can enroll in classes at John Cabot University, an American university in Rome, which offers courses in art, business, classics, government, history, literature, philosophy, theology, and psychology. All courses are taught in English with the exception of Italian language classes. Many JCU courses have been approved by Notre Dame departments for major credit; however, students must consult with their department to confirm courses for their major and minor. All students are required to have at least one semester of college-level Italian or the equivalent prior to departure and to take one Italian-language course during the semester or year in Rome. For a listing of all courses offered at John Cabot, check the Study Abroad website. Additionally, all students are required to enroll in the course All Roads Lead to Rome taught at Notre Dame’s Global Gateway in Rome. This course is taught by ND faculty on site.

JAPAN: NAGOYA PROGRAM

Semester or Academic Year
Center for Japanese Studies, Nanzan University
18 Yamazato-Cho, Showa-ku | Nagoya 466-8673, Japan

The Nagoya program is designed for Japanese language majors. Students are required to take an 8-credit Japanese course at the appropriate level each semester. Students choose their other courses in the areas of Japanese society, literature, religion, business, economics, and history. Except for Japanese language classes, content courses are taught in English, and the subject matter is often placed in a larger Asian context.

JAPAN: TOKYO PROGRAMS

Spring Semester
Sophia University
Yotsuya Campus | 7-1 Kioi-cho Chiyoda-ku | Tokyo 102-8554, Japan

The exchange program at Sophia University is open to sophomores and juniors who are interested in pursuing either a fully English-taught program or the Japanese language program. Students may choose from a wide variety of courses taught in English, including business and economics, science and technology, and the liberal arts. Prior knowledge of Japanese language is not required for participation on this program. Organized group activities between local and international students enhance the overall experience.

Spring Semester
Keio University
International Exchange Services Group | Office of Student Services | 2-15-45 Mita, Minato-ku | Tokyo 108-8345 Japan

In this exchange program, students may choose to enroll in either the Japanese Language Program (JLP), with a focus on intensive language and culture studies, or the Keio International Program (KIP), with access to content classes taught in English. This comprehensive program is specially designed for exchange students who want to study about Japan and East/Southeast Asia in English and to take Japanese language courses as well. Students with advanced Japanese proficiency may take full-time undergraduate courses taught in Japanese.

JORDAN: AMMAN PROGRAM

Academic Year or Semester
CIEE Center | #1 Rifa Al-Ansari St. | Khalifeh Plaza #505 | PO Box 13434 | Amman, 11942, Jordan

This program is offered in conjunction with the Council for International Educational Exchange (CIEE). Students choose to enroll in an intensive Advanced Arabic language program or Middle East Studies program. Housing options offer living with a host family or in an apartment. Organized group excursions complement the classroom experience. Arabic language classes are required with elective area studies courses offered in English each semester. The Amman program is recommended for Arabic majors.

MEXICO: PUEBLA PROGRAM

Semester or Academic Year
Universidad Popular Autónoma del Estado de Puebla (UPAEP)
21 sur #1103 Barrio de Santiago | CP 72410 | Puebla, Pue, Mexico

Students may participate in the program for an academic year or a semester. The program is open to students from all colleges at Notre Dame with the equivalent of four semesters or better in Spanish language. Notre Dame offers a pre-medical program in the fall semester at UPAEP, which includes the first semester of General Physics (taught in English) and internships with Mexican doctors. Spring students may take courses at the Tec de Monterrey-Puebla and UPAEP and will also have a variety of internship opportunities with a focus on business or the humanities. Excursions are coordinated by on site ND staff. Students live with host families.

MOROCCO: RABAT PROGRAM

Semester
School for International Training (SIT)
Abd el-Halim S. Elhassani, #11 | Rabat Medina, Morocco 10101

Through the School for International Training (SIT), students participate in one of three thematic courses of study: Journalism and New Media; Migration and Transnational Identity; or Multiculturalism and Human Rights. Each track includes a core course that focuses on the specific theme, language study, an independent study project, and program excursions that enrich an understanding of Morocco’s history, development issues, cultural diversity, environmental issues, and questions regarding civil society. During the field study, students identify topics to investigate for the final Individual Study Project. Special program features include living with a host family and engaging in deep cultural and academic experiences through educational excursions.

RUSSIA: MOSCOW, ST. PETERSBURG, AND VLADIMIR PROGRAMS

Semester or Academic Year
American Council of Teachers of Russian (ACTR)
American Councils Main Office | Leninsky Prospect, d2, kom 507 | Moscow, Russia 11709

Students enroll in a Russian language and area studies program through ACTR to study in Moscow, St. Petersburg, or Vladimir for one semester or an academic year. Students should have completed two years of Russian or the equivalent at the university level before participation. Participants take courses in grammar and contemporary Russian language, vocabulary, and conversation, as well as in literature, Russian and Soviet culture, history, politics, and the mass media. Course descriptions are available on the Study Abroad website.

RWANDA: KIGALI PROGRAM

Semester
School for International Training
Kacyiru South, No. 24, KG3 | Gasabo District | Kacyiru Sector, Kamatama Cell | Kigali, Rwanda

Through the School for International Training (SIT), the Post-Genocide Restoration and Peacebuilding program examines the origins of conflict in Rwanda and the challenges and opportunities of post-conflict restoration and peacebuilding. The program combines course work with field study during which students identify topics of interest that they pursue for the final Individual Study Project. Special program features include living with a host family and deep cultural and academic engagement through educational excursions.

SINGAPORE: SINGAPORE PROGRAM

Semester
National University of Singapore (NUS)
21 Lower Kent Ridge Road | Singapore 119077

NUS offers a global approach to education and research, with a focus on Asian perspectives and expertise for select exchange students. NUS is a vibrant English-speaking comprehensive university with 16 faculties/schools offering courses from arts and social science to history and physics. A comprehensive English course list is announced every year and is available online for students to view. Areas of study include arts/design, engineering, English, foreign languages, global studies, health, humanities,
journalism, law, life sciences, other physical sciences, social sciences, and sustainability. Most students at this leading global university live on campus in dormitories.

SOUTH AFRICA: STELLENBOSCH PROGRAM

Semester
Stellenbosch University | Victoria St., Stellenbosch Central | 7602 Stellenbosch, South Africa

Participating in the South Africa program allows Notre Dame students the opportunity to study and live directly alongside their peers at Stellenbosch University through this exchange program. Students attend classes at Stellenbosch University and live with both local students and fellow international students in student dorms. Coursework introduces students to South African society and history by exploring topics such as transitional justice, social identity and inequality, agriculture, and the role of gender from a South African perspective. If interested, students also have the option to take an Afrikaans or isiXosa language course. Though best suited for students in the College of Arts and Letters, opportunities may be available for students in the College of Science and the College of Engineering. Stellenbosch University’s close proximity to Cape Town allows students to explore the varied landscapes of South Africa through numerous organized excursions.

SOUTH KOREA: SEOUL PROGRAM

Semester
Yonsei University
50 Yonsei-ro, Seodaemun-gu | Seoul, Korea 120-749

The Seoul exchange program is open to juniors. It is particularly suited to students in Liberal Arts, Economics, Business, Science, Engineering, Life System, Korean Language, Social Science, and Korean Studies. Yonsei is a private Christian research institution with local and international students and scholars and is one of the oldest universities in South Korea. Yonsei receives students from more than 290 academic institutions worldwide. Instruction is in Korean but students may also choose from many courses that are taught in English. Students may also choose courses from the various other faculties.

SPAIN: ALCOY PROGRAM

Spring Semester
Polytechnic University of Valencia-Alcoy
Campus de Alcoy | Plaza Ferradiz y Carbonell | 03801 Alcoy (Alicante) | Spain

This exchange program accepts Notre Dame undergraduate engineering students to study during the spring semester of their sophomore or junior academic year. The program is designed for undergraduate computer science students. Courses are conducted through the Polytechnic University of Valencia in Alcoy, Spain. Courses are taught in Spanish and the Polytechnic University of Valencia will provide a two-week Spanish refresher course prior to the semester, as needed.

SPAIN: TOLEDO PROGRAM

Semester or Academic Year
Fundación Ortega-Marañón San Juan de la Penitencia | Callejon de San Justo | 45001 Toledo, Spain

The Toledo program is open to sophomores and juniors in all majors. Students may study for a semester or academic year in Toledo and all courses are taught in Spanish. Students must take five courses through the Centro de Estudios Internacionales. A philosophy course is offered in the fall only; a theology course is offered in the spring. Credit-bearing internships are available in Toledo. Students may apply for internships in several areas, including government, the arts, social service, and communications. Credit toward a major must be approved by an advisor in the major department. Students live in a dorm or with host families.

SWITZERLAND: GENEVA PROGRAM

Spring Semester
University of Geneva (UNIGE), CERN
24, rue du Genéral-Dufour | 1211 Geneva 4 | Switzerland

Through Boston University’s Geneva-Physics program, qualified students have the opportunity to study at the world’s leading center for advanced research in particle physics. This program combines upper level coursework in quantum physics and electrodynamics at the University of Geneva (UNIGE), with directed research at the European Organization for Nuclear Research (CERN). Qualified candidates will be upper level Physics major with a minimum of two semesters of college-level French or the equivalent. Additionally, students will be required to enroll in and complete a scientific French-language tutorial during the semester prior to studying abroad. This program is highly selective.

UNIVERSAL STUDY OPTIONS

Table of Contents

34

Study Abroad

Academic Year or Semester
University of St. Andrews
College Gate | St Andrews | KY16 9AJ | Fife, Scotland, UK

The University of St. Andrews is renowned for its academic strength in numerous disciplines but is particularly distinguished in Medieval Studies.
Students with a major, minor, or concentration in Medieval Studies are encouraged to apply. This selective program is open to other majors including psychology and other disciplines for students with a minimum 3.5 cumulative GPA. Students apply in the fall semester of their sophomore year to study at St Andrews in either semester of their junior year.

Detailed information for all study abroad programs can be found at studyabroad.nd.edu. Questions for study abroad can be sent to studyabroad@nd.edu.

DOMESTIC OFF-CAMPUS PROGRAMS

In addition to the study abroad options coordinated by Notre Dame International, there are other off-campus experiences managed by the colleges and departments during the Fall, Spring, and Summer semesters for students to pursue academic interests at locations within the United States.

CALIFORNIA: SILICON VALLEY SEMESTER

Notre Dame California-Silicon Valley Semester
345 Hamilton Ave
Palo Alto, CA 94301

The University of Notre Dame Silicon Valley Semester Program provides an off-campus study program for students interested in a semester-long experience in Silicon Valley, the global center for technological innovation and home to the most dynamic and exciting tech corporations and startups. Our Fall and Spring experiences will focus primarily on these four areas: part-time internship, Silicon Valley centric courses, networking and career development, and experiencing San Francisco and California. More information can be found at https://california.nd.edu/siliconvalley/.

WASHINGTON, D.C.: THE WASHINGTON PROGRAM

Semester
University of Notre Dame Washington Program
1608 Rhode Island Ave NW
Washington, D.C. 20036

The University of Notre Dame Washington Program offers students the ability to study off-campus, becoming immersed in the political and cultural life of Washington DC. In the semester-long program, students take classes focused on politics and policy as well as intern part-time. The Program not only affords students an opportunity to experience big city living and culture, it provides students with a unique opportunity to gain work experience and engage in career discernment. More information can be found at https://washingtonprogram.nd.edu/.

Moreau First Year Experience

“[Education] is the art of helping young people to completeness…”

from Blessed Basil Moreau, Christian Education

The Moreau First Year Experience, a two-semester course sequence, is required of all first-year students. Taught in both fall and spring semesters, and integrating academic, co-curricular, and residential experiences of new students, the course is organized around multiple foci including: orientation to university life, health and wellness, community standards and cultural competence, academic success, spiritual life, and discernment. Students actively engage with the experience through a variety of methods such as large lectures, on-line modules, and small group discussions. Ongoing reflection assignments help students consider their own holistic development in intellectual, cultural, pre-professional, and social pursuits.

The Moreau First Year Experience resonates with the larger framework of the charism of the Congregation of the Holy Cross to educate in the faith. Similarly, drawing on the pedagogy of Blessed Basil Moreau, it builds upon the Five Pillars of a Holy Cross Education:

- **Mind:** seeking understanding through the integration of faith and reason
- **Heart:** discerning one’s personal vocation in service to the Church and the world
- **Zeal:** enkindling the desire to use one’s gifts to boldly proclaim God’s Word
- **Family:** embracing Christian community as the context for lifelong formation
- **Hope:** trusting in the Cross and God’s promise of the kingdom

Through the Moreau First Year Experience, students come to understand the complexity and expectations of the Notre Dame community; take advantage of crucial academic and university resources; cultivate and maintain a healthy and well-balanced lifestyle; become aware of and engage with diverse communities; and think deeply about their academic, creative, professional and spiritual lives. The Moreau First Year Experience gives students the opportunity to begin forming life-long habits of the mind as well as an engagement in faith, service, arts, wellness, and community.

The First Year Experience is a collaborative effort between the Center for University Advising and the Division of Student Affairs. The course speaks to the imperatives of the University Strategic Plan for Undergraduate Education by ensuring that Catholic culture informs an integral part of new students’ education; by nurturing the formation of students’ mind, body, and spirit; by enriching the integration of students’ intellectual, extracurricular, and residential experiences; and by deepening students’ global engagement. The Moreau First Year Experience affirms the diversity and inclusion of the all first-year students.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject First Year of Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

Information Technologies

The Office of Information Technologies (OIT) is the central division that supports enterprise-wide computing on campus. It provides the products and services that you will use every day to complete tasks related to your studies and jobs.

Notre Dame provides students with an @nd.edu email account hosted by Google. Google also provides students with Google Apps and unlimited storage.

Each student living in undergraduate residence halls and graduate student residences has access to a dedicated ethernet jack, and wireless is available throughout campus.

A distributed cellular antenna system (DAS) in various campus locations provides enhanced coverage for major cellular telephone providers, including AT&T, Verizon and Sprint.

Printers are located in each residence hall, many computer labs and other key campus locations. Undergraduate students receive a print quota each academic for printing on PrintND printers. Additional quota can be purchased if needed.

The OIT supports computer labs across campus. Students, faculty, and staff have access to these labs that contain both Windows and Mac computers.

The OIT Help Desk can provide assistance to students with computer questions, as well as questions about supported software applications, network configuration, operating system, file storage, etc. Located at 115 DeBartolo Hall, as well as by phone, email or chat.

In addition, the OIT has an extensive IT knowledge-base to help you find answers to your questions quickly and easily with a convenient search feature, and is available 24/7.

Students and faculty can also take advantage of a variety of media services through Notre Dame Studios. These services include video streaming, video and audio production, and post-production services, including media duplication.

Audio Video Technologies works closely with the Office of the Registrar to design, build and support technology-enhanced learning spaces on campus. There are many classrooms equipped with audio...
video systems that allow students, faculty and guests
to present information from a variety of digital
sources. Audio and video conferencing are also
available to students.

For classroom presentations or projects, students
can check out a variety of audio-visual equipment
(cameras, audio recorders, microphones, projectors, etc.) at no charge from the OIT Help Desk.

Computer training classes are available to students
at no charge through the OIT on a wide range of
software and applications.

In addition to mainstream computing services, the
OIT, in partnership with the Office of Research,
works with the Center for Research Computing
(CRC) to support computationally intensive work,
large dataset management, and data visualization
for the undergraduate, graduate and campus research
communities. The University provides access to
national supercomputing and data resource facilities
via Internet2. It provides high bandwidth access
to about 200 leading research universities and
supercomputing centers.

Anyone using Notre Dame computers and network
resources must comply with guidelines set forth in
the Responsible Use of Data & Information Technology
Resources Policy.

For complete information about OIT services and
how to obtain them go to: oit.nd.edu.

The Meruelo Family Center for Career Development

Formerly known as the Career Center, The Meruelo
Family Center for Career Development supports
Notre Dame students in all stages of the career
development process. Through innovative and
tailored programs, opportunities, services, and
strategic partnerships, we prepare and help students
build the skills to obtain strong career outcomes after
their time at Notre Dame.

OUR SERVICES

One-on-One Appointments
Our career consultants and counselors meet with
students to assist with self-assessment, career
decisionmaking, industry exploration, resumes, cover
letters, job and internship searches, and interviewing.
Appointments can be scheduled through Handshake
and 15-minute walk-in appointments are available
Monday through Friday, 2:00-4:00pm.

Workshops and Learning Labs
Our career counselors/consultants host career
development skill building workshops on numerous
topics from resumes, CVs, to networking, industry
specific, and strategic job search.

A sampling of workshops include:

- Writing Your First Resume
- Career Fair Prep
- Alumni Insight Series
- Utilizing LinkedIn
- Interview Prep

On-Campus Recruiting and Handshake Database
Handshake is the University of Notre Dame’s cen-
tralised career management platform where students
can research employers, search for internships and
full-time jobs, network with other students and
employers, schedule career counseling appointments,
RSVP for workshops and events, and much more.

Career Development Online Resources
Online career resources such as professional docu-
ments (resumes, cover letters, CV’s) as well as job
and internship databases are available through the
career development websites.

Career Experiential Education Programming
- Career Treks
- Mentoring Programs
- Arts and Letters Corporate Industry Boot Camp
- Interview Skills Development
- First Generation Careers Initiative
- Consulting Connect

Internship Funding Program
This program is designed to aid students who wish
to enter into an internship whose pay does not meet
the standard cost of living. The Center for Career
Development provides financial awards assisting
students with living expenses while participating in
time-paid and unpaid internships or research.

For additional information, contact:
The Meruelo Family Center for Career Development
504 Duncan Student Center
Notre Dame, Indiana 46556
(574) 631-5200
careerdevelopment.nd.edu
careerdevelopment@nd.edu

Hours of Operation
- Monday–Friday: 8:00 am to 5:00 pm
- 15-minute walk-in appointments are available
when regular classes are in session. Check out our
website for the most up-to-date information.

Old College provides an introduction to religious
life and ministry in Holy Cross through participation in
daily Eucharist and prayer, service placements, spiri-
tual direction, weekly community nights, retreats, and
academic preparation, including courses in philosophy
and theology. Students can select their own major and
tailor the rest of their academic program according
to their interests. Old Collegians take all classes with
other Notre Dame students and actively participate in
clubs, organizations, and other aspects of campus life.
They are also encouraged to spend a semester or year
abroad. Old College combines a challenging religious
formation structure with a complete Notre Dame
undergraduate experience.

Moreau Seminary, also located on the Notre Dame
campus, is the primary formation house for the
Congregation of Holy Cross in the United States.
The one-year Postulant Program is a pre-novitiate
year designed for those with a bachelor's degree in
any field who discern a vocation to brotherhood or
priesthood within vowed religious life. Postulants
typically take 15 hours of philosophy and/or theol-
ogy credits at the University each semester, and have
ministry placements supervised by seminary staff.
Postulants reside at Moreau Seminary with other
priests, brothers, seminarians, and scholastics. They
discern their vocation through spiritual direction
and active participation in the community life of
Moreau Seminary, which is centered around the
daily celebration of the Eucharist and the Liturgy of
the Hours. After returning from the Novitiate, newly
professed seminarians and scholastics begin their
formal academic training in the Master of Divinity
program at Notre Dame.

Applicants to Old College and Moreau Seminary
must be practicing Roman Catholics in good stand-
ing with the Church and of solid personal character,
with a demonstrated commitment to apostolic min-
istry. Admission is selective, and personal interviews
are required for acceptance into both programs.
Tuition scholarship assistance is provided.

For additional information, please contact:
Director, Office of Vocations
PO Box 541
Notre Dame, IN 46556
vocation.1@nd.edu
holycrossvocations.org
574-631-6385

Saint Mary’s College.

Because of the proximity and rich tradition common
to Notre Dame and Saint Mary’s, the two institu-
tions share many activities in the area of academics
as well as social events, student organizations, and
community service projects. The two institutions
maintain a cooperative program permitting a limited
number of courses to be taken at the neighboring
institution.
The Office of First Year Advising and Academic Initiatives

**Director:**
Katrina Higgins  

**Advisors:**
Samantha Cloon; James Creech; Drew Espereth; David Griffith; Mallory Jagodzinski; Eve Kelly; Kristian Las-Walker; Erin Lemrow; Cecilia Lucero; Katharine Mahon; Holly Martin; Sarah Priebe; Ardea Russo; Kasey Swanke; Melvin Tardy; Leonor Wangensteen; Michelle Ware

**Director, Learning Resource Center:**  
Nahid Erfan  

**Director, Program for Academic Excellence:**
Philip Sakimoto

**OVERVIEW**

The Office of First Year Advising serves as the advising nexus for incoming first-year students. It utilizes an integrative paradigm for student engagement. Discernment, exploration, and academic planning are the essential touchstones for its work. Student-centered advising is one of the hallmarks of a Notre Dame education. Students are encouraged to think of their intellectual growth along a four-year arc, with required and elective courses providing an educational experience with substantial breadth and depth.

First Year Advisors challenge students to: think carefully about how to make the most of their learning opportunities; hone existing talents; acquire new competencies; and cultivate areas of specialization that reflect both their interests and passions. They also assist students in working toward realization of nine learning outcomes. Collectively, these objectives aim to help students communicate effectively; formulate appropriate learning goals and strategies; become good decision makers; gain proficiency in academic planning; engage in learning self-assessment; become integrative thinkers; develop resilience; prepare to become life-long learners; and cultivate those capacities requisite for discernment.

Starting in their first-year, students select courses that reflect their college or school intent, likely major (if already determined), emerging interests, and the University's Core Curriculum. The goal of the Core Curriculum is to expose students to various intellectual modalities for comprehending and interacting with the larger world. These eleven "ways of knowing" are intellectual pathways reflective of several of the University’s “Learning Outcomes for Undergraduates.” The process of building such a schedule is undertaken with the assistance of members of our first-year advising teams. Specific information on course options for first-year students is found on the First Year Advising website at https://firstyear.nd.edu/academics/.

**MOREAU FIRST YEAR EXPERIENCE**

A distinctive feature of our undergraduate curriculum is the Moreau First Year Experience, which exposes students to the values informing a Catholic education in the tradition of the Congregation of Holy Cross. Details can be found online at https://corecurriculum.nd.edu/moreau-first-year-experience/

**VOLUNTARY COURSES**

Each year, the Office of First Year Advising offers a number of voluntary courses for first-year students.

**ADVANCED PLACEMENT EXAMINATIONS—NOTRE DAME CREDIT**

<table>
<thead>
<tr>
<th>Advanced Placement Exam</th>
<th>AP Grade Required</th>
<th>Number of Credits Awarded</th>
<th>Notre Dame Equivalent Course</th>
<th>Notre Dame Exam Course Credited (if different)</th>
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<tr>
<td>Biology</td>
<td>5</td>
<td>8</td>
<td>Biological Sciences 10161 and 10162</td>
<td>Biological Sciences 10098 and 10099</td>
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<td>Biological Sciences 10091</td>
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<td>Mathematics 10091</td>
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<tr>
<td>Calculus BC</td>
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<td>Mathematics 10550 and 10560</td>
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<td>Writing and Rhetoric 13100</td>
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Those projected to be offered in Academic Year 2020–21 can be found on the First Year Advising website at https://firstyear.nd.edu/academics/courses/areas/voluntary/

**CREDIT AND/OR PLACEMENT BY EXAMINATION**

Up-to-date information on Advanced Placement (AP), International Baccalaureate (IB), and other forms of exam-based course credit pertinent to first-year students is maintained on the First Year of Studies website at https://firstyear.nd.edu/academics/advanced-placement-credit/ Synoptic charts of exams and equivalences appear below.

To Table of Contents
## ADVANCED PLACEMENT & SAT II SUBJECT TESTS FOR FRENCH, GERMAN, ITALIAN, AND SPANISH

<table>
<thead>
<tr>
<th>SAT-II Subject Test Score</th>
<th>Advanced Placement Test Score</th>
<th>Credits (Courses)</th>
<th>Placement Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>French and French with listening</td>
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<td></td>
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<tr>
<td>790–800</td>
<td>5</td>
<td>6 (20201-20202)</td>
<td>30310 or 30320</td>
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<tr>
<td>690–780</td>
<td>4</td>
<td>6 (20201-20202)</td>
<td>20600 or 20300</td>
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<tr>
<td>590–680</td>
<td>3</td>
<td>7 (10102-20201)</td>
<td>20202</td>
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<tr>
<td>490–580</td>
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<tr>
<td>480</td>
<td>1</td>
<td>4 (10101)</td>
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<tr>
<td>German and German with listening</td>
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<tr>
<td>790–800</td>
<td>5</td>
<td>7 (10102-20201)</td>
<td>20202 or 30000+</td>
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<td>4 (10101)</td>
<td>10102</td>
</tr>
<tr>
<td>Italian and Italian with listening</td>
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<tr>
<td>790–800</td>
<td>5</td>
<td>6 (20201-20202)</td>
<td>30310</td>
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<td>690–780</td>
<td>4</td>
<td>7 (10102-20201)</td>
<td>20202</td>
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<td>590–680</td>
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<td>8 (10101-10102)</td>
<td>20201 or 20215</td>
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<tr>
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<td>4 (10101)</td>
<td>10102</td>
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<tr>
<td>Spanish and Spanish with listening</td>
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<td>800</td>
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<td>20600</td>
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<tr>
<td>570–680</td>
<td>3 (lang.)/2 (lit.)</td>
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<td>1 (lang.)</td>
<td>4 (10101)</td>
<td>10102 or 10115* or 10110*</td>
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</table>

*If you have received credit for 10101 and you choose to take 10110 or 10115, the AP/SAT-II credit you received for 10101 will still show on your transcript, but will no longer count in the total credits required to earn the degree. This is because the course content of 10110 and 10115 incorporates the content of 10101.

## INTERNATIONAL BACCALAUREATE—NOTRE DAME CREDIT

<table>
<thead>
<tr>
<th>IB Higher Level Exam</th>
<th>Grade Required</th>
<th>Number of Credits Awarded</th>
<th>Notre Dame Equivalent Course</th>
<th>Notre Dame Exam Course Credited (if different)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biology</td>
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<td>6</td>
<td>Biological Sciences 10101 and 10107</td>
<td>Biological Sciences 10091 and 10097</td>
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<tr>
<td>Chemistry</td>
<td>6</td>
<td>3</td>
<td>Chemistry 10101</td>
<td>Chemistry 10091</td>
</tr>
<tr>
<td>Mathematics</td>
<td>7</td>
<td>8</td>
<td>Mathematics 10550 and 10560</td>
<td>Mathematics 10091 and 10092</td>
</tr>
<tr>
<td>Physics</td>
<td>6</td>
<td>6</td>
<td>Physics 10111 and 10222</td>
<td>Physics 10091 and 10092</td>
</tr>
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<td>Psychology</td>
<td>6</td>
<td>3</td>
<td>Psychology 10000</td>
<td>Psychology 10091</td>
</tr>
<tr>
<td>Social and Cultural Anthropology</td>
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<td>3</td>
<td>Anthropology 10109</td>
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<td>Notre Dame Course</td>
<td>Course Title</td>
<td>Notre Dame Exam Course Credited</td>
<td>Qualifying Score</td>
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<tr>
<td>ACMS 10145</td>
<td>Statistics for Business I</td>
<td>ACMS 10091</td>
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<tr>
<td>MATH 10250</td>
<td>Elements of Calculus I</td>
<td>MATH 10090</td>
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<td>MATH 10550</td>
<td>Calculus I</td>
<td>MATH 10091</td>
<td>80%</td>
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<td>MATH 10560</td>
<td>Calculus II</td>
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<td>MATH 10093</td>
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<tr>
<td>MATH 20580</td>
<td>Introduction to Linear Algebra and Differential Equations</td>
<td>MATH 10094</td>
<td>80%</td>
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</tr>
</tbody>
</table>
School of Architecture

Francis and Kathleen Rooney Dean of the School of Architecture:
Stefanos Polyzoides

Associate Dean:
John W. Stamper

Associate Dean for Research, Scholarship, & Creative Work:
Krupali Krusche

Adjunct Professor:
Rev. Richard S. Bullene, C.S.C.

Assistant Dean for Graduate Studies:
Samantha L. Salden Teach

Director of Graduate Studies:
Richard Economakis

Adjunct Associate Professor:
Robin Rhodes

Adjunct Associate Teaching Professor:
Brian Smith

Assistant Dean and Academic Director/Rome Studies Program:
Marianne Cusato; Frank Hudorwitz; Todd Zeiger

Visiting Professor:
Richard Piccolo

Concentrations in furniture design, in historic preservation and restoration, and in architectural practice and enterprise, are options within the undergraduate degree program.

To Table of Contents
School of Architecture

Concentrations are declared at the end of the third year. The National Architectural Accrediting Board requires B. Arch students to take at least 45 credit hours outside of architecture. Students taking electives in architecture, either within a concentration or as random electives, may need additional credits outside of architecture to meet the minimum of 45.

All third-year undergraduate students spend the academic year in the School’s Rome Studies Center in Italy. All graduate students spend a semester there. Some limited scholarship aid is available for the additional expenses incurred in Rome.

The initial phase of undergraduate architectural study is devoted to acquiring basic design and technical skills and developing an understanding of architectural concepts by learning canonical forms of classical architecture and applying them to design problems of increasing scale and complexity. This beginning study is reinforced in the third year, spent in Rome, where 2,500 years of building tradition provide the context for contemporary design problems. Fourth-year students return to Notre Dame, where they are reintroduced to the American context. At this stage, students are encouraged to synthesize their interpretations of the historical legacy in the context of American urban centers and small cities. They are also challenged by projects that require them to engage architectural problems outside their Western focus. The undergraduate program culminates with a thesis design project completed in the fifth year.

In addition to studio instruction, students complete course work in structural, mechanical, and environmental systems and architectural history. History and theory courses in the School of Architecture include a two-semester survey of the history of architecture from the earliest times to the present and specialized upper-level course work in selected topics involving the history and theory of architecture.

Students are in contact with practicing professionals through collaboration between the School of Architecture and the Northern Indiana Chapter of the American Institute of Architects. The School of Architecture has an active chapter of the American Institute of Architects. The School of Architecture and the Northern Indiana Chapter of the American Institute of Architects have established a joint scholarship for Architecture and other scholarly disciplines in Rome.

Richard H. Driehaus Prize in Classical Architecture. Richard H. Driehaus, the founder and chairman of Driehaus Capital Management in Chicago, initiated the Richard H. Driehaus Prize in Classical Architecture to honor a major contributor in the field of traditional and classical architecture or historic preservation. In 2004, he initiated the Henry Hope Reed prize to recognize outstanding contributions to the welfare of the traditional city and its architecture. The prizes were established through the University of Notre Dame’s School of Architecture because of its reputation as a national leader in incorporating the ideals of traditional and classical architecture into the task of modern urban development.

UNDERGRADUATE CURRICULUM

First Year

First-year students intending to major in architecture take the following courses. Courses in italics need not be taken in the semester in which they are shown.

<table>
<thead>
<tr>
<th>Course</th>
<th>First Semester Credits</th>
<th>Second Semester Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing and Rhetoric/</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>University Seminar</td>
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<td></td>
</tr>
<tr>
<td>MATH 10250 and 10270*</td>
<td>3</td>
<td>3</td>
</tr>
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<td>PHYS 10111*</td>
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<tr>
<td>History or Social Science</td>
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<tr>
<td>or &quot;Integration&quot; course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARCH 11011. Graphics I: Drawing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ARCH 11021. Graphics II: Drafting</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>ARCH 10311. Analysis of Architectural Writings</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Moreau First Year Experience</td>
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<td>1</td>
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</table>

The courses listed below indicate the normal sequence for sophomore, junior, senior, and fifth year students majoring in architecture. Courses in italics need not be taken in the semester listed.

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ARCH 21111. Design I</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 20411. Building Technology I</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 20211. Architectural History I</td>
<td>3</td>
</tr>
<tr>
<td>Theory 1. Foundational</td>
<td>3</td>
</tr>
<tr>
<td>Philosophy I: Introductory</td>
<td>3</td>
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</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 21121. Design II</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 20221. Architectural History II</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 20511. Structural Mechanics for Architects</td>
<td>3</td>
</tr>
<tr>
<td>ROIT 10110. Beginning Italian*</td>
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</table>

Junior Year (Rome Studies Program)

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ARCH 34112. Design III</td>
<td>6</td>
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<tr>
<td>ARCH 34312. Architectural History III</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 34212. Roman Urbanism and Architecture I</td>
<td>3</td>
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<tr>
<td>ARCH 34012. Advanced Graphics: Freehand Drawing</td>
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</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ARCH 34122. Design IV</td>
<td>6</td>
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<tr>
<td>ARCH 34322. Architectural History IV</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 34222. Roman Urbanism and Architecture II</td>
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<tr>
<td>ARCH 34022 Advanced Graphics: Watercolor</td>
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Senior Year

First Semester

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<tr>
<th>Course</th>
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<tr>
<td>ARCH 40411. Environmental Systems I</td>
<td>3</td>
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<tr>
<td>ARCH 41111. Design V</td>
<td>6</td>
</tr>
<tr>
<td>ARCH 41011. Graphics V: Computers</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 40511. Structural Design for Architects</td>
<td>3</td>
</tr>
</tbody>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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</thead>
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<tr>
<td>ARCH 41121. Design VI</td>
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<tr>
<td>ARCH 40421. Building Technology II</td>
<td>3</td>
</tr>
<tr>
<td>ARCH 40521. Applied Structural Systems</td>
<td>3</td>
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<tr>
<td>2nd Philosophy or a Catholicism in the Disciplines course</td>
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Elective

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<tbody>
<tr>
<td>Elective</td>
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</table>

To Table of Contents
**Fifth Year**

**First Semester**
- ARCH 51111. Design VII 6
- ARCH 50419. Environmental Systems II 3
- 2nd Theology: Developmental 3
- Elective 3

Total for five years: 165 semester hours.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject **Architecture**. Course descriptions can be found by clicking on the subject code and course number in the search results.

### Student Awards and Prizes

**Frank Montana Rome Scholarship Award.** Recipients are selected by the dean, second-year design faculty and the office of financial aid. The Montana scholarships were endowed by Prof. Frank Montana, chair of the Department of Architecture for 25 years and founder of the Rome program. The scholarships are for tuition assistance in connection with the Notre Dame Rome Studies Program.

**Nelle Wynn Kervick Award for Design and Drawing.** Founded by Prof. Francis W. Kervick, former head of the School of Architecture in memory of his mother, this award, selected by the Rome Studies studio faculty, honors the student whose work in freehand drawing in the third year of study has been of the highest merit.

**Alice Wesołoski Scholarship.** For her decades of service to the School of Architecture, this award was established in honor of Ms. Wesołoski. Selected by the faculty and the Office of Financial Aid to provide tuition assistance to a student of particular ability, character and need.

The **Association of Licensed Architects Undergraduate Student Merit Award.** Selected by the fifth-year faculty, the ALA Undergraduate Student Merit Award goes to a graduating student recognized for exemplary achievements throughout the scholastic year.

**Brian Crumlish Scholarship.** Selected by the faculty, the Brian Crumlish Scholarship is awarded to the student who has displayed outstanding academic achievement in Building Technology and Structural Mechanics during the second year of study, and the Building Technology II and Structural Design during the fourth year of study.

**Alliance Architects Scholarship.** Selected by the faculty and the Office of Financial Aid to provide tuition assistance to minority students of particular ability and character.

**Ray Stuermer Memorial Award for Excellence in Design.** Given in memory of former Professor Ray Stuermer, this award, selected by faculty, is given on the basis of design work through the fourth year for overall improvement and design excellence.

**Ruiz Award for Excellence in Accessibility Design.** Awarded to a rising fifth-year student to recognize overall improvement and design excellence.

**Stuermer Award.** Given in memory of former Professor Ray Stuermer, this award, selected by the fifth-year thesis jurors, is given to the student whose work is well designed, demonstrates an ability with respect to architecture and urbanism.

**Norman A. Crowe Award.** Given to a graduating student for their contributions to the idea of sustainability with respect to architecture and urbanism. Selected by the dean and faculty.

**Dean’s Award for Design Excellence in Architecture.** Selected by the fifth-year thesis jurors and the dean, this award goes to overall excellence in a fifth-year thesis project.

**Rome, Paris, Athens Prize.** Selected by the fifth-year thesis faculty and the dean, this award is for the scope of exploration and the quality of individual buildings that successfully unite architecture and urban design.

**The Noel Blank Design Awards.** Founded by Leon W. Blank in memory of his brother, Noel, this high honor goes to the top two thesis projects as selected by the fifth-year thesis jurors.

**Rambusch Prize in Religious Architecture.** The Rambusch Prize is awarded to a graduating student for the best solution to a problem related to a religious architecture project.

**Tau Sigma Delta Bronze Medal Winner.** The Tau Sigma Delta medal is awarded to a graduating student selected by his or her peers in recognition of design excellence.

**The St. Joseph Award in Furniture.** Selected by the furniture design professor for excellence in furniture design and construction.

**Ralph Thomas Sollitt Award.** Founded in 1931 by Ralph Sollitt and Sons Construction Co., this award, selected by the fifth-year thesis jury, is given to the student who submits the best design as a solution to the thesis architecture problem.

**Ferguson and Shamamian Undergraduate Prize.** The prize is selected by the jury to recognize superior achievement in classical design for a thesis project and the related investigation of an architectural idea that may serve as an enduring source of architectural inspiration.

**Gertrude S. Sollitt Prize for Architectural Structure.** Founded in 1931 by Ralph Sollitt and Sons Construction Co., this award, selected by the School’s jury, goes to the student who submits the best work as a solution to a special problem in structure assigned in the scholastic year.

**Walsh Family Hall Civic Award in Architecture and Urbanism.** Given to a graduating student for contribution to a culture of environmental sustainability and civic virtue within the School of Architecture.

**Jane Jacobs Award.** Selected by the thesis faculty and the dean, this award is for demonstrated commitment to community and urban planning.

**Liang Su-Cheng Award.** Selected by the fifth-year thesis jurors and the dean, this award recognizes excellence in non-Western architecture.

**Michael and Julie Hanahan Architecture Prize.** Selected by the students, this prize recognizes overall excellence in the study of architecture.
Henry Adams Medal. This American Institute of Architecture (AIA) award honors the graduating Bachelor of Architecture and Master of Architecture student who has the highest grade-point average for the complete course of study.

David M. Schwarz Architects, Inc. Internship and Traveling Fellowship Award. A ten-week paid internship for a fourth-year student and for a graduate student entering the last year of the graduate program with David M. Schwarz Architects, Inc. and a one-month travel fellowship involving independent research and study.

Ferguson & Shamamian Graduate Prize. The prize is selected by the jury to recognize superior achievement in classical design for a thesis project and the related investigation of an architectural idea that may serve as an enduring source of architectural inspiration.

Dean’s Graduate Award for Design Excellence in Architecture. Selected by the graduate thesis jurors and the dean, this award goes to overall excellence in a graduate thesis project.

The Association of Licensed Architects Graduate Student Merit Award. Selected by the graduate faculty, the ALA Graduate Student Merit Award goes to a graduating student recognized for exemplary achievements throughout the scholarly year.

Leon Battista Alberti Award. For the graduating student with the highest grade-point average for the complete course of study in the post-professional degree program.

Student Organizations

The American Institute of Architecture Students – Notre Dame Chapter (AIAS-ND). The American Institute for Architecture Students chapter at the University of Notre Dame enlivens the educational and social life of Walsh Family Hall of Architecture. AIAS-ND enhances the educational process by scheduling visits to active construction sites on campus with the cooperation of the University Architect and inviting guest speakers from nearby AIA chapters. AIAS-ND encourages the culture of hand-drafting and watercolor rendering at the School with an architectural supply closet so members can get what materials they need conveniently and at a discounted rate. In addition to these educational aspects, the club sponsors trips to national and regional events, plans interclass mixers, and holds an annual Beaux Arts Ball in the spring. The goal of AIAS-ND is to spur conversation, curiosity, and passion in this chosen field of study.

The Frank Montana Sketching Club of Notre Dame (FMSCND). The Frank Montana Sketching Club was founded in 2016 to encourage the passion and scholarly collaboration that results from drawing and sketching. Inspired by the travel paintings done abroad by Frank Montana, the Club seeks to instill a love of drawing cultivated not only at school and while in Rome, but throughout one’s life. All students at Notre Dame are welcome, and the School of Architecture will be the general headquarters for the club’s main activities, including: visits to the Snite Art Museum, sketching and measuring buildings on campus, lectures, and social events.

The National Organization of Minority Architecture Students – Notre Dame (NOMAS-ND). The National Organization of Minority Architecture Students is an organization established to support and encourage students of different races, genders and sexual orientations. NOMAS-ND provides mentorship as well as interaction with NOMAS clubs at other schools across the country. The goal of the club is to give minority students a sense of community and provide role models to encourage, inspire, and provide them with a sense of belonging in the field of architecture.

Student Association for Women in Architecture – Notre Dame (SAWA-ND). Student Association for Women in Architecture was founded in 2007 by Mollie Code and Danielle Potts through a grant from the Beverly Willis foundation. The club is open to both undergraduates and graduates in the School of Architecture who support the presence of women and promote gender equality in the industry. SAWA meets throughout the academic year with faculty to discuss current topics relating to the field, foster inter-class mentoring relationship between student, and host panel lectures.

Students for Classical Architecture – Notre Dame (SCA-ND). Students for Classical Architecture's Notre Dame Chapter is a student group focusing on classical architecture in the architectural practice and education of the 21st century. The club’s mission statement is as follows: Architecture has its roots in hundreds of years of tradition. Yet, it is common in today's architectural academies that the teaching of this tradition be willfully neglected. As students, we want to learn the fundamentals that have arisen from this tradition so that we might incorporate those principles into our own, contemporary, architecture. SCA will promote discussion regarding how best to incorporate architectural fundamentals into a contemporary curriculum. The Students for Classical Architecture will also support local chapters of this organization at all institutions of higher learning. It is our hope that collaboration between these chapters will encourage dialogue between their respective academic programs, fostering a gradual rebirth of tradition in education.

Students for New Urbanism – Notre Dame Chapter (SNU-ND). Students for New Urbanism (SNU-ND) provides education on the New Urbanist planning approach. The chapter also supports New Urbanism initiatives in the local community. Recently SNU-ND worked with the city of South Bend to develop a renovation plan for the city's Ravina Park. The club also supports student participation in city forums related to downtown revitalization projects including the St. Joseph County Public Library renovation and the South Bend Riverfront redesign.

Every year, the club brings planners, architects, and real-estate personnel to give lectures and engage in discussion with the Notre Dame students and faculty to encourage thought and enthusiasm for traditional city-planning.

Tau Sigma Delta. In 1961 the Sigma Chapter of Tau Sigma Delta, the national architectural honor society, was established at Notre Dame. The constitution of Tau Sigma Delta stresses as its sole function the encouragement of high scholastic standing. Election to membership is limited to the top 20 percent of the students in the School of Architecture who have completed 60 percent of their requirements for the professional degree.

Advisory Council

RON B. BLITCH
New Orleans, LA

JOHN H. BURGEE
Santa Barbara, California

CALLA CHANG
San Francisco, California

MICHAEL D. CHESSER
Camarillo, California

RICHARD H. DRIEHAUS
Chicago, Illinois

GABRIEL JACOBS
Chicago, Illinois

HOLLY L. MIZELLE JOHNSON
Atlanta, Georgia

MARTIN G. KNOTT
Easton, Maryland

THERESA SMITH KORTH
Westfield, New Jersey

DAVID P. MANFREDI
Boston, Massachusetts

KEVIN J. MULHALL
Glenside, Illinois

TIMOTHY L. PANZICA
Chagrin Falls, Ohio

MARK PULTE
Bloomfield Hills, Michigan

MICHAEL G. RYAN
Minneapolis, Minnesota

MARIA SÁNCHEZ
Ciudad de Guatemala, Guatemala

JOHN FRANCIS TORTI
Washington, D.C.

ROBERT E. TURNER
Berwyn, Pennsylvania

MATTHEW M. WALSH
Burr Ridge, Illinois

MARK T. WIGHT
Chicago, Illinois

To Table of Contents
College of Arts and Letters

The College of Arts and Letters is the oldest, and traditionally the largest, of the four undergraduate colleges of the University of Notre Dame. It houses 21 departments and several programs through which students at both undergraduate and graduate levels pursue the study of the fine arts, the humanities and the social sciences.

Liberal Education. The College of Arts and Letters provides a contemporary version of a traditional liberal arts educational program. In the college, students have the opportunity to understand themselves as heirs of a rich intellectual and spiritual tradition and as members of a complex national and international society. The faculty of the college are committed to life of the mind, to the critical and constructive engagement with the whole of human experience. On the basis of a firm yet broad foundation, graduates of the college are equipped for a lifetime of learning in an ever-changing world. The overall curriculum and the specific major programs encourage students to approach issues reflectively, to analyze them carefully and to express their reasoned conclusions with clarity.

The intellectual quest conducted in the College of Arts and Letters takes place in an explicitly Catholic environment. Here ultimate questions of the meaning and value of human life before God are welcome, and efforts to deal with such questions utilize the immense resources of the Catholic tradition. Inquiry and faith are seen not as opposing forces but as complementary elements of the fully human pursuit of truth.

Organization. The college’s administrative center is the Office for Undergraduate Studies, located in 104 O’Shaughnessy Hall. All undergraduates in Arts and Letters are invited to consult with the assistant deans regarding questions about their academic progress, educational and career goals, and any other concerns of an academic or administrative nature. Pre-health and pre-graduate school advising are available in this office. In particular, sophomores in the college who have not yet declared a major should begin their pursuit for academic advising in this office. In particular, sophomores in the college who have not yet declared a major should begin their pursuit for academic advising in this office.

Because education is not limited to the classroom, the college also sponsors or helps to subsidize events which are intended to enrich the undergraduate experience and facilitate faculty-student interaction both on and off campus.

Curricula and Degrees. The College of Arts and Letters offers curricula leading to the degree of bachelor of fine arts in Art (Studio and Design) and of bachelor of arts in:

- Africana Studies
- American Studies
- Anthropology

- Art
- Art History
- Art Studio
- Design

- Classics:
  - Arabic
  - Classics
  - Greek
  - Latin

- Greek and Roman Civilization
- Computer Science
- East Asian Languages & Cultures:
  - Chinese
  - Japanese

- Economics
- International Economics—Arabic
- International Economics—Chinese
- International Economics—German
- International Economics—Japanese
- International Economics—Romance Languages
- International Economics—Russian

- English
- Film, Television, and Theatre
- Gender Studies
- German and Russian Languages and Literatures:
  - German
  - Russian
- History
- Irish Language and Literature
- Mathematics (honors only)
- Medieval Studies
- Music
- Neuroscience and Behavior
- Philosophy
- Philosophy/Theology (joint major)
- Political Science
- Program of Liberal Studies
- Psychology
- Romance Languages and Literatures:
  - French and Francophone Studies
  - Italian
  - Romance Languages and Literatures
  - Spanish
  - Sociology
  - Theology

The college also offers supplementary majors, but not stand-alone first or degree-yielding majors, in:

- Africana Studies (24 hours)
- Arts and Letters Pre-health Studies (49 hours)
- Art History (24 hours)
- Asian Studies (24 hours)
- Chinese (24 hours)
- Classics (24 hours)
- French and Francophone Studies (24 hours)
- Gender Studies (24 hours)
- German (24 hours)
- Greek and Roman Civilization (24 hours)
- Irish Language and Literature (24 hours)
- Italian (24 hours)
- Japanese (24 hours)
- Latino Studies (24 hours)
- Medieval Studies (24 hours)
- Peace Studies (24 hours)
- Russian (24 hours)
- Spanish (24 hours)
- Theology (25 hours)

Admission Policies. Admission to the College of Arts and Letters takes place at the end of the first year. The student body of the College of Arts and Letters thus comprises sophomores, juniors and seniors.

A prerequisite for admission of sophomores into the College of Arts and Letters is good standing at the end of the student's first year.

The student must have completed at least 26 credit hour. A student who does not meet these conditions is retained in the First Year of Studies until the conditions are met. The deficiencies must be removed at the Notre Dame Summer Session or in the student's third semester at Notre Dame.

Advanced Placement / International Baccalaureate Credit:

The University will not accept AP/IB credit in lieu of University Core requirements. Similarly, the College of Arts will not accept AP/IB credit in lieu of College requirements. Certain departments will accept AP/IB credit in lieu of major or minor requirements. See the individual department entries for specific details. AP/IB scores may also be used in lieu of a departmental placement exam to place students into upper-level courses.

Degree Requirements for the College of Arts and Letters

Students in the College of Arts and Letters are required to complete 122 degree-countable credits. They must also complete all University and College requirements as well as the requirements for one major program of study.

Multi-Counting: College and University requirements are intended to expose students to a broad range of fundamental courses in multiple disciplines or “ways of knowing” deemed essential for a liberal arts education within the context of a Catholic university. Exposure to these disciplines is normally defined as taking a limited number of courses (typically one or two) within that field or way of knowing. Hence, the College offers a generous multi-counting policy between a student’s major(s) or minor(s) and college and/or university general requirements. That is, students will be able to multi-count a course taken to satisfy a college requirement and to fulfill a
University core requirement. Moreover, students will be able to multi-count University or college requirements towards their major and minor requirements. It is further understood that University Seminars and writing-intensive courses are designed to satisfy a Collegiate or University requirement or to be part of a major program of study and thus would be expected to count both towards the University writing requirement and another general requirement and are not discrete required courses.

**Cross Counting:** A major within the college is intended to provide the student with an in-depth knowledge of a given field. Departments are free to determine the design of the required curriculum for the majors they offer. The college requires only that each major consist of a minimum of 10 courses (30 credit hours) though these courses may multi-count for any University or College requirement, as described above.

Furthermore, if a student chooses to pursue an additional program of study leading towards a second major or a minor within the College, individual courses may cross-count among these programs provided that each major consists of a minimum of 10 discrete courses (or 30 discrete credit hours) and each minor of a minimum of 5 discrete courses (or 15 discrete credit hours). That is to say, with departmental approval(s), students may cross-count courses between a major and a minor, two majors, or two minors in order to satisfy area/field requirements within a major. A single course can therefore form part of multiple majors or minors if it is deemed to provide some skill or knowledge that is essential for each program. For example, a student majoring in two disciplines that require statistics would need (with departmental approval) to take only one such course for the two majors. However, it is required that students substitute another course within one of the majors for the cross-counted course, such that each major will always comprise at least 10 unique courses (or 30 credit hours) in accordance with major requirements. The same applies for minors: if a course is cross-counted between majors and/or minors, it is expected that each minor will nevertheless consist of a minimum of 5 unique courses (15 credit hours), with another appropriate course replacing the cross-counted course. In each case, however, courses may still multi-count between University or College requirements and major/minor requirements.

**SUMMARY OF COLLEGE REQUIREMENTS:**

Students in the College of Arts and Letters must fulfill the following specific requirements.

University requirements are described under “University Requirements,” in the front section of this Bulletin.

**Collegiate Requirements**

Arts and Letters students are required to take one of each of the following courses, three of which may be double-counted, as appropriate, towards the University Core Requirements designated as Liberal Arts 4, Liberal Arts 5, and Liberal Arts 6.

- Literature
- Fine Arts
- History
- Social Science

**Foreign Language Requirement**

The College recognizes that students come to Notre Dame with some foreign language competency, as this is usually a requirement for admissions. Accordingly, students who choose to continue the language they have previously studied will be able to place out of lower-level language courses but must take at least one language course at the appropriate level during their undergraduate career. The foreign language requirement may be satisfied through the study of any modern or classical language offered at the University up to and including four semesters (or similar exposure). This will normally be a minimum of 14 credit hours over four semesters.

Students cannot be exempted from this requirement by placing at a higher level: all students must take at least one semester of a foreign language at the appropriate level. Such a requirement recognizes the importance of foreign languages and cultures in our increasingly global society.

**Students who enter the University from a high school program where the language of instruction is other than English may be exempted from the foreign language requirement. Such students should petition the dean of the college (or the dean’s designee) and may be subject to an oral interview and/or a written exam in the relevant language before the exemption is granted.**

**Collegiate Seminar:** Students with significant oral communication disabilities may petition to be exempted from the College Seminar requirement.

**Writing Requirement.** Students in Arts and Letters are required to complete one course in their major at the 30xxx or 40xxx level designated as a writing-intensive course. This course may satisfy other distributional requirements within the major. Writing intensive courses require the student to work closely with a professor throughout the semester on a significant written project.

**Activity and Experiential Learning Courses.** Three elective credits of the required 122 hours can be derived/obtained from the following activity courses:

- Band (Marching and Concert)
- Orchestra
- Chorale
- Liturgical Choir
- Folk Choir
- Music Lessons and Ensembles
- Ballet
- Debate
- Social Concerns Seminars

Exceptions will be made for music majors for music lessons and ensembles. If students complete more than three of these courses, these will appear on a student’s transcript, but the extra credits will be subtracted from the student’s total number of hours at the time the graduation check is made; hence, these will not count toward the 122 hours needed to graduate.

**Pass-Fail.** With permission from the academic dean, juniors and seniors may take one non-major, non-required elective course on a pass-fail grading basis. These declarations must be made during the enrollment period of each semester, and once made, these declarations are irreversible. Note that some courses do not have the option to be taken Pass/Fail.

**Arts and Letters Degree Credit.** Students may not count both examination and degree credit for the same course toward graduation hours. For example, a student who has advanced placement credit for ROSP 20201 may not take ROSP 20201 and count both toward the 122 hours required in Arts and Letters. Students also may not count for degree credit both of two equivalent courses taught at Notre Dame. For example, PHIL 10101 and 20201 are considered to be equivalent courses, as are ECON 10015 and 20015. Students should take only one of each pair but not both. In cases where a student has double credit for the same course, the credits for only one course will be counted toward the student’s degree credit, despite the fact that credits for both will appear on the student’s transcript. A list of equivalent math and science courses can be found at the end of the College of Science section of the Bulletin. The same rules about double credit apply to them.

**ROTC.** Credits received for 10xxx- and 20xxx-level ROTC courses do not count toward a student’s 122 required credit hours, despite being recorded on the transcript. They will be manually subtracted from
the student's total number of hours in the graduation check and/or electronically in the Graduation Progress System (GPS) software. The College of Arts and Letters accepts a maximum of 12 free elective credits only for ROTC students from the 30xxx- and 40xxx-level military sciences only. Non-ROTC students may not take ROTC courses for credit toward graduation except by special permission obtained in advance of registering for the course from the deans in the Office for Undergraduate Studies. If a non-ROTC student registers in ROTC classes without first acquiring permission, these credits will appear on the student's transcript, but the credits will be subtracted manually from the student's total hours at the time the graduation check is made.

Combination Five-Year Program with the College of Engineering. In 1952, in cooperation with the College of Engineering of the University, the College of Arts and Letters instituted a five-year program that combines a liberal arts program with the requirements of the various engineering programs. Students who complete the combination program will earn two degrees: the degree of bachelor of arts and the degree of bachelor of science in the engineering major pursued. Dual degree students are eligible to join the Reilly Program in Engineering and Arts and Letters described at http://reilly.nd.edu/reilly-dual-degree-in-arts-and-letters-and-engineering/.

Study Abroad. In light of the expansion of Notre Dame's education abroad opportunities, students are encouraged to participate in University programs whenever possible. For students whose academic or programmatic needs cannot be met through existing Notre Dame programs, limited exceptions to allow a student to attend non-Notre Dame programs abroad will be made on an individual basis after extensive consultation among the students, their faculty advisors, and the deans.

Student Awards and Prizes

COLLEGIATE AWARD IN MODERN AND CLASSICAL LANGUAGES
The Robert D. Nuner Modern and Classical Language Award—presented to the graduating senior in the College of Arts and Letters with a first or second major in any classical or modern foreign language, who has earned the highest cumulative grade point average.

AFRICANA STUDIES
The Wright, Flint-Hamilton & Mason Directors Award—recognizing excellence in research on a topic exploring social, political, economic and/or cultural aspects of the African and African American Diaspora.

AMERICAN STUDIES
The J. Sinnott Meyer Award for Outstanding Service to the Community—J. Sinnott Meyer was to have graduated from Notre Dame in the spring of 1920. Instead, he died in February of that year. Mr. and Mrs. A.R. Meyer of Paducah, Kentucky, established the J. Sinnott Meyer “Burse” in memory of their beloved son. The Meyer Award is given for outstanding service to the community here at Notre Dame and beyond (i.e., local, state, and national levels of service). This award is available to an American Studies senior major.

The James E. and Barbara Murphy Award for Exceptional Journalism—A 1947 graduate of Notre Dame, James E. Murphy entered the world of journalism while doing graduate work at the Medill School of Journalism, Northwestern University. He then joined ABC News Radio Network as a writer/editor. Murphy migrated to the field of public relations, returning to his alma mater as director of public information. From that day until his last assignment overseeing Notre Dame's 150th birthday commemoration, Murphy’s influence was felt over the entire panoply of activities advancing the image of the University. After serving as the guiding hand of public relations for more than four decades, he retired as associate vice president for university relations. The Murphy award is given for exceptionally submitted journalism. This award is available to any American Studies major or journalism minor.

The Paul Neville Award for Excellence in Journalism—After graduating from Notre Dame in 1942, Paul Neville joined the South Bend Tribune as chief political reporter, then served as sports and managing editor. In 1957 he left to become managing editor of the Buffalo Evening News. Eventually, he was named executive editor of that paper. The Neville Award is for excellence in journalism. This award is available to an American Studies major or journalism minor.

The Walter Beardsley Award—awarded for excellence in the MFA/BFA show.

The Radwan and Allan Riley Prize in Studio Art—awarded to a senior studio art major for excellence in his or her respective field.

The Radwan and Allan Riley Prize in Studio Art—awarded to a senior studio art major for excellence in his or her respective field.

The Radwan and Allan Riley Prize in Studio History and Criticism—awarded for the best essay in art history or criticism submitted by an undergraduate or graduate student.

Grief Art Awards—awarded to outstanding senior BFA students to defray the cost of their thesis exhibitions.

Emil Jacques Medals for Work in the Fine Arts—a gold and a silver medal are awarded for excellence in studio art to undergraduates pursuing a BFA.

The Peter Brown Professional Achievement Award—awarded to the anthropology student with outstanding performance in the tasks of a professional academic in one or more of the following areas: publication, presentation at professional meetings, grants, and fellowships.

The David Huffman Scholar/Athlete Award in Anthropology—awarded to the student with outstanding performance in the major and in athletics.

The Irish Press Prize in Medical Anthropology—awarded for the best paper in medical anthropology.

The Father Murray Integrative Award in Anthropology Paper Award—awarded to the best student paper that crosses traditional boundaries and draws from a range of different areas of scholarship to develop a fuller understanding of being and becoming human.

The Julian Simon Award—awarded to the student demonstrating broad engagement with academic life.

ART, ART HISTORY, AND DESIGN

The James E. and Barbara Murphy Award for Excellence in Journalism—awarded for excellence in the MFA/BFA show.

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ANTHROPOLOGY

The Mabel L. Mountain Memorial Art Award—awarded for excellence in studio art to undergraduates pursuing a BFA.

The Peter Brown Professional Achievement Award—awarded to the anthropology student with outstanding performance in the tasks of a professional academic in one or more of the following areas: publication, presentation at professional meetings, grants, and fellowships.

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To Table of Contents


### ARTS AND LETTERS PRE-HEALTH

The Dr. Robert Joseph Barnet Award—presented to an outstanding Arts and Letters pre-health senior who has demonstrated, in addition to excellent character, superior academic achievement across the arts and sciences.

The Dr. John E. Burke Award—presented to an outstanding Arts and Letters pre-health senior who has demonstrated, in addition to excellent academic achievement, outstanding leadership qualities through service within and/or beyond the Notre Dame community.

### ASIAN STUDIES

The Liu Family Distinguished Achievement Award in Asian Studies—awarded to a senior for excellence in Asian Studies.

### CLASSICS

Departmental Award in Greek, Latin, or Arabic—awarded when merited to a graduating senior for excellence in the study of Greek, Latin or Arabic.

The Helen Hritzou and Jewell Erickson Award—for excellence in Classics/Arabic Studies.

### EAST ASIAN LANGUAGES & CULTURES

Liu Institute for Asian and Asian Studies Undergraduate Essay Award—awarded to the student with the best undergraduate essay in Asian Studies.

The Liu Family Distinguished Achievement Award in Asian Studies—awarded to the student with considerable achievement in Asian Languages and Asian Studies.

Distinction in Chinese Award—awarded to a senior for excellence in the study of Chinese.

Distinction in Japanese Award—awarded to a senior for excellence in the study of Japanese.

Distinction in Korean Award—awarded to a senior for excellence in the study of Korean.

### ECONOMICS

The John Joyce Award on the American Worker—given as merited to the best undergraduate short story or poem on the "American Worker," by the Higgins Labor Studies Program and the Economics Department. (There is also a graduate award for the best graduate essay).

John Harold Sheehan Prize Essay Award—given to the senior economics major who has written the best senior honors essay in economics.

The Weber Award—awarded to the senior economics major who has achieved the highest academic average.

### ENGLISH

The Billy Maich Academy of American Poets Award—awarded to the undergraduate or graduate student submitting the best collection of original poetry.

Eleanor Meekhan Medal for Literary Merit—awarded to the English major who submits the best critical essay written for an English course.

The James E. Robinson Award—awarded to the outstanding senior English major.

The Ernest Sandeen Poetry Award—awarded to the undergraduate submitting the best original poetry.

The Richard T. Sullivan Award for Fiction Writing—awarded to the undergraduate who submits the best original fiction manuscript.

### FILM, TELEVISION, AND THEATRE

The Reginald Bain Award—awarded to a Notre Dame student who produced remarkable theatre projects from any area of theatre during the academic year.

Catherine Hicks Award—awarded to an outstanding graduating senior in theatre.

Joseph P. O'Toole Jr. Award—awarded to the outstanding graduating senior in film studies.

The Award in Television Studies—awarded to a graduating senior for outstanding work in television studies.

### GENDER STUDIES

The Boehnen Fund for Excellence in Gender Studies Summer Internship Grant—awarded to gender studies students to support summer internships.

The Genevieve D. Willis Endowment for Excellence Research Grant—awarded to gender studies students to support senior thesis research.

The Genevieve D. Willis Senior Thesis Prize—awarded for the best thesis written by an undergraduate at Notre Dame on a topic related to gender studies.

The Philip L. Quinn Essay Prize—Awarded for the best essay written by an undergraduate at Notre Dame on a topic related to gender studies.

### GERMAN AND RUSSIAN LANGUAGES AND LITERATURES

The Rev. Lawrence G. Broeckl, C.S.C., Award—presented to the graduating senior with the best academic achievement in German.

Delta Phi Alpha German Honor Society Award—awarded to a graduating senior for outstanding achievement in the study of German language and literature.

Jeffrey Engelmeier Award—presented to an outstanding student of German whose leadership and contribution to the life of the department are especially conspicuous.

The Russian Senior Award—presented to the graduating senior with the best academic achievement in Russian.

The Lauren B. Thomas Scholarship—awarded by the Russian faculty to an outstanding Russian major who exhibits financial need.

### HISTORY

The Monsignor Francis A. O’Brien Prize—presented to the senior who has achieved distinction with the best essay in history.

The O’Connell Award—an annual award for the best sophomore or junior essay in history.

The O’Hagan Award—awarded to the undergraduate who has submitted the best original essay on a phase of Irish history.

The Senior Honors Thesis Award—awarded for the best history thesis by a senior history major.

### IRISH LANGUAGES AND LITERATURE

The Brother Simeon Prize for Distinction in Irish—for excellence in Irish language and literature.

### IRISH STUDIES

The Donald and Marilyn Keough Award—for excellence in Irish Studies.

### JOHN J. REILLY CENTER

John Jay Reilly Scholar in Arts and Letters and Engineering Dual Degree Award—for exhibiting high standards of excellence and outstanding academic achievement.

### MEDIEVAL STUDIES

Robert M. Conway Prize in Medieval Studies—given to a graduating senior who has written the best essay on a medieval subject.

### MUSIC

Department of Music Senior Award—awarded to an outstanding senior in the Music Department.

### PHILOSOPHY

The.Dockweiler Medal for Philosophy—presented to the senior submitting the best essay on a philosophical subject.

The John A. Oosterle Award in Philosophy—awards given when merited to graduating philosophy majors for excellence in philosophy.
POLITICAL SCIENCE

The Gary F. Barnabo Political Science Writing Award—awarded for the best paper contributing to nonviolent solutions to world conflicts.

Paul Bartholomew Essay Prize—awarded to the senior major submitting the best senior honors essay in the fields of American politics or political theory.


The Stephen Kertzez Prize—awarded to a senior major submitting the best senior honors essay in the field of international relations or comparative politics.

The Rooney Center for the Study of American Democracy Award—awarded to the student who submits the best senior honors thesis in the field of American politics.

PROGRAM OF LIBERAL STUDIES

The Otto A. Bird Award—awarded to the Program of Liberal Studies student who submits the best senior essay.

The Susan Marie Clements Award—awarded to a woman among the Program of Liberal Studies graduating seniors who exemplifies outstanding qualities of scholarly achievement, industry, compassion, and service.

The Edward J. Cronin Award—awarded annually to a student who submits the best essay in a Program of Liberal Studies course.

The Willis D. Nutting Award—given to the senior major who best embodies the department's high teaching and learning ideals.

The Stephen Rogers Award—presented to an outstanding Program of Liberal Studies senior pursuing graduate study.

PSYCHOLOGY

The John F. Santos Award for Distinctive Achievement in Psychology—to a senior psychology major in recognition of outstanding achievement in research, academic performance, and student-life activities.

Senior Recognition Award in Psychology—given in recognition of outstanding achievement in research, academic performance, and student-life activities, while pursuing a major course of study in psychology.

ROMANCE LANGUAGES AND LITERATURES

Robert D. Nuner Award—presented to the graduating senior in the College of Arts and Letters with a first or second major in any classical or modern foreign language who has earned the highest cumulative grade point average.

Endowment for Excellence Award in Romance Languages and Literatures—presented to a graduating senior for excellence in Romance languages and literatures.

Walter Langford Awards for Excellence in Spanish Literature and Excellence in French Literature—two awards—to the graduating senior majors in French and Spanish literature whose work was deemed most outstanding by the Romance languages and literatures faculty.

The Joseph Iulo Basco Senior Award—awarded to a graduating senior for excellence in Italian Studies.

SOCIOLGY

The Margaret Eisch Memorial Prize in Sociology—awarded to an outstanding graduating senior majoring in sociology.

The Sociology Major Essay Award—presented to the senior sociology major who has written the best essay.

THEOLOGY

The Gertrude Austin Marti Award in Theology—presented to a graduating senior who has evidenced qualities of personal character and academic achievement in theological studies.

The Rev. Joseph H. Cavanagh, C.S.C., Award—awarded to the senior who has evidenced high qualities of personal character and academic achievement, particularly in theological studies.

Service Awards

AMERICAN STUDIES

J. Sinnot Meyers Award—awarded to a senior in American Studies for outstanding service to the academic community.

ECONOMICS

Lawrence J. Lewis Award—awarded to the senior in the Department of Economics who has best distinguished himself or herself in community service.

MUSIC

Band Vice President Prize—annual award to the elected vice president of the band.

Terry Baum Secretary Prize—awarded to the secretary of the band and presented by the University of Notre Dame.

Hulland President's Prize—annual award for the outgoing president of the band.

Thomas J. Kirschner Band Treasurer Prize—annual award to the elected band treasurer.

The Kohak Memorial Scholarship—for outstanding instrument achievement for band.

Robert F. O'Brien Award—for outstanding service and dedication to the band.

Outstanding Band Member Award—for loyalty, dedication, and leadership.

Outstanding Marching Band Award—awarded for dedication, ability, and leadership during marching band season.

The Daniel H. Peake Memorial Award—presented to two underclassmen in the Notre Dame Glee Club in recognition of musical leadership, exemplary personal character and overall contribution to the success of the group.

Gerald J. Smith Memorial Award—awarded for citizenship and loyalty to band.

Social Chairperson Award—plaque given annually to the social chairperson in appreciation for dedication and service to the Notre Dame bands.

PEACE STUDIES

The Peter Yarrow Award in Peace Studies—awarded to an outstanding student in Peace Studies with a commitment to justice and service work.

POLITICAL SCIENCE

George Brinkley Service Award—at the student who best exemplifies the Political Science Department's ideal of public service through service to the department, the University, or the wider community.

ROMANCE LANGUAGES AND LITERATURES

Carlos Aballi Award in Hispanic Cultural Awareness—given to a graduating Hispanic student who has taken Spanish at Notre Dame and has been active in promoting Hispanic cultural awareness at Notre Dame.

The Mara Fox Award for Service to Hispanic Youth—awarded to a graduating Hispanic student who has taken Spanish at Notre Dame and contributed outstanding service to Hispanic youth. 
Special Arts and Letters Requirements

Language Requirement. Students without Advanced Placement or SAT II credit, but who come with some background in the language they elect will be placed by examinations given during first-year orientation and prior to spring preregistration. Departmental placement exams will not be credit-bearing. Students may receive up to 8 hours of credit based on their scores on the AP and SAT II tests. If, for some reason, more than 8 hours of credit appear on the transcript, the credits beyond 8 will be non-counted and will be manually subtracted from the total number of degree credits counting for graduation. Regardless of the scores on these exams, it is impossible for a student to test out of the language requirement in the College of Arts and Letters. Every student in arts and letters must take at least one course at the appropriate level that deals with texts in the original language. For the specific details of a given language offering or program, check with the relevant department.

College Seminar. The College Seminar is a unique one-semester course shared by all students earning a degree in the College of Arts and Letters. Typically taken in the sophomore year, the course offers students an introduction to the diversity and distinctive focus of arts and letters at the University of Notre Dame. Specific sections of the College Seminars vary in their topics and texts, but all feature an interdisciplinary approach, commitment to engaging important questions, employment of major works, and emphasis on the development of oral skills. Every College Seminar syllabus will include works that approach the topic from the perspective of each of the three divisions of the college: the arts, humanities, and social sciences.

College Seminar fulfills the CSEM requirement and cannot fulfill any other requirement.

Arts and Letters Programs

The programs offered by the College of Arts and Letters include majors, supplementary majors, and minors, which may be either departmental or interdisciplinary. Every student in the college must complete one major sequence. Supplementary majors and minors are optional and may be taken to supplement or enhance a student’s major but do not lead to graduation in and of themselves.

Majors

A major sequence is a carefully chosen combination of courses from an individual department or program that stands alone in qualifying students for an undergraduate degree. It usually consists of between 8 and 12 courses. In contrast to the University and college requirements that provide students with broad exposure to a variety of the liberal arts and sciences, the major affords the student an opportunity to gain more specialized knowledge of a particular field or discipline.

The major in liberal arts programs is normally declared during the sophomore year and is completed during the junior and senior years. Arts and Letters students must declare at least one major no later than the sixth class day of first semester of senior year. Each semester before preregistration, the college holds a series of programs and meetings to inform the students about the various majors so that they may make informed choices. Students pursue their majors under the direction of the departmental or program chair and its advising staff.

Supplementary majors are those that cannot stand alone in qualifying a student for an undergraduate degree but must be taken in conjunction with a primary major. They include both interdisciplinary and departmental offerings.

Minors

Minors are typically five-course sequences, and the college offers two categories of minors: Departmental and Interdisciplinary.

Departmental:
- Africana Studies
- Anthropology
- Art History
- Art Studio
- Business Economics
- Chinese
- Classics
- Mediterranean/Middle Eastern Studies
- Collaborative Innovation
- French and Francophone Studies
- Gender Studies
- German
- Greek
- History
- Irish Language and Literature
- Italian
- Japanese
- Korean
- Latin
- Philosophy
- Portuguese and Brazilian Studies
- Russian
- Russian Studies
- Sociology
- Data Science
- Theology

For details, see the departmental descriptions in the section “Programs of Study.”

Interdisciplinary:
- Catholic Social Tradition
- Computing & Digital Technology
- Constitutional Studies
- Education, Schooling, and Society
- Hesburgh Program in Public Service
- Journalism, Ethics, and Democracy
- Latino Studies
- Linguistics
- Liturgical Music Ministry
- Medieval Studies
- Musical Theatre
- Philosophy, Politics, and Economics
- Philosophy, Religion, and Literature
- Philosophy, Science, and Mathematics
- Poverty Studies
- Science, Technology, and Values
- Teaching English to Speakers of Other Languages

Electives

In addition to the university and college requirements and the major requirements, the balance of a student’s usual five-course-per-semester program consists of elective courses, which can be drawn from the offerings of any department or college that are open to non-majors who have met the necessary prerequisites.
Africana Studies

Chair:
Dianne Pinderhughes, Professor, Political Science and Africana Studies

Joint Faculty:
Paulinus Odozor, Associate Professor, Theology and Africana Studies
(The Rev.) Hugh R. Page Jr., Vice President and Associate Provost for Undergraduate Studies; Professor, Theology and Africana Studies
Richard B. Pierce, John Cardinal O’Hara, C.S.C., Associate Professor, History and Africana Studies

Emeritus Faculty:
Rahul Oka, Ford Family Assistant Professor, Africana Studies
Paul Ocobock, Assistant Professor, History
Chanté Mouton Kinyon, Professor, Irish Studies
Leslie L. Morgan, Associate Faculty Librarian
Marisel Moreno, Associate Professor, Spanish
Rory M. McVeigh, Professor, Sociology
Paul V. Kollman C.S.C., Associate Professor, Theology; Fellow, Joan B. Kroc Institute for International Peace Studies

Concerns

Theology; Fellow, Kroc Institute for International Peace Studies
Emmanuel Katongole, Associate Professor, World English
Cyrainna Johnson-Roullier, Associate Professor, Political Science
Karen Richman, Director, Undergraduate Studies

Chair:
Jacquetta Page, Adjunct Assistant Professor, Africana Studies
Karen Richman, Director, Undergraduate Studies
Institute for Latino Studies and Creole Language and Culture Program
Jason Ruiz, Director of Undergraduate Studies & Associate Professor, American Studies
Valerie Sayers, Professor, English
Sophie White, Professor, American Studies
Todd David Whitmore, Associate Professor, Theology; Fellow, Joan B. Kroc Institute for International Peace Studies

Office Coordinator:
Gayle Carter, Africana Studies, 631-0397

Please contact the Director of Undergraduate Studies, Maria McKenna at mmckenna@nd.edu for major/minor enrollment.

The Department of Africana Studies at the University of Notre Dame is dedicated to the holistic and integrative study of Africans and people of African descent in the Americas and the global diaspora. Building on the legacy of the former African and African American Studies Program (1967–2005), the department emphasizes a cross-regional, cross-cultural perspective, a comparative analysis of and between different diasporan groups and the national and global contexts they inhabit. This multidisciplinary department seeks to explore the history, society, politics, economic development, philosophical, theological and theoretical perspectives, literature, arts, religions, and cultures of the peoples of Africa and the African diaspora. Its comparative and relational foci highlight the connections between culture, race, gender, class, nationality, and other categories of identity and experience.

The Department of Africana Studies aspires to become a center for academic and community activity, an innovative centerpiece for the University of Notre Dame. Undergraduates draw on a range of academic and community activities designed to stimulate intellectual inquiry, excellence in scholarship, and creative engagement.

Program of Studies. The major, supplementary major, and minor in Africana Studies offer: (1) a disciplined and rigorous intellectual environment to study the histories, literatures, languages, and cultures of African and Afrodiasporan peoples; and (2) an intellectual appreciation of the richness, diversity, and complexity of the African American experience—particularly when it is viewed within national and global contexts.

The department also has opportunities for dialogue, reflection, and social engagement within and beyond the classroom. Upon completion of all requirements, students will have received both a solid introduction to the discipline of Africana Studies and an appreciation of how it interfaces with other areas in the humanities, arts, social sciences, and theological disciplines.

Africana Studies degree options for Notre Dame undergraduates consist of a major (30 credit hours), including a “capstone” experience consisting of a senior project or thesis, an interdisciplinary minor (15 credit hours), and a supplementary major (24 credit hours).

Beginning in the fall of 2018, the Department of Africana Studies will accept one University Seminar taught in Africana Studies (AFST 13181/13184) as an elective course for our majors and minors. Additionally, the Department will accept the AP Research Seminar: African Diaspora course with a score of five for one elective course for our majors and minors. Students may multi-count an unlimited number of major and minor requirements with college and university requirements where applicable attributes apply.

Major (30 credit hours)
Introduction to Africana Studies (3 credit hours)
Interdisciplinary Requirement (9 credit hours)
Students will choose one AFST course from each of the following disciplines: literature/fine arts, history, and social science.

Senior Project or Senior Thesis (6 credit hours)
Four elective AFST courses (12 credit hours)

Supplementary Major (24 credit hours)
Introduction to Africana Studies (3 credit hours)
Interdisciplinary Requirement (9 credit hours)
Students will choose one AFST course from each of the following disciplines: literature/fine arts, history, and social science.

Four elective AFST courses (12 credit hours)

Minor (15 credit hours)
Introduction to Africana Studies (3 credit hours)
Interdisciplinary Requirement (9 credit hours)
Students will choose one course from each of the following disciplines: literature/fine arts, history, and social science.

One elective AFST course (3 credit hours)

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Africana Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

To Table of Contents
American Studies

Chair: Jason Ruiz
Director of Undergraduate Studies: Pete Cajka
W. Harold and Martha Welch Professor America Studies: Thomas Tweed
Professor Emeritus: Benedict Giamo; Thomas J. Schlereth; Robert Schmuhl; Ronald Weber
Associate Professors: Annie Gilbert Coleman; Perin Gurel; Jason Ruiz
Assistant Professors: Laurel Daen; Korey Garibaldi; Jennifer Huynh
Assistant Teaching Professors: Richard Jones
Assistant Teaching Professor: Pete Cajka; Robert Walls; Katherine Walden
Adjunct Assistant Professor: Victoria St. Martin
Adjunct Associate Professor: Jack Cobwell
Concurrent Faculty: Gail Bederman (History); Jon Coleman (History); Brian Collier (ACE); James Collins (Film, Television and Theatre); Patrick Griffin (History); Sandra Gustafson (English); Darlene Hampton (AL); Cyrina Johnson-Rouiller (English); Michael Kackman (FTT); Mary Celeste Kearney (FTT); Kate Marshall (English); Timothy Matovina (Theology); Terry McDonnell (Sociology); John McGreavy (History); Rebecca McKenna (History); Susan Ohmer (Film, Television, and Theatre); Richard Pierce (History); Dianne Pinderhughes (History); Valerie Sayers (English); Kerry Temple (Notre Dame Magazine); Laura Dasso Walls (English); Pamela Wójcik (Film, Television and Theatre).

The Discipline. Since its inception in the late 1930s, the discipline of American Studies has aimed to foster new understandings of America and its multiple peoples and cultures in a rapidly changing world. Its focus on the historical and intellectual underpinnings of the cultures, societies, religions, and politics of colonial America and the United States has continually returned to one central question: What does it mean to be an American? As the answers to this question have changed in response to demographic, economic, and political transformations, the discipline of American Studies has continually re-examined its methods and central questions. Shifting from an earlier emphasis on American uniqueness, or exceptionalism, American Studies has been for the past several decades the academic discipline most creatively and rigorously engaged in analyzing the complex and multi-layered expressions of American pluralism and diversity.

Program of Studies. American Studies offers interdisciplinary perspectives on American cultures and societies, American identities, and American political cultures and institutions. The curriculum introduces students to the major ideas and methods of the discipline, honing critical understandings of these methods in advanced courses, and ends with senior level seminars aimed at the highest level of research. To add stature and credibility to the major, a 6-credit Senior Thesis is offered, allowing exceptional students the opportunity to sharpen their critical abilities and improve their research techniques by developing a year-long project.

Students are introduced to the themes and issues dominant in American Studies (AMST) in Introduction to American Studies, taken at the freshman or sophomore level and intended as a gateway to the major. This required course, which explores key concepts, texts, and methods in American Studies and familiarizes students with the discipline’s working vocabulary and practices, is offered in the fall semester, and should be taken before students take AMST courses at the 30000 level. It may be taken concurrently with a 30000-level course in AMST, pending approval of a faculty advisor in American Studies.

The introductory course is followed by eight different upper-level courses in AMST, each of which continues to explore concepts, texts, and methods particular to the discipline of American Studies.

Of the eight upper-level courses, up to two “outside” courses may be taken from different departments, either on campus or through an off-campus Notre Dame program, as long as they are cross-listed with American Studies or otherwise approved by the Director of Undergraduate Studies.

Finally, AMST majors complete their coursework with the Senior Seminar in American Studies, a required 40000-level course which serves as a capstone to the major. Requirements include seminar-style discussions and a significant research project.

American Studies Major Requirements: Students must complete the general requirements of the College of Arts and Letters and 30 credit hours in American Studies, including the introduction to American Studies, 8 upper-level courses, and a senior seminar.

Internships. Students are encouraged to pursue internships over the summer and during the semester that enhance and apply their coursework in American Studies. If the internship is not paid and relates to American Studies, students may earn elective credit for that experience, upon approval from the Director of Undergraduate Studies. For further details, please review the description for the course AMST 25001 “Internship in American Studies.”

Study Abroad. Upon approval of the Director of Undergraduate Studies, students may take up to 6 credit hours of course work abroad towards the major.

American Studies Senior Thesis. A senior thesis is a year-long research project developed with a faculty advisor that attempts to make a contribution to the field of American Studies. The final project may take on a variety of forms, including a scholarly paper, narrative nonfiction essay, journalistic article or series of articles, documentary film, or museum exhibition. The opportunity to write a Senior Thesis in American Studies is open to any major with a GPA of 3.5 or higher within the major as of January of their junior year. In exceptional circumstances students with a GPA below 3.5 may apply. Writing a thesis is a chance to do original research and explore a topic of your choice, to develop a deeper relationship with a faculty member, and to put what you’ve learned as an American Studies major into practice. It is also a significant commitment. Students need one if they want to earn departmental honors in American Studies, but they do not need one to satisfy the requirements for the major. Students writing a senior thesis must register for 6 credit hours in addition to the 30 required for the major, distributed as noted below. Note: Students writing a senior thesis may substitute the senior seminar requirement with one additional 30000-level course.

Students choosing to write a senior thesis will submit a formal application to the department by April 1 of their junior year, which requires: 1) An idea for the project, including central research questions, sources and research that will answer those questions, the student’s method or approach, and the shape of the final product; 2) A primary advisor who has agreed to help with the project. The primary advisor must be a full-time tenured or tenure-track faculty member in AMST and will be the instructor of record for the thesis project; 3) Information on grants applied for and won. Application forms and additional information are available through the departmental website.

Once accepted, students should confirm their plans with their primary advisor and be sure to register in the fall for the Senior Thesis AMST 43909 (3 credit hours). This course is limited to thesis writers, will meet during a regular class time, and is required. It is designed to help students develop their thesis projects, conduct research, and think about how their work relates to the field of American Studies. Students will work closely with the instructor and their primary advisor, and less formally with a secondary reader of their choice. Students writing a thesis and thus enrolled in The Senior Thesis AMST 43909 have the option to take, as their tenth class required for the major, either a senior seminar or an additional “inside” 30000-level class.

In the spring students will register for Senior Thesis Writing AMST 47910 (3 credit hours). This course is independent work with the primary advisor; students will complete their research and writing, as well as plan and give presentations of their work. The final senior thesis project is due in early April.

To Table of Contents
Anthropology

Chair:
Mark R. Schurr
Edmund P. Joyce Professors of Anthropology:
Roberto A. DaMatte (emeritus); James J. McKenna (emeritus)

Professors:
Susan Blum; Ian Kuijt; Carolyn Nordstrom (emerita); Irwin Press (emeritus); Mark R. Schurr

Associate Professors:
Maurizio Albahari; Christopher Ball; James O. Bellis (emeritus); Catherine Bolten; Meredith S. Chesson; Rev. Patrick D. Gaffney, C.S.C. (emeritus); Lee T. Gettler; Donna Glowacki; Joanne M. Mack (emerita); Kenneth E. Moore (emeritus); Susan G. Sheridan; Vania Smith-Oka

Associate Professor of the Practice:
Eric Haanstad

Assistant Professors:
Alex E. Chávez; Mark Golitko; Cara Ocobock

Director of Graduate Studies
Vania Smith-Oka

Director of Undergraduate Studies
Eric Haanstad

Affiliated Faculty
Ann-Marie Conrado, Assistant Professor, Art; Art History and Design; Diarmuid Ó Giolláin, Professor, Department of Irish Language and Literature; David Hernandez, Assistant Professor, Department of Classics; Carlos Jáuregui, Associate Professor, Romance Languages; Peter Jeffery, Professor, Department of Music; Julia Kowalski, Assistant Professor, Keough School of Global Affairs; Rahul Oka, Associate Research Professor, Anthropology and Keough School of Global Affairs; Matthew Ravosa, Professor, Department of Biological Sciences; Karen Richman, Director, Associate, Professional Specialist, Border and Interamerican Affairs; Deborah Rotman, Associate Professional Specialist; John Sherry, Professor, Department of Marketing; Lawrence Sullivan, Professor, Department of Theology; Robert Walls, Assistant Professor, Department of American Studies; Todd Whitmore, Associate Professor, Department of Theology

Program of Studies
The undergraduate program in anthropology is designed to provide each student with a broad, holistic, integrated and species-wide perspective on contemporary human behavior. Anthropology may be the only major that provides significant intellectual and professional links with the humanities and other social science fields, while also providing separate bridges into both the natural sciences and the field of business. In so doing the anthropology major prepares students for successful entry into any number of fields and disciplines and their appropriate professional graduate schools, including medical schools, public health, and law, design, and business. Human evolutionary models, critical comparative analyses, ethnographic methods, and a variety of developmental approaches are taught and applied in our classes to such diverse topics and research areas as: health; illness; addiction; human communication (verbal and non-verbal); human origins; the nature of social groups; the family; worldwide political and socio-economic systems; religion; warfare; infancy and childhood; non-human primate ecology and behavior; archaeology, prehistory, and ethology; sexuality; museum studies; evolutionary medicine; transnationalism; sex and gender; food; and medical anthropology. Geographic specialties of the faculty include China, Southeast Asia, North America, Latin America, Russia, Italy, Ireland, Egypt, Central and Southern Africa, and the Middle East.

As one of the premier undergraduate research and teaching departments in the nation, our faculty stress the importance of innovative and significant undergraduate research. We aim to provide hands-on research experience in both the field and laboratory. Paid Smithsonian and Chicago Field Museum summer research internships created by the department are available to majors and minors. It is common throughout the school year and summer that the faculty pair up with students to conceptualize and work together on research projects both here and abroad. Often this collaborative research leads to joint publications. Our undergraduate students receive many undergraduate research awards from the University and regularly attend national professional meetings to stand alongside graduate students and professors from around the nation to present the results of their research. Our anthropology minors also participate to a high degree.

Aside from its applicability and relevance across different disciplines, professions, and careers, one of the truly unique aspects of anthropology is that it profoundly changes how our students experience and interpret their own lives. The subject of anthropology is humankind as viewed not through a local lens limited by the biases or world view of one's own culture, but by a view that attempts to reconcile and understand the intersecting and sometimes conflicting, yet, often logical alternative ways by which our fellow human beings live and think.

Through these personal encounters, experienced alongside exposure to the very best scholarship, our anthropology students connect easily and successfully with diverse professional communities. This fluidity by which our graduates make the transition into so many varied fields, the knowledge and skills gained by studying anthropology, in addition to providing keen insights into others, enriches one's understanding of one's self. In this way anthropology maximizes the chances of personal achievement and self-fulfillment, and offers a powerful holistic core of experience for excellent cutting-edge jobs in any career path.

Writing-Intensive Requirements: All courses taught in the department include writing components, which are both informal and formal and vary by course level. These assignments may include...
response papers, journals, in-class writing, analyses, field research, or research papers. Courses offered in anthropology develop both critical thinking skills and global awareness through written and other assignments. Every major is required to take an advanced theory seminar (ANTH 40400, Perspectives in Anthropological Analysis) where they develop analytical and synthetic skills through intensive writing assignments combined with class discussion. All of the optional Senior Thesis sections (ANTH 48900) are also writing intensive.

PROGRAMS

1. The Major. There are no prerequisites to the major. The major requires 30 credits, six of which must be in the sequence of fundamentals, including ANTH 20201 (Fundamentals of Biological Anthropology), ANTH 20202 (Fundamentals of Archaeology), ANTH 20203 (Fundamentals of Social and Cultural Anthropology), and ANTH 20204 (Fundamentals of Linguistic Anthropology). In addition, majors must take ANTH 40400 (Perspectives in Anthropological Analysis), one methods course (3 credits), and 18 credits of electives. At least six credits of the electives must be at the 40000 level. It is recommended that students take the fundamentals by the end of their sophomore year, whereas ANTH 40400 is usually taken as a junior or senior.

2. The Honors Track. The honors track requires 36 credits and a minimum anthropology GPA of 3.5, or faculty recommendation from the department. In addition to the above program, the honors student will take one additional methods course (3 credits) and ANTH 48900 Anthropology Senior Thesis (3 credits) or equivalent.

3. The Minor. The minor requires 15 credit hours. There are no prerequisites. Students must take two of the four fundamentals, ANTH 20201, 20202, 20203, and 20204. In addition, students must take nine credits of electives. Courses taken for pass-fail credit will not satisfy requirements for the major, the honors track, or the minor.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Anthropology. Course descriptions can be found by clicking on the subject code and course number in the search results.

Courses in which graduate students may enroll and for which graduate credit may be obtained are at the 40000 level and higher. Special requirements are made of graduate students who enroll in these courses.

Art, Art History, and Design

Chair:
Richard Gray

Professors:
Rev. Austin Collins, C.S.C.; Heather Minor; William Kremer; Martina Lopez; Scott Shim; Maria Tomasula

Associate Professors:
Clinton Carlson; Ann-Marie Conrado; Richard Gray; Jason Lahr; Rev. Martin Lam Nguyen, C.S.C.; Robin Rhodes; Michael Schreffler; Neeta Verma

Assistant Professors:
Marius Hauknes; Tatiana Reinoza; James Rudolph; Nicole Woods

Associate Professors of the Practice:
Emily Beck; Tim Morton; Elyse Speaks

Assistant Teaching Professor:
Justin Barfield

Website: http://artdept.nd.edu/

The Department. The Department of Art, Art History, and Design at the University of Notre Dame, is a multidisciplinary department offering programs of study in studio art, art history, and design. The mission of the department is to provide students with intellectually informed, hands-on instruction in creative studies within the context of a liberal arts university. An active lecture and visiting artist series and the extensive collections of the Snite Museum of Art strengthen and broaden the work in the classroom and studio. The South Bend and Chicago areas provide additional cultural activities and experiences.

The department has fifteen studio art and design faculty, and seven art history faculty. Undergraduate students may pursue coursework leading to one of two degrees: the bachelor of arts (BA) in studio art, art history or design; or the bachelor of fine arts (BFA) in studio art or design. A minor in studio art is also offered to those students who wish to add experience in visual art to their undergraduate studies.

The departmental office is located in Riley Hall along with all studio art facilities, classrooms, and studio faculty offices. The art history classrooms are on the first floor of O’Shaughnessy Hall and the art history faculty offices are in Decio Faculty Hall. The design classrooms, studios, and design faculty offices are located in West Lake Hall. Skilled teaching scholars and support facilities are available as appropriate for each medium that is offered. The Center for Creative Computing operates five specialized computing labs for studio and design work including a professional digital printing studio in Riley Hall.

Students with a degree in creative studies are uniquely competitive among job-seeking graduates today. It is well recognized that creative study fosters methods of scholarship and production that employers and research institutions alike find compelling. A creative person draws on innovative approaches to solve problems; is willing to take initiatives in the face of ambiguity and uncertainty; is able to accept critical feedback to revise or expand an idea; can successfully communicate the value of their approach to others; and has the ability to mobilize resources to realize their ideas in an original form. In short, creative study is essential to the educational preparation needed to compete in the complex world culture we work and live in today.

THE STUDIO ART AND DESIGN MAJOR AND MINOR IN STUDIO ART

Bachelor of Arts Degree in Studio Art and Design

The Bachelor of Arts degree program in art and design is defined as a general liberal arts degree. The BA degree is ideal for the student who desires a liberal education with a strong emphasis in art. Students enrolling in the BA degree program are required to complete a five-course core curriculum. These courses are Drawing I, 2D Foundations, 3D Foundations, and two art history courses. Students are encouraged to select an area of concentration for the BA degree (studio art, visual communication design, or industrial design), or may opt to pursue a general course of study. The BA degree consists of 36 hours in art and design, of which 27–30 are in studio and 6–9 in art history.

Bachelor of Arts with Honors

The BA with Honors is comprised of two additional 3-credit honors thesis courses taken in sequence, fall/spring of the senior year. It is a special two-semester course sequence designed for the most talented and motivated department majors who wish to develop a capstone project during their senior year. The BA with Honors consists of 39 hours in art and design, of which 30–33 are in studio and 6–9 in art history.

Bachelor of Fine Arts Degree in Studio Art and Design

The BFA program in art and design is intended for the student who wishes to pursue a professional career in the visual arts. The program is organized into a four-year sequence of study that provides a solid understanding of art and art history. The student has an opportunity to explore a variety of curricular options and then chooses an intensive and professional major concentration (studio art, visual communication design, or industrial design). In addition to a primary concentration, BFA students are encouraged to select a secondary area of interest to broaden their thinking and to enrich their creative study. BFA candidates share a close working relationship with the department’s faculty who are active professional artists and designers. Intensive studio work is complemented by an academic education with strong art history and liberal arts component. The BFA degree consists of 66 credit hours in art, of which 54–57 are in studio and 9–12 in art history.
Art, Art History, and Design

BFA Freshman and Sophomore Years
Students beginning in the program are required to complete a studio core curriculum during their first two years. Five of these courses are mandated: Drawing I, Figure Drawing or Advanced Visualization, 2D Foundations, 3D Foundations and Photography I. The remaining two studio courses are optional, based on the student's interest. This intensive curriculum establishes a base for the studio practices and principles for all visual art expression. At the end of the fourth semester, students who have earned a minimum 3.25 grade point average in their studio courses will be accepted as candidates for the BFA degree. Students who do not qualify are eligible for the BA degree.

BFA Junior and Senior Years
Students accepted into the BFA program begin a two-year primary concentration in one of the following areas: ceramics, visual communication design, industrial design, painting, photography, printmaking, or sculpture. The concentration requires 15 hours of study in a major concentration area during the last four semesters. Teaching in the major is highly individualized and stresses the creative development and preparation of the student for the professional world. In addition to pursuing a concentration, all BFA majors must enroll in the BFA Seminar and the Senior Thesis courses. The culmination of the BFA degree is the completion of a senior thesis. This two-semester senior project, directed by a faculty member, will be exhibited and approved by the faculty as a requirement for graduation.

MINOR IN STUDIO ART
The minor in studio art is intended for the student who wishes to add studio art experience to their undergraduate studies. Freshmen, Sophomores and Juniors are eligible to declare a minor in studio art, which requires 15 credit hours, or 5 courses in studio art. Before being able to declare a minor, a student must be enrolled in or have already taken one of the following: Drawing I, 2D Foundations, or 3D Foundations.

As with the major, students seeking the minor may elect either a general or focused course of study; that is, students may take the four studio courses selected from among any of the studio disciplines (ceramics, painting, photography, printmaking, sculpture) or they may take four studio courses from within a single discipline. Because the Department offers multiple entry-level courses, students are able to enter the program at a variety of points.

STUDIO ART AND DESIGN CONCENTRATIONS

Studio Art Concentration
The Studio Art major is designed both for the student artist and the student interested in art as a second major or minor. Courses are offered in painting and drawing, ceramics, photography and video, printmaking, and sculpture. The Studio Art major provides an excellent basis for continuing work in graduate school and pursuing art-related fields such as design, art criticism, teaching, museum and auction house work, art therapy, media and publishing, commercial photography, exhibition design, and advertising. The Studio Art major provides students with an opportunity to develop the techniques, visual sensibility, and historical understanding necessary for working with various materials. The mission of the major is to provide students with intellectually informed, hands-on instruction in creative studies within the context of a liberal arts university. One of the inherent values of visual art is that by giving tangible form to the social, political, and private aspects of human existence, it makes visible the invisible; it provokes the expansion of intellectual boundaries, gives form to complex ideas, reveals deep but abstract emotions and extends our capacity to comprehend the lives of others. Each of the programs in our department offers a distinct means of confronting and understanding the important visual aspects of our wider engagement with and construction of the world.

Ceramics Concentration
Ceramics is a concentration emphasizing clay and glaze as the primary vehicles for expression. Traditional pottery, vessel making, and sculpture may be addressed through a variety of processes that include hand building, throwing, and casting. Students are encouraged to develop technical skills and a direction of their own choosing. In addition to traditional ceramic materials and processes, students will be encouraged to utilize other sculptural media, as well as become familiar with contemporary and historical source material that will inform their own directions in ceramics.

Painting Concentration
Painting, with its many traditions, is a medium put to an extraordinary diversity of contemporary uses. Capable of representing everything from the material to the intangible, painting continues to be a means for artists of vastly different interests to address their subjects in highly individual ways. The painting concentration at Notre Dame fosters the aesthetic, critical, and technical development of each student through a program of course work, independent study, and regular critiques. Emphasis is placed on being well-versed in contemporary critical issues, on articulating individual themes, and on developing the technical means to give visual form to thematic concerns.

Photography Concentration
Images are arguably the most important documents of the 21st century, operating at the intersection of communication, commerce and culture. The photography program educates students to be technically skilled, visually literate and creatively prepared for a world where photography, video and streaming media permeate our everyday experiences. Beginning with foundation work through senior thesis, courses are designed to inform students about photographic traditions while engaging them in the critical issues and methodologies of contemporary practice. The photography major prepares students for a career in visual media (including fine art, media communications or advertising), education or institutional professions at galleries, museums or auction houses.

Printmaking Concentration
Printmaking is a vital, visual, graphic process by which one may engage in a conversation with the world. In fact, printmakers all over the world are in constant contact, exchanging exciting information and keeping current with the ever-shifting flow of ideas. Printmakers’ work encompasses a wide range of practice: from stenciled art spray painted on a sidewalk to very fine prints made on paper, from a one-inch square print to wrapping an entire building in a print. Printmakers are involved with a very dynamic form of art.

At Notre Dame, students learn about current cultural and critical issues and how printmaking addresses them. As students learn about the various matrices, techniques and technologies of a wide range of printmaking (including relief, photolithography, intaglio, screen-printing, digital processes, papermaking and the making of books), they will develop their aesthetic, critical and technical skills.

Sculpture Concentration
Sculpture today encompasses diverse materials and contexts for the expression of ideas in space. Within this broad description, students are encouraged to develop the technical skills that will help them expand their ideas into thoughtful individual expression. We embrace a breadth of vision and experience, which will challenge the student to investigate and respond to contemporary issues through problem-solving. A full range of traditional and non-traditional media are available in specific courses and through individual mentoring. By blending required and elective courses and independent study, students can experience a curriculum that responds to their particular needs and direction.

Design
Design is the order of form and the control of function; it is what designers do. Humans are conditioned to make decisions on the basis of appearance and contextual input, accepting or rejecting information and material goods in response to a variety of visual cues. Effective, user-centered design can do more than attract interest or manipulate perception: it can enable people. Good design and careful planning can promote understanding, simplify use, improve safety, instill confidence, add value, and create community.

At Notre Dame, undergraduate design education begins with immersion into the liberal arts curriculum. This social, philosophical, critical, ethical, and historical experience helps build a foundation
of cultural understanding that naturally informs the creative and problem-solving methods. Responsible designers, consequently, approach the development process with sensitivity for human need, human aspiration, and the functional requirements for both production and implementation. At its best, design serves the spectrum of needs from individuals to constituencies in industry, society, and the global environment.

Though design has been part of the Notre Dame curriculum since the early 1950s, students enjoy the advantages of a campus that provides access to current technologies. Technically advanced collaborative teaching spaces and digital labs support all student design activities, including an on-site 20-station 2D computer studio, a 16-station 3D computer studio, and a high performance digital imaging studio, all maintained by the services from Notre Dame’s Center for Creative Computing. In addition, a model shop provides rapid prototyping capabilities ranging from traditional hand tools to precision computer controlled fabrication and 3D printing. Intermediate and advanced level undergraduate students share an energized design community with defined studio spaces located in close proximity to all design-related resources and facilities in the Design Center at West Lake Hall.

**Visual Communication Design Concentration**

At its most basic level, visual communication design is a creative process that combines the visual arts and technology to communicate ideas. In the hands of a talented designer, these ideas are transformed into visual communication that transcends mere words and pictures. By controlling color, type, movement, symbols, and images, the designer creates and manages the production of visuals designed to inform and persuade a specific audience. By combining aesthetic judgment with project management skills, designers develop visual solutions and communications strategies. The professional designer works with writers, editors, illustrators, photographers, code writers, and printers to complete compelling designs that effectively communicate a message.

At Notre Dame, the undergraduate visual communication design curriculum begins with a foundation in the liberal arts. Such a basis is a design student’s best path to meet and solve the varied communication challenges inherent in today’s complex world. Because a design solution may emerge from the humanities, an algorithm, or a scientific discovery, the curriculum provides a student with the opportunity to be firmly grounded in the fundamentals of design and the visual arts, while also taking courses in science, math, history, philosophy, and theology. As students progress through the tiered design program, they develop as a designer, as an intellectual, and as a moral person, prepared to address the social, ethical, and political circumstances influenced by the design profession.

At its core, the Notre Dame visual communication design program asserts that the designer can make a difference not only in the strategic plan of a business but also in the world. During their time on campus, students develop projects that aspire to positively influence the lives of culturally diverse people, critique the ethical dimensions of contemporary culture, and use visual form to complex social issues. As design professionals, Notre Dame graduates will be responsible for the future of our visual culture.

**Industrial Design Concentration**

Industrial designers give form to virtually all mass-manufactured products in our culture. They seek opportunity and advantage through identifying and solving problems. Their creative contributions impact the utility, appearance, and value of our tools and environment. Their most innovative solutions lie at an intersection of what is knowable and what is possible.

The industrial design profession demands excellent organizational skills, an awareness of visual and tactile aesthetics, human behavior, human proportion, material, process, and the responsible appropriation of resource, during and after use. Designers express conceptual proposals through a combination of well-developed drawing, physical modeling, computer modeling, writing, and verbal skills. Designers best serve the consumer through sensitive and innovative collaboration with art, science, engineering, anthropology, marketing, manufacturing, and ecology. Properly implemented, industrial design affords greater benefit, safety, and economy to all participants and recipients impacted by the product development cycle.

Notre Dame’s Industrial Design Program (NDID) is accredited by the National Association of Schools of Art and Design (NASAD) and maintains student chapter affiliation with the Industrial Designers Society of America (IDSA). NDID interacts with regional, national, and international corporate design and consulting offices in the form of annual conferences, sponsored projects, field trips, and internships.

**MINOR IN COLLABORATIVE INNOVATION**

The Minor in Collaborative Innovation offers students a dynamic catalyst for process-based, cross-disciplinary collaboration and learning between various academic departments in Arts & Letters, and wider disciplinary interests across the university. The minor seeks to build a strong core competency in design thinking and collaborative innovation to meet the growing demand for this skill among these various communities, attracting broad and diverse student enrollment and re-establishing the primacy of a humanistic, collaborative approach to the complex problems and integrated challenges facing a rapidly changing world.

The minor offers a five-course sequence starting with **Design Matters**, a large, introductory, lecture-based design-thinking. Declared minors will then cycle through a series of four additional courses introducing students to the various skillsets implicated in design thinking including research methods, visualization, and entrepreneurship. The minor culminates in the capstone course **Collaborative Product Development**, bringing the minor’s various disciplines (1st majors) together in fruitful collaboration with design majors to address industry sponsored projects addressing real world questions.

Fifteen credit hours are required for completion of this minor:

- 3 credits—DESN 20203 “Design Matters—Introduction to Design Thinking” (Students may not declare the minor until they are enrolled in or have completed this course.)
- 3 credits—DESN 41201/41202 “Collaborative Product Development” (capstone course required for all minors)
- 3 credits—DESN 20204 “Design Research Practices”
- 6 credits—designated two course sequence in either ID or VCD.

**THE ART HISTORY MAJOR**

Notre Dame’s art history major is designed to equip our students with a broad overview of the development of Western art and to provide them with an in-depth knowledge of particular periods, problems, and research methods. The diversity and scholarly strength of our faculty and the research facilities of the Hesburgh Library, including the Medieval Institute, are supplemented by the rich resource of the Snite Museum of Art. With a permanent collection of over 21,000 works, the Snite Museum not only gives our students an invaluable firsthand acquaintance with important examples from all periods and many cultures—including distinguished collections of old master drawings, 19th- and early-20th-century photographs, and Pre-Columbian art—but also provides a wide range of opportunities for our students to gain practical museum experience in both volunteer and paid positions.

The University of Notre Dame offers a 33-hour Honors Program (11 courses), a 30-hour first major (10 courses), a 24-hour (8 courses) supplementary major in art history, and a 15-hour minor (5 courses). These degrees are intended not only for students who are already intent upon pursuing a career in an art museum or gallery or at a college or university professor, but also for those individuals who simply wish to learn more about Western civilization through the examination of some of its most beautiful, provocative, and informative objects.
Departmental Honors in Art History and the Senior Thesis

The Honors Program will consist of 33 hours, as compared to 30 hours in the regular first major. First majors with a grade point average of 3.667 or above in Art History courses may petition the faculty for permission to enter the Art History Honors Program contingent upon maintaining this GPA level and the successful completion of an Honors Thesis. The student who wishes to be considered for departmental honors must select a thesis advisor with whom the student has taken courses in the area of specialization for the thesis. The student must petition the faculty with a one-page letter by the 10th week of the spring semester of the student’s junior year. The letter should be addressed to the Director of Undergraduate Studies for Art History. In the letter the student should give a brief indication of with whom and on what they are proposing to write her/his thesis and a brief account of her/his future plans. If the faculty approves, then in place of one of the elective art history courses or seminars the student will sign up for six credit hours of Honors Thesis credit, taking three hours in the fall semester of their senior year and three hours in the spring semester of their senior year.

Students who maintain the required 3.667 or higher GPA and successfully complete a senior thesis with a grade of A– or higher will earn Honors in Art History.

Art History First Major
Art history first majors are required to take two 20000-level courses, four 30000-level courses, and one 40000-level course. Additionally, students must also take three art history courses at any level.

Art History Supplemental Major
Students wishing to complete a second major in art history must take two 20000-level courses, four 30000-level courses, one 40000-level course, and one art history course at any level.

Art History Minor
Students wishing to minor in art history can do so by taking five art history courses (15 credit hours total). Courses consist of two 20000-level courses and three 30000-level courses.

Course Descriptions
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:
- Art History
- Art Studio
- Design

Course descriptions can be found by clicking on the subject code and course number in the search results.

Classics

Chair:
Luca Grillo

Professors:
W. Martin Bloomer; Luca Grillo; Li Guo
(Arabic)

Associate Professors:
Christopher Baron; Luca Grillo; David Hernandez; Brian A. Krostenko; Elizabeth Forbes Mazurek; Hildegund Müller; Catherine M. Schlegel

Concurrent Professors:
Felipe Fernández-Armesto; John Fitzgerald; Robin Jensen; David O’Connor; Gretchen Reydams-Schils; Ingrid Rowland; Christopher Shields

Concurrent Associate Professors:
David Gura; Blake Leyerle; Andrew Radde-Gallwitz; Robin Rhodes

Assistant Professors:
Hussein Abdulsater (Arabic); Aldo Tagliabue

Teaching Professors:
Ghada Bualuan (Arabic); Tadeusz Mazurek

Assistant Teaching Professors:
Catherine Bronson (Arabic)

The Department. The Department of Classics offers courses in the languages, literatures, archaeology, history, religions, and civilization of the ancient world. Cooperation with other departments of the college makes available to Classics students additional courses in the art, philosophy, and political theory of antiquity. Visit us online at classics.nd.edu.

The department also provides the administrative home for the Program in Arabic and Middle Eastern Studies.

MAJORS IN CLASSICS

Classics majors encounter at their sources the perennial cultures of Greece and Rome, cultures that continue to exercise a profound influence on Euro-American civilization. Classical training imparts enhanced skills in close reading and analysis of literary and rhetorical forms, as well as repeated experience of the integration of literature, history and ancillary studies. Thus, a major in Classics provides the archetypal humanistic education and an ideal preparation for entry into any of the professions that require mastery of language, close analysis of documents and integration of multiple details.

The lower-level courses equip the student with basic knowledge of languages and with a consciousness of ancient history and culture. Advanced courses in Latin and Greek literature and Ancient Civilization provide opportunities for more focused and detailed study and are conducted in a seminar format with emphasis on research and writing.

In addition to the other University requirements, students majoring in Classics will, under normal circumstances, complete at least 10 courses (30 credit hours) in one of two areas of concentration: Classics or Greek and Roman Civilization.

Classics Major
5 courses in Greek or Latin language/literature:
20003 and above* 15
2 courses in non-primary language
(Greek or Latin) 6
1 course in Greek or Roman History 3
2 Classics courses in English translation (CLAS) 6

*Students will typically choose one of the two classical languages, ancient Greek or Latin, in which to fulfill the language requirement at the advanced level. They will be required to take at least two semesters in the other language at the appropriate level. If students have sufficient background in both languages, it should be possible for them to complete the requirements of the major through a combination of intermediate and advanced courses in both languages, as long as the total number of language courses equals seven (21 credit hours) for the first major and five (15 credit hours) for the supplementary major.

Supplementary majors in Classics will be exempt from the two courses in the second classical language.

Greek and Roman Civilization Major
The History of Ancient Greece 3
The History of Ancient Rome 3
1 course in ancient archaeology 3
1 course in ancient literature 3
6 Classics courses in English translation (CLAS) or Greek and Latin language offerings* 18

*Students will be strongly encouraged, but not required, to include some language study in their six elective courses.

Supplementary majors in Greek and Roman Civilization are required to take only four elective classics (CLAS) courses in English translation or in Greek/Latin language.

MINORS IN CLASSICS

Minors provide students majoring in other areas with structure and certification for a variety of approaches to the study of Greek and Latin language, literature, and civilization.

Latin Minor
The Latin Minor provides a solid grounding in the philological and literary study of Latin texts of the classical period, or, for those who prefer, of Christian Latin literature. It consists ordinarily of five courses (15 hours) in intermediate or advanced Latin (CLLA 20003 and above). Students interested in later Latin texts are directed to the joint offerings of the department and the Medieval Institute.
Greek Minor
The Greek Minor provides a solid grounding in the philological and literary study of Greek texts of the classical and Hellenistic periods. It consists ordinarily of five courses (15 hours) in intermediate or advanced Greek (CLGR 2003 and above).

Minor in Classical Studies: Greek and Roman Civilization
The Classical Studies (Greek and Roman Civilization) minor focuses on the history and culture of the classical world. The minor consists of three required courses (one in Greek history, one in Roman history, one in ancient archaeology) and two electives from CLAS courses, whether offered by the department or cross-listed by other programs, or from Greek and Latin language courses, and may include classes in philosophy, art, architecture, political theory, literature or law, at the discretion of the Director of Undergraduate Studies.

Minor in Classical Studies: the Classical Heritage
The Classical Studies (Classical Heritage) minor allows students to connect the study of classical antiquity with other disciplines and periods and especially to study the inheritance and transformation of the classical tradition in areas like patristics, philosophy, late antiquity, and later Western art and literature. The minor consists of five courses: one with a chiefly historical orientation; one with a chiefly literary orientation; and three others approved by the Director of Undergraduate Studies, which may be taken from inside or outside the department.

SENIOR THESIS/HONORS TRACK
Classics majors are admitted into the honors track by approval of the Director of Undergraduate Studies. To receive honors, a student must (1) complete all requirements for the major; (2) maintain a GPA of at least 3.65 in the major; (3) complete the Honors Seminar for the senior year; (4) and receive a grade of A– or higher for a 5,000–6,000 word honors thesis. Honors students work closely with a member of the Classics faculty, who guides their research project. For more information see http://classics.nd.edu/undergraduates/honors-and-research/.

PROGRAM IN ARABIC AND MIDDLE EASTERN STUDIES
The program in Arabic and Middle Eastern studies offers a full range of courses in Modern Standard Arabic, and is geared toward proficiency in listening, speaking, reading, and writing. Courses in the regional dialects and Classical Arabic are also offered. Courses in the history, literature, cultures, and religions of the Middle East complement the language component and give students the opportunity for a broad-based and comprehensive understanding of the Arab world.

Major in Arabic
A total of 36 credit hours distributed in the following areas:

- 6 courses in Arabic 24
- 1 course in literature, taught by the Arabic faculty 3
- 1 course in Middle East history, taught by the Arabic faculty 3
- 1 course in Islam, taught by the Arabic faculty 3
- 1 elective, subject to departmental approval 3

Major in International Economics in Arabic
The new undergraduate major in International Economics in Arabic is a collaborative effort between the Department of Economics and the Classics Department. In pursuing this major, students take a minimum of eight economics courses and are also required to enroll in a one-credit “Exploring International Economics” course, preferably in their sophomore year. Designed to foster the integration of the study of culture with the study of economics, details about the requirements for this major can be found online at economics.nd.edu/undergraduate-program/academic-programs/majors/ic/.

Minor in Mediterranean/Middle East Studies
An interdisciplinary focus defines this broad-based program that encourages a multidimensional approach to the Mediterranean world. This is achieved through a wide variety of courses and activities offered by departments that study southern Europe, North Africa, or the Middle East.

While language courses may serve as a component of the minor, students are offered opportunities to view the region in its full historical, cultural, and political context. In this way, students are given the opportunity to assemble a course of studies that best reflects their own interests.

Typical areas of focus might include the rich culture that developed in southern Spain as a result of the Christian, Muslim, and Jewish interactions there; the impact of the French language and culture on North Africa and the Middle East; or the contemporary Israeli-Palestinian conflict.

Requirements: (1) Intermediate Arabic (MEAR 2003); (2) the student’s choice of three courses that relate to the region of southern Europe, North Africa, or the Middle East; and (3) a final research thesis in consultation with the Arabic faculty that integrates coursework related to the student’s area of interest.

STUDY ABROAD
Our students are encouraged to study abroad for a semester, especially in the Mediterranean basin at Notre Dame’s Rome Global Gateway. The Department also supports programs offered by the Intercollegiate Center for Classical Studies in Rome, College Year in Athens, through the Jerusalem Global Gateway, and in Arab-speaking countries. Credits earned for course work taken in approved programs can be used to fulfill our major and minor requirements. Studying abroad during the summer is also possible. Grants are available on a competitive basis for summer language study through the Center for the Study of Languages and Cultures and the Nanovic Institute for European Studies. For more information see classics.nd.edu/summer-programs/ or arabic.nd.edu/undergraduate-program/beyond-the-classroom/.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- Classics in Translation
- Greek Language and Literature
- Latin Language and Literature
- Arabic Language and Literature
- Middle East Studies

Course descriptions can be found by clicking on the subject code and course number in the search results.
Computer Science

Program Director
Aaron Striegel, Professor, Computer Science and Engineering

Program Website
bacs.nd.edu

Faculty
The Bachelor of Arts in Computer Science is interdisciplinary by nature and benefits from the scholarly contributions of a large number of Notre Dame faculty representing an array of academic departments.

Program Overview
The Bachelor of Arts degree in Computer Science (BACS) is intended for students who desire a strong liberal arts program with a concentration in computer science. It is suitable for students who expect to apply the principles of computing in a discipline within the humanities, social sciences, or natural sciences, but are not necessarily seeking the specialization that is typically offered in a traditional engineering curriculum. The BACS degree program contains the fundamentals of computer science, including algorithms, structured programming, data structures, programming languages, and software engineering.

Graduates of the Bachelor of Arts in Computer Science will:

- Apply their education in computer science to pose questions in and derive solutions for humanistic, social, and scientific problems.
- Account for ethical and social concerns when solving humanistic, social, and scientific problems.
- Develop knowledge in a secondary cognate area of their choosing.
- Function effectively in a collaborative team and effectively communicate with members of the team.
- Engage in continued education in their field of expertise.
- Attain positions of leadership in their chosen field.

Program Requirements
The BACS major requirements are listed below:

1. Completion of University Core Curriculum requirements. CSE 10001 may not be used to fulfill the University Science & Technology core requirement, due to its strong similarity in coverage to CSE 20311.

2. Completion of College of Arts and Letters requirements.

3. Completion of Major-specific mathematics requirements: MATH 10550, MATH 10560, and six or more credits of mathematics coursework from MATH 20550 (Calculus III), Math 20610 (Linear Algebra), MATH 20580 (Linear Algebra with Differential Equations), ACMS 30440 (Probability and Statistics), ACMS 30530 (Introduction to Probability). Petitions to accept other Math or ACMS courses for this requirement will be considered, but introductory mathematics courses will generally not be approved. Restrictions (e.g., credit cannot be granted for both MATH 20610 and MATH 20580) will apply. Students arriving with transfer credit in MATH 10550 and MATH 10560 must choose at least one math course that satisfies the Quantitative Reasoning requirement in the University Core Curriculum.

4. Completion of Computer Science and Engineering coursework (35 credits)
   b. 12 hours (typically four courses) of CSE electives: All electives must be taken at the 30000 level or higher, and all associated prerequisite requirements must be satisfied. Students are expected to make elective course selections in consultation with their academic advisor, reflecting their interests and, where possible, facilitating intellectual points of contact between computer science and the cognate area.

5. Completion of Cognate area of study (15 or more credit hours): A cognate area of study should comprise a coherent set of courses. Courses in the cognate area must embody an area of knowledge outside of the computing disciplines. The selected cognate area and its courses must be approved by the BACS program director or designee in consultation with the relevant department(s), using criteria intended to ensure depth of study in the cognate area. Students will be encouraged to explore the places of intellectual contact between the approved cognate area and CS. Arts and Letters minor programs of 15 credit hours or more will satisfy the cognate requirement, with the exception of the CDT and Data Science minor programs which are excluded because of disciplinary proximity. Arts and Letters major or supplementary major programs will also satisfy the cognate requirement. Students may also submit their own slate of courses for approval.

6. Thesis: Students are encouraged to develop and execute a senior thesis that explores a topic at the interface between computer science and the cognate area. The thesis should be developed by the student in consultation with one or more faculty mentors (ideally with expertise in CS and the cognate area) and must be crafted and delivered in accordance with the policies of the College of Arts and Letters.

Admission
Students apply to the BACS degree in the spring of their first year of study. All first-year students are eligible to apply. Applicants are competitively selected for a limited number of slots based on an essay, first year performance, and past computing experience. Further information about the application process can be found at the program website.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the appropriate subject (Computer Science, cognate area, etc.). Course descriptions can be found by clicking on the subject code and course number in the search results.
East Asian Languages & Cultures

Chair:
Yongping Zhu
Professor:
Michael Hockx
Professor Emeritus:
Liangyan Ge
Associate Professors:
Michael C. Brownstein; Lionel M. Jensen; Xiaoshan Yang; Yongping Zhu
Assistant Professor:
Xian Wang
Teaching Professors:
Noriko Hanabusa; Chengxi Yin; Yeonhee Yoon
Associate Teaching Professor:
Hana Kang
Assistant Teaching Professors:
Naoki Fuse; Congcong Ma; Sayako Uehara; Weibing Ye

Mission Statement: The peoples of East Asia comprise one quarter of the world’s population and account for a similar proportion of the world’s production and consumption. This, along with the contemporary fusion of Asia and the West politically and economically, makes knowledge of the diverse languages and cultures of East Asia vital to an understanding of our global community and indispensable for the preparation of careers in the Pacific Rim. The Department of East Asian Languages & Cultures provides the resources and instruction necessary for success in these areas. The department is dedicated to providing rigorous language training in Chinese, Japanese, and Korean, as well as courses taught in English on Chinese, Japanese, and Korean philosophy, religion, literature, and culture. Complementary courses in other disciplines are listed in this Bulletin under departments such as history, philosophy, theology, political science, economics, and anthropology.

Completion of the fourth semester of Chinese, Japanese, or Korean (Second Year Chinese II, Second Year Japanese II, Second Year Korean II) will satisfy the language requirement for both the College of Arts and Letters and the College of Science. Although the College of Business does not have a language requirement, it strongly supports integration of language courses into its curriculum and encourages students to participate in the study abroad programs (See “Study Abroad” under Mendoza College of Business).

Placement and Language Requirement. Students who wish to enroll in a Chinese, Japanese, or Korean language course beyond the 10111 or 10112 level must take a placement examination administered by the Department. Students testing out of 10xxx-level language courses must complete at least one course at the 20xxx level or higher to satisfy the language requirement.

PROGRAM IN CHINESE AND CLASSICAL CHINESE

The program in Chinese offers language classes in Mandarin Chinese at the first-, second-, third-, fourth-year and advanced levels and classical Chinese, and readings in Chinese modern classics as well as courses in English on classical and modern Chinese literature and culture. Qualified students also have the opportunity to attend East China Normal University in Shanghai; Peking University in Beijing, People's Republic of China; and Fu Jen University in Taipei, Taiwan.

The Chinese program offers first and supplementary majors and a minor.

Basic requirements: For the major, students must complete 30 credit hours, including third-year Chinese. For the supplementary major, students must complete 24 credit hours, including third-year Chinese. For the minor, students must complete 15 credit hours, including two semesters of language classes beyond the first-year. 10xxx-level language courses and University seminars on China-related topics do not count toward the major, supplementary major, or minor.

Other requirements: In addition to the language course requirements described above, all majors must take three upper-division 3-credit courses in Chinese literature and Chinese culture taught by EALC faculty, including at least one literature course. Any exception must be approved by the Director of Undergraduate Studies. Remaining credit hours may be satisfied by taking additional Chinese language and culture courses, or other East Asia-related courses approved by the Director of Undergraduate Studies.

THE HONORS TRACK IN CHINESE

Majors in Chinese are strongly encouraged to pursue the honors track. Those who are interested must meet the following criteria:

1. Fulfillment of all the requirements for a first major of 30 credit hours in Chinese;
2. A cumulative GPA of at least 3.3 and a GPA of at least 3.7 in the major, or permission from the department chair;
3. Completion of fourth-year Chinese.

Program Requirements: In addition to the 30 hours required for a major, the honors track requires the completion of a senior honors thesis that demonstrates the student's originality and ability to do research in the target field. This means to graduate with departmental honors, the student must earn 33 hours of credit in the major.

Students are admitted into the honors track in the spring semester of their junior year. The senior honors thesis is a year-long, one-on-one experience with a faculty mentor that comprises two semester courses of 3 credit hours each.

PROGRAM IN JAPANESE

The program in Japanese offers language classes in modern Japanese at the first-, second-, third-, and fourth-year and advanced levels, as well as courses in English on classical and modern Japanese literature and culture. Qualified students also have the opportunity to attend Nanzan University in Nagoya, and Sophia University in Tokyo, Japan.

The Japanese program offers first and supplementary majors and a minor.

Basic requirements: For the major, students must complete 30 credit hours, including two semesters of third-year Japanese. For the supplementary major, students must complete 24 credit hours, including third-year Japanese. For the minor, students must complete 15 credit hours, including two semesters of language classes beyond the first year. 10xxx-level language courses and University seminars on Japan-related topics do not count toward the major, supplementary major, or minor.

Other requirements: In addition to the language course requirements described above, all majors must take three upper-division 3-credit courses in Japanese literature and Japanese culture taught by EALC faculty, including at least one literature course. Any exception must be approved by the Director of Undergraduate Studies.

THE HONORS TRACK IN JAPANESE

Majors in Japanese are strongly encouraged to pursue the honors track. Those who are interested must meet the following criteria:

1. Fulfillment of all the requirements for a first major of 30 credit hours in Japanese;
2. A cumulative GPA of at least 3.3 and a GPA of at least 3.7 in the major, or permission from the department chair;
3. Completion of fourth-year Japanese.

Program Requirements: In addition to the 30 hours required for a major, the honors track requires the completion of a senior honors thesis that demonstrates the student's originality and ability to do research in the target field. For this endeavor, the student will receive 3 hours of graded credit. This means to graduate with departmental honors, the student must earn 33 hours of credit in the major.

Students are admitted into the honors track in the spring semester of their junior year. The senior honors thesis is a year-long, one-on-one experience with a faculty mentor that comprises two semester courses of 3 credit hours each.

To Table of Contents
EALC faculty.

including at least one literature course taught by
division courses in Japanese literature and culture,
the fourth-year level, including the two one-credit
four semesters of Japanese language courses through
economics. Students must complete a minimum of
integration of the study of culture with the study of
ably their sophomore year, designed to foster the
"Exploring International Economics", prefer-
courses and are also required to enroll in a one-credit
major, students take a minimum of eight economics
courses and are also required to complete a one-credit
four semesters of Chinese language courses through
Economics is a collaborative effort between the

Japanese is spoken.

to the economic, linguistic, and cultural
related to a country or countries where
the guidance of a faculty member from Economics
or East Asian Languages and Cultures or a research
seminar paper that focuses on a topic or topics
related to the economic, linguistic, and cultural
characteristics of a country or countries where
Chinese is spoken.

Refer to the Department of Economics for the
relevant course requirements in economics, which
include satisfying a mathematics requirement of
Calculus I and II and successful completion of
ECON 10010/20010; ECON 10020/20020;
ECON 30010; ECON 30020; ECON 30331; and
two of the following: ECON 40700, ECON 40800,
ECON 40710 and ECON 40720.

PROGRAM IN KOREAN

The University offers four years of Korean language
instruction and a number of courses relating to
Korean culture. Students who finish the sequence
at Notre Dame are encouraged to continue their
language study abroad. For the minor in Korean,
students must complete 15 credit hours, including
at least two semesters of Korean language beyond
the first year, and one course in Korean culture. The
remaining credit hours may be filled by additional
courses in Korean language or culture courses offered
by the department, or by courses approved by the
Director of Undergraduate Studies.

ASIAN STUDIES SUPPLEMENTARY MAJOR
AND MINOR

For details, see the Keough School Global Affairs
section of the Undergraduate Bulletin.

MAJOR IN INTERNATIONAL ECONOMICS IN
CHINESE

The undergraduate major in International
Economics is a collaborative effort between the
Department of Economics and affiliated depart-
ments of languages and literature. In pursuing this
major, students take a minimum of eight economics
courses and are also required to enroll in a one-credit
"Exploring International Economics", prefer-
ably their sophomore year, designed to foster the
integration of the study of culture with the study of
economics. Students must complete a minimum of
four semesters of Chinese language courses through
the fourth-year level, including the two one-credit
fourth year supplements in Business Chinese.

Students must also take a minimum of three upper
division courses in Chinese literature and culture, including at least one literature course taught by
EALC faculty.

In their senior year, students have the option of
writing a senior capstone essay that integrates their
economic and language and culture study or taking
the two-semester sequence in advanced Japanese. The
senior capstone project may be a senior thesis under
the guidance of a faculty member from Economics
or East Asian Languages and Cultures or a research
seminar paper that focuses on a topic or topics
related to the economic, linguistic, and cultural
characteristics of a country or countries where
Japanese is spoken.

Refer to the Department of Economics for the
relevant course requirements in economics, which
include satisfying a mathematics requirement of
Calculus I and II and successful completion of
ECON 10010/20010; ECON 10020/20020;
ECON 30010; ECON 30020; ECON 30331; and
two of the following: ECON 40700, ECON 40800,
ECON 40710 and ECON 40720.

MAJOR IN INTERNATIONAL ECONOMICS IN
JAPANESE

The undergraduate major in International
Economics is a collaborative effort between the
Department of Economics and affiliated depart-
ments of languages and literature. In pursuing this
major, students take a minimum of eight economics
courses and are also required to enroll in a one-credit
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integration of the study of culture with the study of
economics. Students must complete a minimum of
four semesters of Japanese language courses through
the fourth-year level, including the two one-credit
fourth year supplements in Business Japanese.

Students must also take a minimum of three upper
division courses in Japanese literature and culture, including at least one literature course taught by
EALJ faculty.

In their senior year, students have the option of
writing a senior capstone essay that integrates their
economic and language and culture study or taking
the two-semester sequence in advanced Japanese. The
senior capstone project may be a senior thesis under
the guidance of a faculty member from Economics
or East Asian Languages and Cultures or a research
seminar paper that focuses on a topic or topics
related to the economic, linguistic, and cultural
characteristics of a country or countries where
Japanese is spoken.

Refer to the Department of Economics for the
relevant course requirements in economics, which
include satisfying a mathematics requirement of
Calculus I and II and successful completion of
ECON 10010/20010; ECON 10020/20020;
ECON 30010; ECON 30020; ECON 30331; and
two of the following: ECON 40700, ECON 40800,
ECON 40710 and ECON 40720.

EAST ASIAN LANGUAGES & CULTURES
STUDY-ABROAD PROGRAMS

Students have opportunities to study abroad for
a summer, a semester, or a year in the People's
Republic of China and Japan at the following
locations:

Beijing, China: The program at the University
of International Business and Economics affords
students an opportunity to improve their fluency
in spoken and written Mandarin Chinese through
intensive training. Participants must have completed
at least two semesters of college-level Mandarin or
the equivalent. The summer language program is run
by Notre Dame.

Shanghai, China: The program at East China
Normal University is generally designed for a semes-
ter (but it may be extended) that affords students
courses in Chinese language, literature, and culture.

Nagoya, Japan: The program at the Catholic
Nanzan University offers mandatory courses in
intensive Japanese, as well as related courses in litera-
ture, religion, business, economics, history, art, and
politics. The program is designed for sophomores
who have taken a minimum of first-year, intensive
Japanese (at the University of Notre Dame) or its
equivalent.

Tokyo, Japan: The program at the Catholic Sophia
University enables language majors to focus on their
language courses while, at the same time, affording a
wide-ranging selection of English-language offerings
in Asian Studies, international business, economics,
history, political science, art history, literature,
religion, philosophy, anthropology, and sociology.
Sophomores and juniors may participate.

COURSE DESCRIPTIONS

All of the courses associated with this academic
program can be found online at registrar.nd.edu/
students/class_search.php. The scheduled classes
for a given semester may be found by clicking on
"Class Search" and selecting one or more of the
following subjects:

• East Asian Languages & Literature
• Chinese
• Japanese
• Korean

Course descriptions can be found by clicking on
the subject code and course number in the search
results.
The program provides students with the insights of scientific analysis and social perspective to deepen their understanding of the complex economic forces at work in society. Such an understanding is an essential ingredient in the development of an educated person. The program is also designed to prepare the student for a variety of options after graduation, including graduate programs and managerial programs in business and finance.

Requirements for the Economics Major

(i) **Total Course Requirement**
Students must complete the two-semester Principles of Economics sequence (10010/10011/20010/20011 and 10020/20020 or equivalent). Beyond the Principles courses, the major requires a minimum of eight (8) additional course (24 credits) in economics at the junior/senior level (numbered 3xxx or 4xxx).

(ii) **Math Requirement**
A course in Calculus (MATH 10350 or equivalent) is a prerequisite for both of the intermediate theory courses. (See core requirement below). Simultaneous enrollment in Calculus II is permitted but not recommended.

**Recommendation:** It is strongly recommended that students, especially prospective economic majors, who have not had a course in Calculus I (MATH 10350 or equivalent) enroll in the calculus course during their first year of study.

(iii) **Core Requirement**
Students must include the following four courses among their minimum of eight courses in economics beyond the Principles course.

- 30010 Intermediate Economic Theory Micro
- 30020 Intermediate Economic Theory Micro
- 30031 Econometrics

(iv) **Advanced Course Requirement**
Students must include a minimum of two courses (6 credits) at the senior level (numbered 4xxx) that have either of the intermediate theory courses (30010, 30020) and/or Econometrics (30331) as a prerequisite.

(v) **Writing-Intensive Requirement**
In completing the minimum of 24 credits at the senior level (numbered 3xxx) the student must fulfill a writing-intensive requirement. This requirement can be satisfied in one of the following three ways: by taking a junior or senior 3xxx-level economics seminar course; by taking a three credit special studies course consistent with the college's writing-intensive guidelines under the direction of an economic faculty member; or by writing a senior honors essay under the direction of an economic faculty member.

Departmental advisors will assist students in designing a program of study that meets their educational and career goals. Students are also encouraged to pursue related courses in other departments of the College of Arts and Letters. The Mendoza College of Business and the College of Science. Materials relating to professional work or graduate study in economics, law, business, public policy, foreign service are available from the director of undergraduate studies.

Undergraduate Economics Honors Program

**Entry Gate.**
To be eligible for admission to the Undergraduate Economics Honors Program, the student must:

(i) Complete Intermediate Economic Theory-Micro (ECON 30010), Intermediate Macro Theory (ECON 30020), and Econometrics (ECON 30331) with minimum grade point average in these courses of A- (3.667).

or

(ii) Have a minimum cumulative GPA of 3.4 and minimum GPA of A- (3.667) in Principles of Microeconomics (ECON 10010/10011/20010/20011), Principles of Macroeconomics (ECON 10020/20021) Intermediate Economic Theory-Micro (ECON 30010), Intermediate Macro Theory (ECON 30020), Statistics for Economists (30340), and Econometrics (ECON 30331).

To apply for admission, the student must complete an application form, available from the director of undergraduate studies in Economics, between the end of the sophomore year and the end of the junior year. The application will include: (1) a paragraph explaining why the student wishes to enroll in the honors program, and (2) a signature by a member of the economics faculty who endorses this student's application. The application will be returned to the director of undergraduate studies in Economics who will make recommendations for admission to the Undergraduate Studies Committee, which is responsible for the final decisions.

**Enriching Experience.**
The Undergraduate Economics Honors Program requires that the student complete an enriching experience. The following qualify as an enriching experience:

(i) Completion with a grade B+ or higher of an "advanced methods" course, defined as a 4xxx-level course in which students are required to apply methods of modern economic research. A list of these courses is available from the director of undergraduate studies.

(ii) Completion with a grade of B or higher of a course in the core of the graduate program in economics.

(iii) Completion of some substantive out of classroom activity directly related to the study of economics, such as presentation of the student's own original research at an external conference, an undergraduate research assistantship, an internship, or community service.
Economics

All of these activities need to be pre-approved. Students who want pre-approval for a specific activity should submit a written request with other supporting material to the director of undergraduate students in Economics who will notify applicants of the committee's decision.

Capstone experience.
The capstone experience represents the final requirement for the Undergraduate Economic Honors Program. This experience involves three elements:

(i) Completion of a one-credit honors seminar (ECON 47961) in each semester of the senior year. The seminar not only provides instructional support for these students, but also requires each student to present progress reports to their peers at regular intervals. These seminar credits do not count as regular major (i.e., do not substitute for 3xxx or 4xxx-level course “economics courses”) and are graded on a Satisfactory/Unsatisfactory basis. These seminars are open to juniors in the honors program who want advanced insight to what the honors essay entails.

(ii) Participation in all College of Arts and Letters events for department honors students.

MAJOR IN INTERNATIONAL ECONOMICS

The undergraduate major in International Economics is a collaborative effort between the Department of Economics and the departments of languages and literatures affiliated with the International Economics major. In pursuing this major, students take a minimum of eight economics courses and seven to ten intermediate and advanced courses in one of the following languages: Arabic, Chinese, French, German, Italian, Japanese, Russian and Spanish. Students are also required to enroll in a one-credit course “Exploring International Economics” designed to foster the integration of the study of culture with the study of economics. Students must also complete a senior research project or equivalent designed to integrate their economic and language and culture study. The senior research project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a language. Details about the thesis/capstone project are determined by the relevant language department.

Students must satisfy a mathematics requirement of Calculus (MATH 10360 or equivalent) and successfully complete ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30340; ECON 30331; and two international economics courses as approved by the Director of Undergraduate Studies. Students should refer to their language department for specific language, literature and culture requirements.

Through the major, the collaborating departments seek to blend the programs of study to ensure that students will achieve advanced linguistic and cultural competency in a foreign language as well as excellent preparation in Economics. The balance of economics with languages and culture courses should attract motivated students and inspire them to undertake a challenging course of study that will prepare them for post-graduate studies and/or professional career opportunities in the international arena. International Economics majors will learn how aesthetic and cultural categories and value judgments are shaped by economic trends and political conditions and how political conditions and economic trends are influenced by aesthetic and cultural trends.

CONCENTRATIONS IN FINANCIAL ECONOMICS AND ECONOMETRICS

The Economics department also offers a concentration in Financial Economics and Econometrics. This selective program fills a need for additional training in applied quantitative economic reasoning. The coursework for the concentration will provide a fast-paced and rigorous training in financial economics that will prepare students for careers in investment management, banking, research, and policy-making.

Admission to the concentration will be selective, and Economics and International Economics majors in the College of Arts and Letters may apply. Applications for admission to the concentration should be submitted to the Economics Department by February 15 of a student’s sophomore year. The department will evaluate all applicants and will make admission decisions by March 15. Admission decisions will be based on factors including overall GPA, performance in prior economics courses, and mathematical background. Students should have completed intermediate microeconomic theory by the end of their sophomore year.

Students pursuing this concentration will be required to fulfill the core requirements of the Economics or International Economics majors, along with the additional requirement of the five classes—three core classes and two electives. These classes would jointly satisfy the electives requirements within the Economics or International Economics majors.

Core Classes
All students must take the following three courses:

- Financial Economics (ECON 40354)
- Asset Pricing
- Financial Econometrics

Upper level electives
All students are required to take financial economics electives approved by the Director of Undergraduate Studies.

The concentration will also offer additional out-of-classroom enrichment opportunities, such as presentations by outside researchers and practitioners. These events will complement the coursework by offering insights into the world of finance and of policymaking, and will be natural opportunities for networking and for career advancement.

THE MINOR IN BUSINESS ECONOMICS

The minor in Business Economics comprises 15 credits. It is open to students in the College of Arts and Letters. All students are required to take Principles of Microeconomics; Principles of Macroeconomics; Statistics; Introductory Accounting; and Introductory Finance. Students may count one of the above courses to fulfill a University requirement. Students may not double-count any of the above courses to fulfill the requirements of their major—but Psychology or Sociology majors can use their respective departmental statistics course to fulfill the statistics requirement of the minor. No more than one course in the minor may be taken at another institution. Prior approval is required for this and for transfer credit that is applied to satisfy the requirements of the minor. No AP credit will be accepted as a substitute for courses in the minor but may qualify a student for a higher level course. The minor is not open to students majoring in Economics.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Economics. Course descriptions can be found by clicking on the subject code and course number in the search results.
English

Department Chair:
Jesse Lander
Director of Undergraduate Studies:
Laura Betz
Director of Graduate Studies:
Kate Marshall
Director of Creative Writing:
Azareen Van der Vliet Oloomi
John and Barbara Glynn Family Professor of Literature:
Margaret Anne Doody
Reverend John J. Cavanaugh, C.S.C. Professor of the Humanities:
Stephen M. Fallon
Donald and Marilyn Keough Professor of Irish Studies, Emeritus:
Declan Kiberd
George N. Shuster Professor of English Literature:
Laura L. Knoppers
Donald R. Keough Family Professor of Irish Studies:
Barry McCrea
Coyle Professor of Literacy Education:
Ernest Morell
William R. Keenan Jr., Professor of English:
Valerie Sayers
Mary Lee Duda Professor of Literature:
Tim William Machan
Mary Lee Duda Professor of Literature, Emeritus:
John Sitter
William P. and Hazel B. White Professor of English:
Laura Dassow Walls

Professors:
Christopher Abram; Jacqueline Vaught Brogan (emerita); James M. Collins (concurrent); John Duffy; Christopher B. Fox; Stephen A. Fredman (emeritus); Dolores W. Frese (emerita); Barbara J. Green; Sandra Gustafson; Susan Harris; Peter Holland (concurrent); Greg P. Kucich; Tim Machan; John E. Matthias (emeritus); Joyelle McSweeney; Orlando Menes; William O’Rourke (emeritus); Mark Sanders; Steve Tomasula

Associate Professors:
Johannes Göransson; Romana Huk; Cyraina Johnson-Roullier; Michelle Karnes; William J. Krier (emeritus); Jesse Lander; Kate Marshall; Sara Maurer; Susannah Monta; Roy Scranton; Yasmine Solomonescu; David Thomas; Azareen Van der Vliet Oloomi; Elliott Visconsi

Assistant Professors:
Nan Da; Ian Newman; Sarah Quesada; Francisco Robles

Teaching Professors:
Laura Betz; Noreen Deane-Moran

Program of Studies. The English major features small classes in which students read, analyze, and discuss literary works, studying issues of literary and rhetorical, investigating the symbolic systems that shape cultural meaning, and exploring the broad range of human experience. Majors enjoy an atmosphere of immediate contact with the department’s regular teaching and research faculty, who advise students on their course of study. English courses give close attention to student writing, and nearly every majors-level English course is writing-intensive.

English majors choose careers in any field valuing the ability to read, write, and analyze with intelligence and subtlety. Many of our majors find careers in law, business, education, publishing, journalism, marketing, politics, and medicine, as well as myriad other fields. An increasing number of English majors go into service projects and programs such as Teach for America.

Major Requirements. The English major requires a minimum of 10 courses (30 credit hours). In completing the 10 courses, students must satisfy the following requirements:

Introduction to Literary Studies (ENGL 30101). This course, which introduces students to college-level study of literature, is a concurrent prerequisite for the major (i.e., students cannot take a major elective unless they have completed this course or are currently enrolled in it).

Elective courses. Nine English courses at the 30xxx level or above.

Distribution requirement. In selecting elective courses, students must fulfill the following distribution requirements:

History:
1 course in the period before 1500
1 course in the period 1500–1700
2 courses in the period 1700–1900
1 course after 1900

Culture:
1 course in British literature
1 course in American literature
1 course in a literature in English outside of Britain and the United States or in American ethnic minority literature

Genre:
1 course predominately concerned with poetry
2 courses predominantly concerned with 2 genres from the following list: fiction, drama or film, critical theory, nonfiction

A single course can fulfill the requirement in more than one distribution category, but it cannot fulfill more than one area within a single distribution category. For example, a survey of Renaissance literature might count for 1500–1700 (history), British literature (culture), and drama (genre), but would not count for both poetry and drama (two genre categories).

Creative writing courses may satisfy the genre requirement, but no more than two may count toward the major.

The number of courses needed to satisfy the distribution requirement will vary, depending on the courses the student selects, but not all electives need fulfill a distribution requirement.

Concentration in Creative Writing. The philosophy of the Department of English is that in order to produce good literature, you must know good literature. In order to complete the concentration, therefore, the student must be an English major and complete all of the requirements for the major.

Requirements. In addition to completing the requirements for the major, students must take four creative writing courses from a list approved by the department, three of which, if taken at the 30xxx or 40xxx level, may count towards the ten courses required for the English major. One 20xxx-level creative writing course may count toward the concentration. One of the four creative writing courses must be Advanced Fiction Writing (40850), Advanced Poetry Writing (40851), or Advanced Creative Nonfiction.

Admission to the Concentration. Students wishing to complete the concentration must apply to the department after taking two creative writing courses in accord with the guidelines above. The Creative Writing Committee will determine whether to admit students to the concentration on the basis of the recommendations of the instructors of those two courses. In cases in which it is not possible to obtain such recommendations, a student may supplement his or her application with a portfolio of creative writing.

English Major Honors Concentration. In the English Honors Concentration, select majors create programs tailored to their own particular interest. A faculty mentor guides each of these students through this intensive experience. The main feature of the concentration is writing an honors thesis consisting of a work of literary scholarship.

Eligibility. During the junior year, students are invited to apply to the Honors Concentration after being identified in one of two ways: achieving a GPA of 3.78 or higher in three or more English classes, or 3.6 or higher with a faculty nomination. Invited students declare their interest in the Honors Concentration by completing a Statement of Purpose, a 300-word statement describing what the student intends to focus on during the time in the Honors Concentration.

Requirements. The requirements for the Honors Concentration are slightly different from the prior listing of English major requirements. In the fall of senior year, the student enrolls in ENGL 53001, the Honors Colloquium, which counts for one of the ten courses of the English major; in the spring of senior year, the student enrolls in ENGL 52998, Honors Thesis Credits, to complete the writing of the thesis. The latter is in addition to the 30 hours required for the major.

English Major Honors Concentration in Creative Writing. Students in Creative Writing Honors complete a thesis consisting of a work of creative writing and a reflection on the process of producing it.

Eligibility. During the junior year, students are invited to apply to the Honors Concentration after
being identified in one of two ways: achieving a GPA of 3.78 or higher in three or more English courses, or 3.6 or higher with a faculty nomination. Invited students declare their interest by completing a 300-word Statement of Purpose describing the project the student intends to complete.

Requirements: Students must complete all of the requirements for the Creative Writing Honors Thesis Concentration. In the fall of their senior year, students take the Creative Writing Honors Thesis Colloquium (ENGL 53002); in the spring of the senior year, the student enrolls in ENGL 52999, Creative Writing Honors Thesis Credits, to complete the writing of the thesis. The thesis will consist of an abstract, a critical essay on the writing project (10–15 pages), approximately forty pages of prose (e.g., a section of a novel or a selection of short stories) or twenty pages of poetry, and a works cited.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject English. Course descriptions can be found by clicking on the subject code and course number in the search results.

Film, Television, and Theatre

Department Chair:
Bret A. Freedman

Endowed Professors:
McMeel Family Chair in Shakespeare Studies:
Peter Holland

Endowed Associate Professors:
The William and Helen Carey Chair in Modern Communication:
Anne Garcia-Romero

Professors:
James M. Collins; Donald Crafton (emeritus); BrionaNicDhùirmada (concurent); William Donahue (concurent); Jeff Godmilow (emerita); Peter Holland; Anton Juan; Mark C. Pilkington (emeritus); Pamela Wojcik

Assistant Professors:
Tarryn Li-Min Chun; Jeff Spoonhower; Nicole L. Woods (concurent)

Teaching Professors:
William Donaruma; Richard E. Donnelly; Siri Scott

Associate Teaching Professors:
C. Ken Cole; Michael Kackman; Theodore E. Mandell; Marcus Stephens

Assistant Teaching Professors:
Matt Hawkins

Ryan Producing Artistic Director, Notre Dame Shakespeare Festival:
Grant Mudge

Instructor:
Gary Sieber (adjunct)

The Department. The Department of Film, Television, and Theatre curriculum includes study of the arts of theatre and performance, film and video, and television. Our goal is to provide students with intellectual and intuitive resources for analysis and production of these performing and media arts. We seek both to encourage and inspire intellectual discipline and curiosity as well as to discover and nurture student creativity. We offer, therefore, both a scholarly and creative context for education of the general liberal arts student at Notre Dame as well as the individual seeking an intensive preparation for advanced study in these fields. In an interdisciplinary spirit of collaboration, students in this department investigate film, television, and theatre (and occasionally other media) as complex cultural phenomena to develop skills in analysis, evaluation, and theory formation as well as to engage in creative production.

Students graduating from this department have numerous postgraduate choices. Many of our graduates seek careers in law, medicine, business, education, public service, or other professions. Others will pursue careers in theatre, film, or television. However, we are not a professional training program. Rather, we seek to provide the creative and technological tools for student scholar/artists to build a basis for advanced study and professional careers in the arts should they so desire. It is our hope that those whose work and determination lead them to seek careers in these fields will be challenged and assisted by their liberal arts curriculum. Our courses provide tools to understand the analytical, technical and imaginative processes of the field, whether pursued as future work, study, or as an enhancement of intellectual life.

For more information and up-to-date listings of courses and FTT events, visit fttn.du.edu.

Program of Studies. Students interested in the major are encouraged to visit the departmental office (230 Marie P. DeBartolo Performing Arts Center) for information about the programs and department faculty. Step-by-step instructions for becoming a major are available on our website at fttn.du.edu. Students may elect to major in the department as either a first or second major in accordance with college guidelines.

Students concentrate in film, television or theatre. Ten courses are needed to complete the major. Each concentration has a core of required classes; subsequent electives may be taken from across the department. All majors are required to take at least one course primarily focused on non-US media or performance cultures or the study of identity and cultural power. Courses meeting this International/Identity requirement cover such topics as national cinemas or performance traditions, global and transnational cultural flows, migration and diaspora, and the study of race and ethnicity, gender and sexuality, disability, nationality and citizenship, religion, and/or age and generation.

The Department of Film, Television, and Theatre participates in several international programs by cross-listing courses and sponsoring internships. For more information, see the Bulletin descriptions for the international programs. Several courses are offered in the summer session, including Introduction to Film and Video Production. See the Summer Session Bulletin for availability and further information.

FTT majors are invited to apply during their junior year to complete a two-semester Senior Thesis project during their senior year. Upon completion of the project, as well as a one-credit writing workshop in the fall of their senior year, students will be eligible to receive the Honors designation upon graduation, provided their project is approved by the department Honors Committee.
FILM CONCENTRATION
10 courses (30 credit hours):
4 required core courses:
   Basics of Film and Television
   Global Cinema I
   Global Cinema II
   Critical Approaches to Screen Cultures
6 electives (3 at the 40000 level; one that carries International/Identity attribute)

TELEVISION STUDIES CONCENTRATION
10 courses (30 credit hours):
3 required core courses:
   Basics of Film and Television
   History of Television
   Critical Approaches to Television
7 electives (4 at the 40000 level; one that carries International/Identity attribute)

THEATRE CONCENTRATION
10 courses (30 credit hours):
3 required core courses:
   Collaboration: An Introduction to Making Theatre
   World Theatre I
   World Theatre II
7 electives (2 at the 40000 level; one that carries International/Identity attribute)

FILM AND TELEVISION ELECTIVES
Introduction to Film and Television Production
Film and Digital Culture
History of Documentary Film
Film and Popular Music
Digital Devices
Screenwriting
Media Internship
Writing the Short Film
La Telenovela
Shakespeare and Film
Intermediate Filmmaking
Digital Cinema Production
Advanced Digital Cinema Production
Walt Disney in Film and Culture
Contemporary Hollywood
Postmodern Narrative
Documentary Video Production
Sinatra
3D Digital Production for Animation & Video Games
Advanced 3D Digital Production
Sound & Music Design for Digital Media
Broadcast Journalism
The Business of Television
Sports & Television
Entertainment and Arts Law
Media Ethics
Media and the Presidency
The Digital Newsroom
Ireland On Screen
Culture of Italian Immigration
The West of Ireland
Girls Media & Cultural Studies
The Film Producer
Internet Television Production
Media Stardom and Celebrity Culture
Contemporary Hollywood
Media, History, and Memory
The Politics of Style: 1980s Film & TV Culture
Cold War Media Culture
Gender and Rock
Media & Identity
Makin’ Em Move
TV as a Storytelling Medium
The Telly in Transition: British TV Today
Media Industries
Transmedia Storytelling
Interactive Storytelling
Germany in Postwar Cinema
Women and Media Culture
Cinemasculinities
The Movie Musical
The Child in Cinema
The Apartment Plot
Queer Media Studies
New Trends in European Non-Fiction Film

THEATRE ELECTIVES
Introduction to Theatre
Latin American Theatre
History of Costume
Shakespeare on the Big Screen
Scene Design
Lighting Design
Costume Design
Shadow Puppetry
Spectacular Asia
Performing Blackness
Musical Theatre History
Creating the Musical
Stage Combat
Devised Performance
Documentary Theatre
Acting: Process
Viewpoints for Actors and Directors
Voice and Movement
Stage Management
Playwriting
Story Structure
Make-up for the Stage
Scenic Painting
Draping and Flat Pattern
Acting: Character
Acting: Text and Technique
Directing: Process
CAD for the Stage
Advanced Technical Production
Broadway Theatre Experience

MUSICAL THEATRE
This interdisciplinary minor is meant to engage the student who has multiple interests in Musical Theatre. Some students will structure their program around singing and acting, but others around songwriting, or work as conductor/impresario, or stage directing, or scholarship, etc. Admission to introductory classes will not be based on performance ability.

5 courses (15 credit hours):
3 credits - Musical Theatre History
3 credits of course work in FTT courses
3 credits of course work in MUSIC
3 credits from either FTT or MUSIC, with the Musical Theatre Minor Designation
3 credits for a CAPSTONE PROJECT

Current Department of Film, Television, and Theatre courses for the Musical Theatre minor:
Musical Theatre History (required)
Musical Theatre Movement/Dance Performance Techniques
Production and Performance
The Movie Musical
Disney in Film and Culture
Musical Theatre Lab

Current Department of Music courses for the Musical Theatre minor:
American Popular Song
Voice Lessons for Non-Majors
Theory for Non-Majors
Intro. To Harmony and Voice Leading
Musicianship I
Musicianship II
Musicianship III
Conducting I
Opera in Production
Opera Workshop
Vocal Pedagogy
Voice Science

Complementary Nature of Departmental Concentrations. There is a strong creative and scholarly relationship in the mix of courses and activities of the department of which students should be aware. The concentrations offered by this department can provide many complementary areas of creative and technical study for students involved in film and television production, as well as overlapping historical, theoretical and critical concerns. Similarly, those concentrating in theatre are urged to avail themselves of the many opportunities for production experience and critical, cultural and theoretical studies offered by the theatre faculty.

Co-curricular Activities. The department encourages non-majors to elect courses, participate as audience in our extensive film and theatre series, and involve themselves in film, television, and theatre production as a means of informing and complementing their liberal arts education at Notre Dame. Occasional guest artists and lecturers are also sponsored by...
the department. Information on all department-sponsored activities is available in the department office and on the department’s website.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Film, Television, and Theatre. Course descriptions can be found by clicking on the subject code and course number in the search results.

Gender Studies

Director:
Mary Celeste Kearney

Associate Director:
Pamela Wynne Butler

Program Coordinator:
Linnie Caye

Postdoctoral Fellow:
LaDonna Forsgren

Internal Scholar-In Residence:
Michael Rea, Professor, Department of Philosophy

Concurrent Faculty:
Gail Bederman, Associate Professor, Department of History; Ashley Bohrer, Assistant Professor of Gender and Peace Studies, Keough School of Global Affairs; Eileen Hunt Botting, Professor, Department of Political Science; Kasey Buckles, Associate Professor, Department of Economics; Pamela Wynne Butler, Assistant Teaching Professor, Gender Studies Program; Meredith Chesson, Associate Professor, Department of Anthropology; Kathleen Cummins, Associate Professor, Department of American Studies; La Donna Forsgren, Associate Professor, Department of Film, Television, and Theatre; Karen Graubart, Associate Professor, Department of History; Barbara Green, Professor, Department of English; Perin Gurel, Associate Professor, Department of American Studies; Susan Harris, Professor, Department of English; Cyraina Johnson-Roullier, Associate Professor, Department of English; Mary Celeste Kearney, Associate Professor, Department of Film, Television and Theatre; Janet Kourany, Associate Professor, Department of Philosophy; Julia Kowalski, Assistant Professor, Keough School of Global Affairs; Sarah McKibben, Associate Professor, Department of Irish Language and Literature; Melissa Miller, Assistant Teaching Professor, Department of German and Russian Languages and Literature; Abigail Oxbobck, Assistant Professor, Department of Sociology; Paul Oxbobck, Associate Professor, Department of History; Emily Remus, Assistant Professor, Department of History; Alison Rice, Associate Professor of French, Department of Romance Languages and Literatures; Francisco Robles, Assistant Professor, Department of English; Jason Ruiz, Associate Professor, Department of American Studies; Sonja Stojanovic, Assistant Professor, Department of Romance Languages and Literatures; Sophie White, Professor, Department of American Studies; Pamela Wojcik, Professor, Department of Film, Television and Theatre; Nicole Woods, Assistant Professor, Department of Art, Art History and Design

Gender Studies Major, Supplementary Major and Minor

Objectives. Gender Studies is an interdisciplinary academic program in the College of Arts and Letters at Notre Dame. Gender Studies analyzes the significance of gender—and the cognate subjects of sex, sexuality, race, ethnicity, class, religion, and nationality—in all areas of human life, especially in the social formation of human identities, practices, and institutions. Gender Studies gives scholars the methodological and theoretical tools to analyze gender and its cognates in their chosen disciplines in the arts, humanities, social sciences, and natural sciences. Gender Studies also provides its students and alumni with an intellectual framework in which the analysis of gender and its cognates can be creatively and critically applied to their personal, familial, professional, and civic roles. In the context of the Catholic identity of Notre Dame, Gender Studies facilitates the study of the intersection of gender and religion in the shaping of ethics, culture, and politics. Alongside our diverse array of courses drawn from across the University, our summer internship and academic-credit internship programs emphasize the holistic and practical life applications of a Gender Studies education at Notre Dame.

Gender Studies offers students a major, a supplementary major and a minor. In the major and supplementary major, students choose a concentration in Arts and Culture, Religion and Family, or Gender and Society. These concentrations allow students to focus their study of gender to prepare them for their senior capstone project.

Requirements for Primary Major:
10 courses, 30 credit hours

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

4 courses in one of the following concentrations:
- Arts and Culture
- Religion and Family
- Gender and Society

2–3 electives

1 senior capstone project:
- regular track: Interdisciplinary Seminar thesis track: senior thesis (6 credits—must be in student’s area of concentration)

Requirements for Supplementary Major:
8 Courses, 24 credit hours

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

3 courses in one of the following concentrations:
- Arts and Culture
- Religion and Family
- Gender and Society

2 electives

To Table of Contents
German and Russian Languages and Literatures

Chair:
- David Gasperetti

Rev. Edmund P. Joyce, C.S.C., Professor of German Language and Literature:
- Mark W. Roche

Paul G. Kimball Professor of Arts and Letters:
- Vittorio Hösle

John J. Gavenaugh, C.S.C., Professor of Humanities:
- William C. Donahue

Professors:
- William C. Donahue; Vittorio Hösle; Randolph J. Klawiter (emeritus); Klaus Lanzinger (emeritus);
- Thomas G. Marullo; Robert E. Norton; Vera B. Profot (emerita); Mark W. Roche; Konrad Schaum (emeritus)

Associate Professors:
- Tobias Boes; David W. Gasperetti; Claire Taylor Jones; Albert K. Wimmer (emeritus)

Assistant Professor:
- Emily Wang

Teaching Professors:
- Denise M. Della Rossa; Hannelore Weber (emerita)

Associate Teaching Professor:
- Judith Benz

Assistant Teaching Professor:
- Melissa Miller

Program of Studies. The study of German and Russian languages and literatures provides educational opportunities relevant to an increasingly interdependent world. The acquisition of foreign language skills in general is an important component of liberal education because it enhances students’ powers of communication and serves to introduce them to enduring cultural achievements of other peoples. In this sense, the study of German and Russian widens students’ intellectual horizons, stimulates the understanding of several significant cultural traditions, and facilitates the examination of these traditions in a more sophisticated and cosmopolitan manner.

The goal of all levels of language courses are oral and reading competence and linguistic and stylistic mastery. Courses in advanced German or Russian language, literature, culture and civilization expose the student to a wealth of literary, cultural and humanistic traditions as well as foster a better understanding of the rich national cultures of the German- and Russian-speaking countries.

The Department. The Department of German and Russian Languages and Literatures offers instruction in German and Russian at all levels of competence, from beginning language courses at the 10000 level to literature and civilization courses on the 30000 and 40000 levels.

Requirements for Interdisciplinary Minor:
5 courses, 15 credit hours

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

3 electives

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Gender Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

German and Russian Requirements: Successful completion of 6 courses (18 credit hours) beyond the three-semester language sequence.

THE GERMAN PROGRAM
Director of Undergraduate Studies:
Denise M. Della Rossa

REQUIREMENTS: FIRST MAJOR, SUPPLEMENTARY MAJOR, AND MINOR

Major in German Language and Literature
Successful completion of 10 courses (30 credit hours) beyond the three-semester language sequence.

These 10 courses must include successful completion of 20202, 30304, and 30305 and an additional 7 electives. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 10 courses, 4 must be upper-division courses at the home institution from departmental offerings; 2 must be at the 40000 level; and 2 may be in English.

Supplementary Major in German Language and Literature
Successful completion of 8 courses (24 credit hours) beyond the three-semester language sequence.

These 8 courses must include successful completion of 20202, 30304, and 30305 and an additional 5 electives. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 8 courses, 3 must be upper-division courses at the home institution from departmental offerings; 1 must be at the 40000 level; and 2 may be in English.

Major in International Economics in German
The undergraduate major in International Economics is a collaborative effort between the Department of Economics and affiliated departments of languages and literature. In pursuing this major, students take a minimum of eight economics courses and six courses in German beyond the language requirement. Students are also required to enroll in a one-credit “Exploring International Economics” course, preferably their sophomore year, designed to foster the integration of the study of culture with the study of economics. Under the guidance of a faculty mentor, international economics majors in German integrate their economic and language and culture study into a senior research project or senior thesis. This project or thesis is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of German studies.

German Requirements: Successful completion of 6 courses (18 credit hours) beyond the three-semester language sequence. All students are required to take GE 33000: Exploring International Economics (one credit), preferably taken during the sophomore year.
These 6 courses must include successful completion of 20202, 20113, 30304 and 30305 and an additional 2 electives; one of which must be at the 40000 level; one of which may be taught in English. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 6 courses, 2 must be upper-division courses at the home institution from departmental offerings. Refer to the Department of Economics for the relevant course requirements in economics which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10011/20011; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; ECON 48100; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

Minor in German Language and Literature
Successful completion of 5 courses (15 credit hours) beyond the three-semester language sequence.

These 5 courses must include successful completion of 20202, 30304, and 30305 and an additional 2 electives. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 5 courses, 2 must be upper-division courses at the home institution from departmental offerings; and 1 may be in English.

Major in German Studies
Successful completion of 10 courses (30 credit hours) beyond the three-semester language sequence.

These 10 courses must include successful completion of 20202, 30304, and 30305 and an additional 7 electives. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 10 courses, 4 must be upper-division courses at the home institution; 3 must be in German and up to 4 may be in English; 2 must be at the 40000 level.

Supplementary Major in German Studies
Successful completion of 8 courses (24 credit hours) beyond the three-semester language requirement.

These 8 courses must include successful completion of 20202, 30304, and 30305 and an additional 5 electives. 20202 is a prerequisite to 30304 and 30305, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 8 courses, 3 must be upper-division courses at the home institution; 2 must be in German and up to 3 may be in English; 1 must be at the 40000 level.

Study Abroad: Students who participate in a study abroad program during the academic year must take at least 1 course from departmental offerings after their return to the home campus. Only one intensive language course taken abroad, whether completed during a summer program or the academic year, will count as an elective toward the first major, supplementary major, or minor.

Senior Thesis and Departmental Honors
German first or secondary majors who elect to write a Senior Thesis must meet the following requirements:
1. The student must have a GPA of 3.0 or higher in the major.
2. Should be nominated by two members of the German faculty during the spring semester of his or her junior year and no later than the first week of classes fall semester of the senior year, and
3. The thesis may be written in either German or English with a length of between 25–35 pages, including notes and references. (Exceptions beyond 35 pages require advisor approval.) Two bound copies of the final document are to be submitted to the Department of German.

For the fall semester the student will receive a satisfactory/unsatisfactory grade (3 credits) for GE 48499. At the completion of the thesis in the spring semester, the student will be given a letter grade (3 credits) for GE 48498. These credits do not count toward the 30-credit hour requirement for the first major or the 24-credit hour requirement for the second major.

German first majors who wish to receive Departmental Honors must meet the above criteria as well as the following:
1. The student will present their thesis work in a public forum, such as a departmental colloquium or an undergraduate conference, and
2. The student must maintain a departmental GPA of 3.5 and receive no lower than a B+ on the Senior Thesis.

THE RUSSIAN PROGRAM
Director of Undergraduate Studies: Melissa Miller

The Major in Russian
Majors in Russian must complete ten courses (thirty credit hours) at the 20000 level and above, including at least six courses taught by departmental faculty. Intermediate Russian I and II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in Russia are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take four three-credit literature or culture courses offered by the department at the 30000 level or above, including at least one course each at the 30000 and 40000 levels. With the permission of the Director of Undergraduate Studies, one course on a Russian subject taught in another department, such as Anthropology, History, Political Science, or Theology, may be counted toward the Russian major.

The Supplementary Major in Russian
Supplementary majors in Russian must complete eight courses (twenty-four credit hours) at the 20000 level and above, including at least four courses taught by departmental faculty. Intermediate Russian I and II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in Russia are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take two three-credit literature or culture courses offered by the department, one at the 30000 level and one at the 40000 level. With the permission of the Director of Undergraduate Studies, one course on a Russian subject taught in another department, such as Anthropology, History, Political Science, or Theology, may be counted toward the Russian supplementary major.

The Major in International Economics in Russian
Combining the study of economics with the knowledge of another country's language and culture can be a powerful advantage in business. The Major in International Economics in Russian is designed to provide this edge by preparing students for the challenges of an ever more interconnected global economy. The requirements for the major include the following: RU 33000 "Exploring International Economics" (one credit, must be taken in the sophomore year), which fosters an integrated approach to the study of culture and economics; seven courses (21 credits) from Russian departmental offerings at the 20000 level and above, including RU 20101: Intermediate Russian I, RU 20102: Intermediate Russian II, RU 40101: Advanced Russian I, RU 40102: Advanced Russian II, one literature/culture elective each at the 30000 and 40000 levels, and one additional three-credit literature or Russian history elective at the 30000 or 40000 level. These courses must be taken in residence in the department. However, participants in an approved semester-long program in Russia are automatically exempted from the language course that is offered concurrently with their semester abroad. Students also take eight courses in economics. In addition, all international economics majors combine their study of economics and language, literature, and culture in a senior research project or senior thesis written under the guidance of a faculty mentor.

Refer to the Department of Economics for the relevant course requirements in economics, which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10011/20011; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; ECON 48100; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.
The Minor in Russian
The Russian minor consists of five courses (fifteen credits) at the 20000 level or above taught by departmental faculty. Course selection must include at least two language courses at the student’s appropriate level and three additional three-credit courses at either the 30000 or the 40000 level.

The Minor in Russian Studies
The Minor in Russian Studies allows students interested in Russian, East European, and Eurasian culture an opportunity to develop cultural competency in the region without a focus on language study. It consists of sixteen credits: a one-credit introductory course and five three-credit courses at the 30000 level or above, three of which will be taught by faculty in the Department of German and Russian. In order to expose students to diverse analytical approaches and a richer variety of cultural data, they are encouraged to take courses that engage with literature, history, and political science. Students may apply courses taken away from Notre Dame towards this minor with the approval of the Directory of Undergraduate Studies.

Study Abroad
Our students are encouraged to experience firsthand the excitement of being immersed in Russian culture through participation in a study program in Russia. Programs are available during the summer (five to nine weeks) or for an entire semester or academic year. Credits earned for course work taken in an approved program may be applied toward a Russian major or minor at Notre Dame. Grants are available on a competitive basis for summer language study through the Center for the Study of Languages and Cultures and the Nanovic Institute for European Studies.

Senior Thesis/Honors Track
Russian majors are admitted into the honors track by application. To receive honors, a student must (1) complete all requirements for the major; (2) maintain a GPA of at least 3.5 in the major; (3) register for two 1-credit enrichment courses (RU 47100) in the senior year; (4) register for two 40000-level literature courses in the senior year; and (5) receive a grade of A- or higher for a substantial honors thesis written in English. Closely supervised by one of the Russian faculty in the Department of German and Russian Languages and Literatures, the Russian honors thesis is to be the product of a 6-credit honors track directed readings course taken in the senior year. The student will receive 3 credits in the fall semester for preparation of the thesis and 3 credits in the spring semester for writing the thesis. For more information, see germanandrussian.nd.edu.

Placement and Language Requirement
At the beginning of each semester, placement tests in German and Russian will be administered that will allow students to enroll in a course commensurate with their language proficiency. The placement test is mandatory for students who had German or Russian in high school.

Students testing out of four semesters must complete an additional course at the 20000 level or higher before fulfilling the language requirement. This includes students who have taken an AP or SAT II exam.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes in German or Russian for a given semester may be found by clicking on “Class Search” and selecting either German or Russian from the Subject menu. Course descriptions can be found by clicking on the subject code and course number in the search results.

History
Chair:
Elisabeth Köll
Director of Undergraduate Studies:
James (Jake) Lundberg
Director of Graduate Studies:
Darren Dochuk
Francis A. McAnaney Professor of History:
John T. McGreevy
Andrew W. Tocque Professor of History:
John H. Van Engen
Madden-Hennebey Professor of Irish American History:
Patrick Griffin
Dorothy S. Griffin Professor of History:
Brad Gregory
Marilyn Keough Dean of the Donald R. Keough School of Global Affairs:
R. Scott Appleby
Professors:
R. Scott Appleby; Ted Beaty; Alexander Belhammer; Tom Burman; Jon Coleman; Felipe Fernández-Armesto; Brad Gregory; Patrick Griffin; Christopher S. Hamlin; Asher Kaufman; Semion Lyandres; Alexander Martin; John T. McGreevy; Rev. Wilson D. Miscamble, C.S.C.; Rev. Robert Sullivan; Tom Tweed
Professors Emeritus:
Rev. Thomas Blantz, C.S.C.; Jay P. Dolan; J. Philip Gleason; Rev. Robert L. Kerby; Thomas A. Kielman; George Marsden; Dian H. Murray; Thomas Noble; Mark Noll; Walter Nugent; Rev. Marvin R. O’Connell; James Turner; John H. Van Engen; Andrzej Walicki
Associate Professors:
Gail Bederman; Mariana Candido; Kathleen Cummings; John Deak; Darren Dochuk; Karen Graubart; Daniel Hobbins; Elisabeth Köll; Margaret Meserve; Paul Ocebock; Jaime Pensado; Richard Pierce; Linda Przybyszewski; Rory Rapple; Julia Adeney Thomas; Deborah Tor
Assistant Professors:
Liang Cai; Karyl Carter; Katie Jarvis; Rebecca McKenna; Evan Ragland; Emily Remus; Sarah Shortall; Joshua Specht
Professor of the Practice:
Daniel A. Graff
Assistant Professor of the Practice:
James (Jake) Lundberg
Concurrent Faculty:
Christopher Baron (Classics); Jessica Baron (Political Science); Francesca Bordogna (Program of Liberal Studies); Steven Brady (First Year of Studies); Annie Gilbert Coleman (American Studies); Kathleen Sprows Cummings (American Studies and Cushwa Center); Barry Cushman (Law School); Erika Doss (American Studies); Melinda Gormley (John J. Reilly Center); Robert Goulding (Program of Liberal Studies); Lionel Jensen (East Asian Languages & Cultures); Robert (Jay) Malone (History of Science Society); John Soares; Thomas A. Stapleford (History and Philosophy of Science); Kevin
The Department of History offers undergraduate courses that span global regions from the ancient world to the present. Courses are both regional and thematic in approach and designed to emphasize global connections across space. Both smaller seminars and larger lecture-style courses require students to develop critical skills reading primary and secondary sources, and in historical thinking and writing.

The Major in History. For students interested in pursuing a History major, the department offers a rigorous program of ten 3-credit courses. The sequence begins for all standard majors with an exciting introductory seminar (HIST 33000–History Workshop), which introduces students to the work of writing history through a series primary source-based case studies. To encourage breadth of historical knowledge, majors also take a variety of courses in different chronological periods and global regions.

Students graduating in the class of 2022 or earlier must take one course from four of six fields: Africa/Asia/Middle East; Pre-Modern Europe (to 1500); Modern Europe (from 1500); United States; Latin America; Special/Thematic. To encourage depth in a particular field of interest, standard majors also declare a concentration consisting of three courses (concentrations must be approved by the Director of Undergraduate Studies by the beginning of the senior year). Standard majors also take one additional elective in any field they choose.

Beginning with the class of 2023, standard majors will take four breadth courses: one global course, and three courses from five regions: Africa and the Middle East, Asia, Europe, Latin America, North America. To encourage depth, standard majors will select a three-course concentration in one of five regional categories (Africa and the Middle East, Asia, Europe, Latin America, North America), or a thematic cluster (Global Empires, Business and Economics, Religion). Majors may also petition the Director of Undergraduate Studies to define their own thematic cluster. Standard majors will also take one additional free elective in any field they choose. All majors must declare their concentration by the end of the junior year.

To complete their coursework, all standard majors, regardless of class year, must take a departmental seminar (HIST 43xxx). This writing-intensive course prioritizes research in primary sources toward the production of a substantial paper. The departmental seminar also emphasizes writing as a process, encouraging students to perform continual revisions and share their writing with peers.

All standard majors must also take at least one course in pre-modern (pre-1500) history.

Application of AP Credits to the Major in History. Beginning with the class of 2022, students who received a score of 5 on an AP history subject test (US, European, or World) may apply 3 credits toward the major in history. No more than 3 AP credits may be applied to the major.

The Minor in History. The minor in history is designed to offer a formal program and pedagogical structure to those students who have an interest in history, but do not have room to be full majors. The program is designed to be flexible while offering students an introduction to the discipline of history.

The minor in history consists of five 3-credit hour courses with no prerequisites: History Workshop (HIST 33000) and four general electives, one of which must include a research component (with no more than one course taken abroad, and no more than one taken at the 10000 level, including history university seminars).

The Minor in Economic and Business History. This more targeted minor program introduces students to the intertwined histories of economics, business, finance, capitalism, labor, and political economy. It is designed for students entering professional careers that require a deep understanding of the economic, political, and historical complexities of the global age. The minor consists of five 3-credit hour courses with no prerequisites. Students take four general electives from a roster of courses approved by the Department of History. In addition, students will have to take the new capstone course “Economy and Business in History” which allows them to synthesize and apply the methodologies and approaches of the discipline to their writing assignments, including a required research paper as a final assignment.

History Honors Program. The History Department offers a special program of study, the History Honors Program, for the most talented and motivated history majors. Students are invited to apply in the fall semester of the junior year; the program begins in the spring of the junior year. A student in the History Honors Program will take 11 three-credit history courses to satisfy both the Honors Program and standard history major requirements. In addition to taking the introductory gateway course (HIST 33000, History Workshop) and a variety of courses emphasizing geographical and chronological breadth, the student will also take two special honors seminars. Instead of completing a departmental seminar, the student will research and write a yearlong senior thesis, receiving three credits in each semester of the senior year. Each history honors student will select an area of concentration tailored to his or her thesis topic and will take two additional courses in this field to complete the program.

In the spring of the junior year, the student will enroll in an Honors Program Methodology Seminar (HIST 53001), designed to introduce the student to the various methods historians utilize to analyze and write about the past. [Students admitted to the Honors Program, but studying abroad during the spring semester junior year, will be exempt from HIST 53001. They must, however, register a thesis topic and advisor with the director of Undergraduate Studies by the end of that semester.]

In the fall of the senior year, the student will enroll in the Honors Program Historiography Colloquium (HIST 53002), intended to introduce the student to basic issues of critical interpretation and historiography through a specific field. In the fall and spring of the senior year, the student will work on a thesis (40 to 80 pages) under the supervision of a specific faculty member. The student will register for HIST 58003 (three senior thesis credits) in the fall and HIST 58004 (three senior thesis credits) in the spring of the senior year.

Phi Theta Alpha. Students who have completed at least four major courses in history, earning a grade point average of 3.8 or above are eligible for the Notre Dame chapter of Phi Alpha Theta, a national history honor society. The History Department initiates new members once per year in the spring.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject History. Course descriptions can be found by clicking on the subject code and course number in the search results.
Irish Language and Literature

Chair:
Peter McQuillan

The only one of its kind in North America, the Department of Irish Language and Literature began offering a major and a supplemental major in Irish Language and Literature in the fall 2012 semester. The department also gives undergraduates the opportunity to complete a minor in the field.

These programs teach students Irish, the indigenous language of Ireland and the voice of the oldest vernacular literature in Europe. It also allows them to engage Irish culture in its native language.

Officially launched on October 1, 2004, by H.E. Excellency Noel Fahey, Irish Ambassador to the United States of America, the Department of Irish Language and Literature recognizes Notre Dame’s commitment to the Irish language and the centrality of Irish to the academic discipline of Irish Studies.

Requirements for a Major in Irish Language and Literature (with a language-intensive concentration) In addition to Intermediate Irish I, a student must take
• Intermediate Irish II
• Advanced Irish I & II
• 2 survey courses—covering medieval to 18th-century, and 19th- to 21st-century literature, respectively
• 4 electives—3 of which must be taken at a 30000/40000 level
• 1 elective taken at a 40000 level and taught in the Irish language

Supplemental Major (with a language-intensive concentration) Requirements are the same as those for the major except only 2 elective courses, 1 of which must be taken at the 30000/40000 level, are required.

Requirements for a Major in Irish Language and Literature (with a literature-intensive concentration) In addition to Intermediate Irish I, a student must take
• Intermediate Irish II
• 2 survey courses—covering medieval to 18th-century, and 19th- to 21st-century literature, respectively
• 7 electives—6 of which must be taken at a 30000/40000 level

Supplemental Major (with a literature-intensive concentration) Requirements same as those for the major except only 5 elective courses, of which 4 must be at the 30000/40000 level, are required.

Senior Thesis and Honors Guidelines
Students with a passion for Irish language and literature may choose to write a senior thesis or a senior honors thesis to crown their studies at Notre Dame. Students should identify a topic in spring of junior year in consultation with a faculty advisor, and then arrange to take a two-course sequence of directed readings with their advisor, doing research and reading in fall and writing the thesis in early spring.

Students pursuing a Minor in Irish Language and Literature are required to complete the following courses:
1. Take and pass the following Irish language courses:
   Beginning Irish I & II, Intermediate Irish and Intermediate Irish II.
2. Take and pass three Irish literature courses offered by the Department of Irish Language and Literature, two of which must be a 30000 level or above.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Irish Language and Literature. Course descriptions can be found by clicking on the subject code and course number in the search results.

Mathematics

Chair:
Richard Hind

Associate Chair:
Matthew J. Dyet

Director of Graduate Studies:
Samuel R. Evens

Director of Undergraduate Studies:
Sonja Mapes-Székelyhidi

William F. Hank Family Professor of Mathematics:
Anand Pillay

Charles L. Huisking Professor of Mathematics:
Julia E. Knight

John and Margaret McAndrews Professor of Mathematics:
Mark Behrens

John A. Zahn, C.S.C., Professor of Mathematics
Stephen A. Stolz

Glynn Family Honors Collegiate Professor:
Claudia Polini

Notre Dame Professor of Mathematics:
Gabor Székelyhidi

Notre Dame Professor of Topology:
Andrew Putnam

Professors:
Peter A. Cholak; Francis X. Connolly (emeritus); Jeffrey A. Diller; William G. Dwyer (emeritus); Matthew J. Dyer; Samuel R. Evens; Leonid Faybusovich; David Galvin; Michael Gekhtman; Karsten Grove (emeritus); Matthew Gursky; Alexander J. Hahn (emeritus); Brian C. Hall; Qing Han; Alex A. Himonas; Richard Hind; Alan Howard (emeritus); Francois Ledrappier (emeritus); Juan Migliore; Gerard K. Misiułek; Liviu Nicolaescu; Richard R. Otter (emeritus); Barth Pollak (emeritus); Mei-Chi Shaw; Roxanne Smarandache; Brian Smyth (emeritus); Dennis M. Snow; Nancy K. Stanton (emeritus); Sergei Starchenko; Laurence R. Taylor; Warren J. Wong (emeritus); Frederico Xavier (emeritus)

Associate Professors:
Kathina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Claudi Raicu

Assistant Professors:
Nicholas Edelen; Felix Janda; Alexandra Kjuchkova; Pavel Mnev; Juanita Pinzon Caicedo; Marco Radeschi; Christopher Schommer-Pries; Alexander Shapiro

Professors of the Practice:
Arthur Lim; Annette Pilkington

Associate Professors of the Practice:
Andrei Jorza; Sonja Mapes-Székelyhidi

Program of Studies: Students in the College of Arts and Letters may pursue a major in mathematics with a concentration in honors. (Note that this program should not be confused with the Arts and Letters/Science Honors program and that several concentrations, including Honors, are available with a major in mathematics in the College of Science.) The mathematics major in arts and letters aims to give the student a thorough liberal intellectual discipline and to furnish an adequate background for
other fields of study. At the same time it prepares the student for graduate work in mathematics, and many of those who have taken the program have entered graduate schools in that field. Others have entered philosophy, medicine, law, economics and industrial management.

Students intending to follow this major in the College of Arts and Letters must declare their intention to the advisor indicated by the mathematics department and the dean of arts and letters at advance registration in the spring of their freshman year. Students must have completed or be completing satisfactory work in MATH 10850 and 10860. The program of their studies is subject in its entirety to approval by the advisor.

Students whose first major is in the College of Arts and Letters may also pursue a second major in mathematics. See “Mathematics as a Second Major” in the College of Science section of this Bulletin.

THE PROGRAM OF COURSES

First Year

First Semester

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<td>University Requirement</td>
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<td>MATH 10850. Honors Calculus I</td>
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<td>Natural Science</td>
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Second Semester

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<td>MATH 10860. Honors Calculus II</td>
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<td>Natural Science</td>
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Sophomore Year

First Semester

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<td>University Requirement</td>
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<td>MATH 20810. Honors Algebra I</td>
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Second Semester

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<td>MATH 20820. Honors Algebra II</td>
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<td>MATH 20860. Honors Calculus IV</td>
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Junior Year

First Semester

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<td>MATH 30810. Honors Algebra III</td>
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Second Semester

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Senior Year

First Semester

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Second Semester

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<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics Electives</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
</tr>
</tbody>
</table>

(At least six credits of mathematics electives must be at the 40xxx level.)

The Senior Thesis for Mathematics Majors

Students in the mathematics program have the option of writing a thesis on a subject in mathematics, or in an interdisciplinary area connected to mathematics. Such a thesis is strongly encouraged for math honors students and required of students in the SUMR program. This project is intended to give the student a better sense of how mathematics is done and used, and to develop in the student the habit of learning mathematics and its applications in an independent setting. In most cases, this work would be expected to be expository, but based on advanced-level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject, or to explore one of the many interesting connections that mathematics has with other disciplines.

During the second semester of the junior year and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis, receiving 2 credits for each of these two semesters of work, under MATH 48800.

The thesis is to be crafted during the second semester of the senior year. The thesis must be submitted to the director of undergraduate studies by April 15 of the senior year. If the thesis is approved, the student will receive 2 credits under MATH 48900 and the citation of “Graduation with Senior Thesis” will appear on the transcript.

Students interested in writing a senior thesis should contact the director of undergraduate studies in the Department of Mathematics.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Mathematics. Course descriptions can be found by clicking on the subject code and course number in the search results.
Medieval Studies

Robert M. Conway Director of the Medieval Institute: Thomas Burman (History)
Director of Undergraduate Studies: Christopher Miller
Fellows of the Medieval Institute:
Hussein Abdulalater (Classics: Arabic)
Christopher Abram (English)
Khaled Anatolios (Theology)
Ann Astell (Theology)
Rev. Yury Avvakumov (Theology)
Zygmunt G. Baranski (Romance Languages: Italian)
Alexander Beihammer (History)
Alexander Blachly (Music)
W. Martin Bloomer (Classics: Latin)
Adam Bremer-McCollum (Theology)
Katie Buggyis (Liberal Studies)
Thomas Burman (History)
Theodore J. Cachey (Romance Languages: Italian)
Peter Casarella (Theology)
John C. Cavadini (Theology)
Theresa Cory (Philosophy)
Richard Cross (Philosophy)
Rev. Brian E. Dalye, S.J. (Theology)
JoAnn DellaNeva (Romance Languages: French)
Tarek Dika (Liberal Studies)
Stephen D. Dumont (Philosophy)
Margot Fassler (Music, Theology)
Felipe Fernández-Armesto (History)
Leonardo Francalanci (Romance Languages: Catalan, Spanish)
Nina Gilbetic (Theology)
Robert Goulding (History and Philosophy of Science)
Karen Graubart (History)
Brad S. Gregory (History)
Li Guo (Classics: Arabic)
David Gura (Hesburgh Libraries)
Marius Hauknes (Art History)
Daniel Hobbins (History)
Peter Holland (Theater)
Peter Jeffery (Music)
Robin Jensen (Theology)
Claire Taylor Jones (German)
Louis Jordan (Hesburgh Libraries)
Encarnación Juárez-Almendros (Romance Languages: Spanish, emerita)
Michelle Karnes (English)
Mary M. Keys (Political Science)
Brian Krostenko (Classics: Latin)
Ian Kuitj (Anthropology)
Blake Leyerle (Theology)
David Lincicum (Theology)
Tim Machan (English)
Linda Major (Medieval Studies)
Julia Marvin (Liberal Studies)
Peter McQuillon (Irish Language and Literature)
Margaret Meserve (History)
Christopher Miller (Medieval Studies)
Christian R. Meev (Romance Languages: Italian)
Hildegund Müller (Classics: Latin)
Amy Mulligan (Irish Language and Literature)
David O’Connor (Philosophy)
Classics: Jean Porter (Theology)
Andrew Radde-Gallwitz (Liberal Studies, Theology)
Garfield Radle (Theology)
Rory Rappe (History)
Gretchen Reydams-Schils (Liberal Studies, Philosophy)
Garfield Said Reynolds (Theology)
Denis Robichaud (Liberal Studies)
Julia Schneider (Hesburgh Libraries)
Susan Guise Sheridan (Anthropology)
Deborah Tor (History)
Alessio Torrance (Theology)
Joseph P. Wawrykow (Theology)

Medieval Institute Emeriti:
D’Arcy J. D. Boulton (Medieval Studies, emeritus)
Maureen B. McCann Boulton (Romance Languages: French, emerita)
Robert R. Coleman (Art History, emeritus)
Rev. Michael S. Dricoll (Theology, emeritus)
Kent Emery, Jr. (Liberal Studies, Philosophy, emeritus)
Alfred Freddoso (Philosophy, emeritus)
Stephen E. Gersh (Philosophy, emeritus)
Kathryn Kerby-Fulton (English, emerita)
Mark C. Piklinton (Theatre, emeritus)
Duyce Seidsenspiner-Núñez (Romance Languages: Spanish, emerita)
John Van Engen (History, emeritus)

Program of Studies. The Medieval Institute is one of Notre Dame’s oldest and most renowned centers of learning. Established in 1946, it was envisaged from the start to be a premier locus for the study of the European Middle Ages. Over the decades its scope has broadened to where it now includes Islamic, Jewish, Eastern, and Western Christian studies. The academic strength and stature of the institute are due not only to its faculty, students, and library, but also to its ongoing commitment to the original liberal arts ideal.

Medieval Studies prepares students to enter graduate school, law school, medical school, or various careers such as business, government, education, publishing, ministry, curatorship, and research. With an emphasis on close reading, precise textual analysis, careful writing, and vigorous discussion, the program is designed to foster critical thinking, oral and written communication skills, and a heightened appreciation for history, religion, and culture.

Far from being the “dark ages,” medieval civilization witnessed the dawn of many of today’s institutions including universities, hospitals, legal and economic systems, religious communities and doctrine, architecture, engineering, science, art, and literature. Contemporary society is indebted to the Middle Ages not only for its inheritance, but also for its relevance.

The Medieval Studies program offers four undergraduate tracks, each based on an interdisciplinary model. It draws courses from Anthropology, Art, Art History, and Design; Classics; English; German and Russian Languages and Literatures; History; Islamic Language and Literature; Music; Philosophy; Political Science; Romance Languages and Literatures; and Theology. From these 12 disciplines, students are encouraged to build a unique program of study, in consultation with a faculty advisor, around an area of concentration that captures an interest, prepares for a field, or contributes to an academic pursuit.

Students interested in Medieval Studies may elect one of the following four options:

1. Major in Medieval Studies
2. Honors Major in Medieval Studies
3. Supplementary Major in Medieval Studies
4. Minor in Medieval Studies

All three major tracks include two common components. Each student’s curriculum is built around a concentration chosen by the individual (from the 12 participating departments), in conjunction with a faculty advisor. The concentration requires a minimum of four interrelated courses reflecting an intellectual and curricular coherence. An advanced seminar (3 credits) is the second common element in each of the major tracks. Students in the seminar are expected to read widely and discuss vigorously a set of sources that present a particular issue from several points of view. In addition, they are also expected to write a substantial research paper. The goal of the seminar is to engage students in thinking critically and knowledgeably across the boundaries of traditional disciplines while maintaining a focus on a particular time, place, or issue.

The three major tracks and the minor track also have an introductory required course (3 credits), MI 20001, The World of the Middle Ages.

Following are brief outlines of the basic requirements for the three major tracks and the minor track. Further details can be obtained from the director of undergraduate studies in the Medieval Institute.

Medieval Studies Major (30 credits)

- The World of the Middle Ages course
- Four courses drawn from two or more departments representing a concentration
- Four electives in Medieval Studies drawn from at least two departments
- One advanced seminar (4xxxx- level or above) in Medieval Studies

Medieval Studies Honors Major (36 credits)

- Same requirements as major in Medieval Studies (see above)
- EXCEPT one intermediate Latin course and one advanced Latin course are required in lieu of two medieval electives
- PLUS an honors thesis for 6 credits

Medieval Studies Supp. Major (24 credits)

- The World of the Middle Ages course
- Four courses drawn from two or more departments representing a concentration
- Two or three electives in Medieval Studies
- Medieval Studies seminar (on a space-available basis and in conjunction with MI electives option)

Medieval Studies Minor (15 credits)

- The World of the Middle Ages course
- Three or four electives in Medieval Studies drawn from at least two departments
- Medieval Studies seminar (on a space-available basis and in conjunction with MI electives option)
COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Medieval Institute. Course descriptions can be found by clicking on the subject code and course number in the search results.

Music

Acting Chair:
Peter Jeffery
Keough-Hesburgh Professor of Music History and Liturgy:
Margot Fassler
Michael P. Grace Chair in Medieval Studies:
Peter Jeffery
J.W. Van Gorkom Professor of Music:
Susan L. Youens (emerita)

Professors:
Alexander Blachly; John Blacklow; Calvin M. Bower (emeritus); William Cerny (emeritus); Craig J. Cramer (emeritus); Kenneth W. Dye; Ethan T. Haimo (emeritus); Georgine Resick (emerita); Carmen Tellez

Associate Professors:
Karen L. Buranskas (emerita); Mary E. Frandsen; Paul G. Johnson (emeritus); Rev. Patrick Maloney, C.S.C. (emeritus); Carolyn R. Plummer (emerita)

Assistant Professors:
John Liberatore; Johanna Frymoyer

Associate Professors of the Practice:
Kiera Duffy; Lawrence H. Dwyer; Stephen Lancaster; Daniel Schlosberg; Daniel C. Stowe

Concurrent Faculty:
Christopher Chowrimootoo

Band Staff:
Justin McManus; Matthew Merten; Sam Sanchez

Program of Studies. The Department of Music offers students a variety of musical experiences in accordance with its two objectives: (1) to provide all students, regardless of their major, knowledge and training in music through introductory, historical and theoretical courses, through participation in large and small ensembles, and through applied instrumental or vocal study; and (2) to provide intensive curriculum and training for the student who chooses music as a major. Students majoring in music will choose a concentration in Theory and History or in Performance. Each concentration offers an honors option for students intending to pursue professional study in the field after graduation. These students should also continue to study at least one non-native language beyond the college’s language requirement. All the concentrations have requirements beyond the course work. These may include recitals, ensembles, juries, and so forth. Students considering these programs should contact the department as early as possible, preferably in the first year of study. This is especially important if study abroad is anticipated.

Advising. Each major will be assigned a faculty advisor who must be consulted in person to discuss the program of study before a student may register for classes.

Lessons. Music majors in the Performance concentration qualify for a 100 percent discount on weekly one-hour applied music lessons on their primary instrument. Students in the Theory and History concentration qualify for a 50 percent discount on lessons on a primary instrument. Applied music lessons are also available for non-majors for a fee. The fee is charged to the students’ accounts, and no refunds are made after the second lesson.

Interdisciplinary Minor in Musical Theatre. This is a 5-course 15-credit minor. For more information on this minor, please contact the Director of Undergraduate Studies in the Department of Film, Television and Theatre.

Interdisciplinary Minor in Liturgical Music. This 18-credit minor consists of three 3-credit courses in theology and two 3-credit courses in music, plus three credits of music lessons or approved ensembles, to be selected in consultation with the student’s music advisor. Contact the director of undergraduate studies in the Department of Theology.

Master of Sacred Music degree. The Master of Sacred Music (MSM) is a degree program situated in the Department of Theology at the University of Notre Dame with major participation from faculty in the Department of Music. For information, contact Janet Rudasics at (574) 631-5349.

Doctor of Musical Arts degree. The Doctor of Musical Arts (DMA) is a degree program situated in the College of Arts and Letters at the University of Notre Dame with major participation from faculty in the Departments of Music and Theology. For more information, contact Janet Rudasics at (574) 631-5349.

HISTORY/THEORY

The requirements for a 33-credit major with a concentration in theory and history are:

Class Credits
Harmony and Voice Leading (Theory I) 0
(Praetice course; 3 credits count as University elective)
Advanced Harmony and Voice Leading
(Theory II) 3
Chromatic Harmony (Theory III) 3
Twentieth-Century Music: Structure and Style (Theory/History IV) 3
Musicianship I–III 3
History I–III 9
Four 3-credit courses in composition, history and theory, 30xxx level and above 12

Music Total 33
Neuroscience and Behavior

To Table of Contents

Collegiate/University Requirements and Electives 87
Honors in Music (optional) 6

Performance

Students who wish to major in performance must have had a minimum of four years of instruction on their instrument prior to their enrollment at Notre Dame.

The requirements for a 42-credit major with a concentration in performance are:

<table>
<thead>
<tr>
<th>Class</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmony and Voice Leading (Theory I)</td>
<td>0</td>
</tr>
<tr>
<td>(Prerequisite course; 3 credits count as University elective)</td>
<td></td>
</tr>
<tr>
<td>Musicianship I (prerequisite course)</td>
<td>0</td>
</tr>
<tr>
<td>Advanced Harmony and Voice Leading (Theory II)</td>
<td>3</td>
</tr>
<tr>
<td>Chromatic Harmony (Theory III)</td>
<td>3</td>
</tr>
<tr>
<td>Twentieth-Century Music: Structure and Style (Theory/History IV)</td>
<td>3</td>
</tr>
<tr>
<td>History I–III</td>
<td>9</td>
</tr>
<tr>
<td>Two MUS 30xxx-level or above courses</td>
<td>6</td>
</tr>
<tr>
<td>in composition, music theory or history</td>
<td></td>
</tr>
<tr>
<td>that carry 3 credits each</td>
<td></td>
</tr>
<tr>
<td>Three additional elective credits in music</td>
<td>3</td>
</tr>
<tr>
<td>Advanced Performance Studio (1 credit per semester for the first year; 2 credits for the six semesters thereafter)</td>
<td>14</td>
</tr>
<tr>
<td>1 recital</td>
<td>1</td>
</tr>
<tr>
<td>Total Music</td>
<td>42</td>
</tr>
</tbody>
</table>

In order to remain in the performance program, students must be approved by faculty. In the spring semester of the freshman, sophomore, and junior years, all performance majors must participate in juries. Afterwards, the faculty will assess the level of their performance to determine if they are qualified to continue in the program. Students who demonstrate a high level of achievement in the sophomore juries will be candidates for the honors program.

Students in the performance concentration may take proficiency exams to pass out of one or more of the musicianship classes; however, if they do not pass the proficiencies, they must enroll in Musicianship I–III.

Performance concentrators must present a senior recital. (Honors majors must present an additional recital.) Participation in ensembles (e.g., chamber music class, large ensembles, chorale, opera, etc.) is required each semester. (No credit toward the major, but may be applied toward graduation as “activity” credits.) Students who have had previous music education may place out of Harmony and Voice Leading (Theory I), by examination.

Course Descriptions

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Music. Course descriptions can be found by clicking on the subject code and course number in the search results.

Director of Undergraduate Studies: Anré Venter

Program of Studies. Neuroscience is a relatively young, exciting, and fundamentally interdisciplinary field devoted to the scientific study of the nervous system. Neuroscience encompasses the study of problems from multiple disciplinary perspectives at different levels of analysis in human and non-human organisms. It includes, for example, the study of molecular mechanisms in individual neurons and the coordination of millions of neurons into neural systems. Problems range from investigation of the evolution of nervous systems in basal vertebrates to the application of neuroscience to education and law. Neuroscientists also seek to develop neurologically plausible models of human thinking, affect and behavior.

Neuroscience creates a context for scholarly conversation about the nature of mind, brain and behavior. It engages experts in collaboration across diverse fields, including biological sciences, chemistry, computer science, engineering, linguistics, mathematics, medicine, philosophy, physics and psychology. Reflecting the interdisciplinary nature of the major, the curriculum includes flexibility such that it can be customized to best prepare students for a variety of future careers. Students studying neuroscience will be prepared to pursue professional degree programs (medical, dental, veterinary, clinical psychology, or other health professions) and graduate programs in areas such as neuroscience, biological sciences or psychology.

The neuroscience and behavior major is an interdisciplinary program that includes both Bachelor of Science and Bachelor of Arts tracks. The requirements for the major are similar for both tracks, with a foundational requirement of an introductory neuroscience course with a laboratory in the spring of the sophomore year. The two tracks differ in how they satisfy college level requirements. Both required courses and electives that satisfy the major credit requirements are drawn primarily from the Departments of Biological Sciences and Psychology. Undergraduate research and approved electives in other departments are also encouraged. The following description covers the BA track only (see page 162 for description of the BS track).

Major Requirements. The general BA in Neuroscience and Behavior consists of a total of 67 credits comprising the following: 19 credits of prerequisite courses (a number of these fulfill university core requirements as well), 23 credits of Neuroscience and Behavior Core major courses, 4 credits of Foundational Science courses, 6 credits of Biological Science major elective courses, 6 credits of Psychology major elective courses, and 6 credits
Neuroscience and Behavior

of additional major elective courses. The specific requirements are as follows:

**Major Prerequisites: (all courses required)**
- Intro Psychology (Core 5 & CR 6) 3
- MATH 10350/10550 (Core 1) 4
- MATH 10360 or 10560 (Pre-Med only) 4
- BIOS 10171/11171: Big Questions & Lab 4
- Gen CHEM 10171/11171 (Core 2) 4
- Org CHEM 10172/11172 (Core 3) 4

**Core Major Requirements: (all courses required)**
- BIOS 10172/11174 4
- NSBH UC 1: Systems Neuro w/lab 4
- NSBH UC 2: Intro to Cog Neuro 3
- NSBH UC 3: Molecular Neuro 3
- PSY 30100 Psychology Statistics 4
- PSY 30160 Psychology Research Methods 4
- NSBH 20010: Perspectives on the NSBH Major 1

**Biological Science Elective Requirements:**
- (2 courses required)
  - BIOS 30301 Embryology 3
  - BIOS 30338 Advanced Neurobiology 3
  - BIOS 30344 Human Physiology 3
  - BIOS 30410 Cellular Neurobiology 3
  - BIOS 40202 Developmental Neuroscience 3
  - BIOS 40339 Human Gross Anatomy 3
  - CHEM 30331 Chem in Service of Community 3
  - CHEM/NSBH 40404 Neuropathology 3
  - BIOS 10172/11174 4
  - NSBH UC 1: Systems Neuro w/lab 4
  - NSBH UC 2: Intro to Cog Neuro 3
  - NSBH UC 3: Molecular Neuro 3
  - PSY 30100 Psychology Statistics 4
  - PSY 30160 Psychology Research Methods 4
  - NSBH 20010: Perspectives on the NSBH Major 1

**Psychology Elective Requirements:**
- (2 courses required)
  - PSY 30200 Developmental Psychology 3
  - PSY 30220 Adolescent Development 3
  - PSY 30310 Abnormal Psychology 3
  - PSY 30400 Cognitive Psychology 3
  - PSY 30430 Learning & Memory 3
  - PSY 30440 Sensation & Perception 3
  - PSY 33528 Cognitive Aging 3
  - PSY 40126 Intro to Quant Neuroscience 3
  - PSY 43230 Mental Health & Aging 3
  - PSY 43250 Cognitive Development 3
  - PSY 43251 Language Development 3
  - PSY 43308 Cognition & Emotion 3
  - PSY 43357 Food and the Brain 3
  - PSY 43360 Health Psychology 3
  - PSY 43562 The Sleeping Brain 3

**Additional Elective Requirements:**
- (3 courses required)
  - ANTH 20105 Human Ethology (10209) 3
  - ANTH 20201 Fund of Bio Anthropology 3
  - ANTH 30190 Infancy: History, Dev, Evo 3
  - ANTH 35110 Primates & Behavior 3
  - ANTH 40120 Evolution/Med Persp Fhood 3
  - ANTH 43310 Advanced Human Ethology 3
  - ACMS 4XXX Artificial Neural networks 3
  - ACMS 40740 Comp & Math Neuroscience 3
  - CHEM 30331 Chem in Service of Community 3
  - CHEM/NSBH 40404 Neuropathology 3
  - ANTH 30172/11174 4
  - NSBH UC 1: Systems Neuro w/lab 4
  - NSBH UC 2: Intro to Cog Neuro 3
  - NSBH UC 3: Molecular Neuro 3
  - PSY 30100 Psychology Statistics 4
  - PSY 30160 Psychology Research Methods 4
  - NSBH 20010: Perspectives on the NSBH Major 1

**Core Major Requirements: (all courses required)**
- BIOS 10172/11174 4
- NSBH UC 1: Systems Neuro w/lab 4
- NSBH UC 2: Intro to Cog Neuro 3
- NSBH UC 3: Molecular Neuro 3
- PSY 30100 Psychology Statistics 4
- PSY 30160 Psychology Research Methods 4
- NSBH 20010: Perspectives on the NSBH Major 1

**Biological Science Elective Requirements:**
- (2 courses required)
  - BIOS 30301 Embryology 3
  - BIOS 30338 Advanced Neurobiology 3
  - BIOS 30344 Human Physiology 3
  - BIOS 30410 Cellular Neurobiology 3
  - BIOS 40202 Developmental Neuroscience 3
  - BIOS 40339 Human Gross Anatomy 3
  - BIOS 40450/60565 Clinical Res in Rare/Dis 4
  - BIOS 60571 Topics in Physiology (li, Duffield) Var
  - BIOS 60572 Topics in Neuro: Neuroendocrinology Var
  - BIOS 60572 Topics in Neuro: Sex Diff in Brain/Beh Var

**Psychology Elective Requirements:**
- (2 courses required)
  - PSY 30200 Developmental Psychology 3
  - PSY 30220 Adolescent Development 3
  - PSY 30310 Abnormal Psychology 3
  - PSY 30400 Cognitive Psychology 3
  - PSY 30430 Learning & Memory 3
  - PSY 30440 Sensation & Perception 3
  - PSY 33528 Cognitive Aging 3
  - PSY 40126 Intro to Quant Neuroscience 3
  - PSY 43230 Mental Health & Aging 3
  - PSY 43250 Cognitive Development 3
  - PSY 43251 Language Development 3
  - PSY 43308 Cognition & Emotion 3
  - PSY 43357 Food and the Brain 3
  - PSY 43360 Health Psychology 3
  - PSY 43562 The Sleeping Brain 3

**Additional Elective Requirements:**
- (3 courses required)
  - ANTH 20105 Human Ethology (10209) 3
  - ANTH 20201 Fund of Bio Anthropology 3
  - ANTH 30190 Infancy: History, Dev, Evo 3
  - ANTH 35110 Primates & Behavior 3
  - ANTH 40120 Evolution/Med Persp Fhood 3
  - ANTH 43310 Advanced Human Ethology 3
  - ACMS 4XXX Artificial Neural networks 3
  - ACMS 40740 Comp & Math Neuroscience 3
  - CHEM 30331 Chem in Service of Community 3
  - CHEM/NSBH 40404 Neuropathology 3

**SAMPLE CURRICULUM:**
The BA in Neuroscience and Behavior is flexible enough to allow students to spend a semester in their junior year studying abroad although this sample curriculum is not specific in this regard. This sample is simply intended as a general guide and curricular layout decisions should be made in conjunction with the Director of Undergraduate Studies.

**First Year:**
- **Fall Semester**
  - Gen CHEM 10171/11171 4
  - MATH 10350/10550 4
  - Intro Psych 3
  - WR13100 or Other 3
  - Moreau 1
- **Spring Semester**
  - Org CHEM 10172/11172 4
  - Elective 4
  - User 3
  - Theology I 3
  - Moreau 1

**Sophomore Year:**
- **Fall Semester**
  - NSBH Core 1: Systems Neuro w/lab 4
  - NSBH Core 2: Intro to Cog Neuro 3
  - Psych Statistics 4
  - CSEM 3
  - NSBH Prosem 1
- **Spring Semester**
  - NSBH Core 3: Molecular Neuro 3
  - BIOS 10172/11174 4
  - Psych Methods 4
  - Theology II 3
  - History 3

**Junior Year:**
- **Fall Semester**
  - NSBH Psych elective 1 3
  - Foundational Science Elective 4
  - Philosophy I 3
  - Language 4
  - Research Lab Credits 3
- **Spring Semester**
  - NSBH Additional Elective 1 3
  - NSBH Bios Elective 1 3
  - NSBH Psych Elective 2 3
  - Literature 3
  - Research Lab Credits 3

**Senior Year:**
- **Fall Semester**
  - NSBH Additional Elective 2 3
  - University Core 3
  - Art & Lit OR Adv Lang & Culture 3
  - Philosophy II 3
  - Research Lab Credits 3
- **Spring Semester**
  - NSBH Additional Elective 2 3

**PREMED CONCENTRATION**
In addition to the general BA, undergraduates interested in attending medical school have the option of completing a BA in Neuroscience and Behavior with a PreMed concentration. The PreMed concentration includes the requirements laid out above and also requires additional coursework laid out below:

**Medical School Requirements Category:**
- **(all courses required)**
  - MATH 10350/10550 (Core 2) 4
  - MATH 10360/10560 4
  - Gen CHEM 20172/21172 4
  - Org CHEM 20173/21173 4
  - PHYS I 10310 & Lab (or 20435/21435 or 10411/11411 or 20210/21210) 4
  - PHYS II 10320 & Lab (or 20435/21435 or 30220/31220 or 20220/21220) 4
Neuroscience and Behavior

**COURSE DESCRIPTIONS**

For a list of approved courses, contact the Director of Undergraduate Studies in the College of Science for this program, Nancy Michael (nmichael@nd.edu), or Anré Venter (aventer@nd.edu), the Director of Undergraduate Studies in the College of Arts & Letters. All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and searching within the home department of the course listing. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Biological Science Elective Category:**

3 Courses required (9 credits)

| BIOS 3044. Human Physiology | 3 |
| AND two (2) of the following courses: |
| BIOS 3039. Comparative Neurobiology | 3 |
| BIOS 3040. Animal Behavior | 3 |
| BIOS 3031. Embryology | 3 |
| BIOS 40339. Human Gross Anatomy | 3 |
| BIOS 60522. Behavioral Ecology | Variable |
| BIOS 60571. Topics in Physiology | Variable |
| BIOS 60572. Topics in Neuroscience | Variable |

**Psychology Elective Category:**

3 Courses required (9 credits)

| PSY 30160. Experimental Psychology II: Research methods | 4 |
| PSY 30220. Adolescent Development | 3 |
| PSY 30253. Introduction to Cognitive Development | 3 |
| PSY 30310. Abnormal Psychology | 3 |
| PSY 30358. Behavioral Medicine | 3 |
| PSY 30400. Cognitive Psychology | 3 |
| PSY 30430. Learning & Memory | 3 |
| PSY 30510. Intro to Biopsychology | 3 |
| PSY 30440. Sensation & Perception | 3 |
| PSY 30520. Introduction to Cognitive Neuroscience | 3 |
| PSY 40126. Introduction to Quantitative Neuroscience | 3 |
| PSY 40675. Artificial Intelligence | 3 |
| PSY 43250. Cognitive Development | 3 |
| PSY 43357. Food and the Brain | 3 |
| PSY 43360. Health Psychology | 3 |
| PSY 43526. The Sleeping Brain | 3 |
| PSY 65333. Neurophysiology of Stress | 3 |
| PSY 43540. Applied Hormones & Behavior | 3 |

**Additional Elective Category:**

3 Courses required (9 credits)

| CHEM 40420. Biochemistry | 3 |

AND a maximum of 6 credits of undergrad research with preapproved faculty advisors OR free choice from the Biological Sciences Elective Category OR the Psychology Elective Category listed above OR additional electives in other departments listed below:

| BIOS 20401: Biological Anthropology | 3 |
| ANTH 20105: Human Ethnology | 3 |
| ANTH 30140: Primatology | 3 |
| ANTH 35106: Primate Behavior | 3 |
| ANTH 35110: Primate Behavior & Ecology | 3 |
| PSY 43531: Psychology and Medicine | 3 |
| PHIL 34353: Philosophy of Mind | 3 |

Note: In addition, though not required here, students intending to go to medical school are highly encouraged to complete the Experimental Psychology II: Research Methods course in preparation for the MCAT exam.

**SAMPLE CURRICULUM:**

**First Year**

**Fall Semester**

Calculus A | 4

General Chemistry I & Lab | 4

Social Science** | 3

Writing & Rhetoric/Writing Intensive | 3

Theology* | 3

**Spring Semester**

Calculus B | 4

Organic Chemistry I & Lab | 4

Philosophy* | 3

Fine Art/Literature* | 3

Elective | 3

**Second Year**

**Fall Semester**

Biological Sciences I & Lab | 4

CSEM | 3

Psychology Major Elective*** | 3

Language | 3–4

**Spring Semester**

Biological Sciences II & Lab | 4

General Chemistry II & Lab | 4

Psychology Major Elective | 3

Language | 3–4

Research Lab | 3

**Junior Year**

**Fall Semester – ABROAD**

Physics I & Lab | 4

Philosophy/CAD* | 3

Fine Art/Literature* | 3

History* | 3

Elective | 3

**Spring Semester**

Physics II & Lab | 4

Neuroscience & Behavior (Lab) | 4

Additional Major Elective | 3

Research Lab | 3

Elective | 3

**Senior Year**

**Fall Semester**

Statistics | 3–4

Psychology Major Elective | 3

Biochemistry (Additional Major Elective) | 3

Biological Sciences Major Elective | 3

Research Lab | 3

**Spring Semester**

Additional Major Elective | 3

Human Physiology (Biological Sciences Major Elective) | 3

Biological Sciences Major Elective | 3

Theology* | 3

Research Lab | 3

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* These courses also fulfill the University Seminar Requirement

** Introductory Psychology fulfills this requirement as well as the Core Neuroscience & Behavior Major requirement

*** One of the Psychology Major Elective courses also fulfills the College Social Science Requirement

• This curriculum assumes 2 semesters of language at Notre Dame

**COURSE DESCRIPTIONS**

For a list of approved courses, contact the Director of Undergraduate Studies in the College of Science for this program, Nancy Michael (nmichael@nd.edu), or Anré Venter (aventer@nd.edu), the Director of Undergraduate Studies in the College of Arts & Letters. All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Neuroscience and Behavior. Course descriptions can be found by clicking on the subject code and course number in the search results.

To Table of Contents
Philosophy

Chair:
Jeffrey Speaks

F.J. and H.M. O'Neill Professor of Science, Technology and Values:
Kristin Shrader-Fechette (emerita)

Rev. Theodore M. Heidgerk Professors Emeritus of Arts and Letters:
Rev. David Burrell, C.S.C. (emeritus)
McManus-Hank Professors of Philosophy:
Karl Ameriks (emeritus); Patricia Blanchette; Daniel Nolan

Rev. John A. O'Brien Professors of Philosophy:
Robert Audi; Richard Cross; Alvin Plantinga (emeritus); Michael Rea

John Cardinal O'Hara Professor of Philosophy:
Peter Van Inwagen (emeritus)

George N. Shuster Professor of Philosophy:
Michal J. Loux (emeritus); Christopher Shields

Rev. John A. O'Brien Collegiate Chair and Professor of Philosophy:
Meghan Sullivan

Rev. John A. O'Brien Senior Research Professor (Emeritus):
Alasdair C. MacIntyre (emeritus)

Rev. John A. O'Brien Associate Professor:
Sean Kelsey

John and Jean Oesterle Professor of Thomistic Studies:
Therese Cory; Alfred Freddoso (emeritus)

Glynn Family Honors Professor of Philosophy:
Paul Weitman

William J. and Dorothy K. O'Neill Collegiate Associate Professor of Philosophy:
Samuel Newlands

Thomas J. and Robert T. Rolf Associate Professor of Philosophy:
Sara Bernstein

O'Neill Family Professor of Philosophy:
Je Beall

Professors:
Fred Dallmayr (emeritus); Cornelius F. Delaney; Michael R. DePaul (emeritus); Stephen Dumont; John Finnis (concurrent); Thomas P. Flint; Stephen Gersh (concurrent, emeritus); Vittorio Hösle (concurrent); Don A. Howard; Rev. John L. Jenkins, C.S.C.; Lynn Joy (emerita); Edward Manier (emeritus); Kristopher McDaniels; G. Felicitas Manzel (concurrent); Robert Norton (concurrent); David O'Connor; Gretchen Reydams-Schils (concurrent); Jeffrey Speaks; Mark Roche (concurrent); Fred Rush; Kenneth Sayre (emeritus); James P. Sterba; Ted A. Warfield; Stephen H. Watson

Associate Professors:
Timothy Bays; Shelah Brennan (emerita); Curtis Franks; Janet A. Kourany; Vaughn R. McKim (emeritus); John O'Callaghan; David Solomon (emeritus); Leopold Stubenberg (emeritus); Nicholas Teh

Assistant Professors:
Feraz Ashar; Laura Callahan; Brian Cutter; Katharina Kraus; Blake Roeber; Hannah Rubin; Michael Zhao

Associate Professor of the Practice:
Alexander Jech

Assistant Professor of the Practice:
David Cory; Shane Duarte

Assistant Teaching Professors:
Paul Blaschko; Justin Christy; Joshua Seachris

Program of Studies. There are two ways to major in philosophy: The courses required for regular philosophy majors are distributed as follows:
Either the two-course University Requirement, or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxx-level or higher; three specific core courses: a two-semester sequence in the history of philosophy, Ancient and Medieval Philosophy (PHIL 30301) and History of Modern Philosophy (PHIL 30302), and a course in formal logic (PHIL 30313); the logic requirement can also be fulfilled by PHIL 43907 or MATH 10130, but the latter does not count toward the classes required for the major; students taking it must take an additional elective; at least two seminars at the 4xxxx-level; and three electives at the 3xxxx- or 4xxxx-level. Students pursuing a major in philosophy with a concentration in Philosophy, Science, and Mathematics follow an overlapping, but distinct, course of study. The courses required for a concentration in Philosophy, Science, and Mathematics are distributed as follows: Either the two-course University Requirement or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxx-level or higher; the Core Seminar in Philosophy, Science, and Mathematics (an intensive team-taught seminar offered every fall); a course in logic (PHIL 30313 Formal Logic or a more advanced option); a survey of the history of philosophy (either Ancient & Medieval Philosophy, PHIL 30301, or History of Modern Philosophy, PHIL 30302); two other upper-level philosophy courses, taught at the 3xxxx- or 4xxxx-level, at least one of which will be in the philosophy of science, philosophy of mathematics, or logic; and three majors-level electives in science or mathematics.

Students who are pursuing either a regular philosophy major, or the major with concentration in philosophy, science, and mathematics, may also elect to pursue the Honors Track. Honors philosophy majors complete all the requirements for the regular major and in addition write a senior thesis. Students writing the senior thesis enroll in PHIL 48499 Senior Thesis in both semesters of the senior year (the equivalent of two regular 3-hour seminars). To be eligible for the honors major, and thus for the senior thesis, a student must ordinarily maintain a GPA of 3.5 or above in courses in the major. Students considering the senior thesis are encouraged to have completed at least two of the three core courses (the two history surveys and formal logic) AND three 4xxxx-level seminars by the end of the junior year.

Students majoring in other departments may take a minor in philosophy by completing the following course of study: the two University Required Philosophy courses or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxx-level or higher; the two-course sequence in the history of philosophy (Ancient and Medieval Philosophy, PHIL 30301, and History of Modern Philosophy, PHIL 30302); one elective at the 3xxx- or the 4xxx-level; and one elective at the 4xxxx-level.

All 4xxxx-level philosophy courses are writing-intensive, requiring at least 20 pages of written work that may take various forms: reflections on readings, class presentations, or shorter or longer research papers. Students planning to go on to graduate studies in philosophy or related disciplines typically write a senior thesis as well.

PHILOSOPHY AND THEOLOGY JOINT MAJOR

Director:
Gabriel Reynolds, Theology

Faculty:
Additional faculty for the joint major are drawn from the departments of philosophy and theology.

Program of Studies. The joint major is intended for undergraduates who are intrigued by philosophical and theological ideas and who have an equal commitment to both disciplines. It seeks to equip such students to handle theology and philosophy adeptly. The major is structured, providing undergraduates with a suitable introduction to the study of both disciplines, but also flexible, granting students considerable scope for the pursuit of their own interests.

The joint major offers the opportunity for an informed investigation of religious and philosophical ideas and should appeal especially to those who intend to pursue graduate work in philosophy or theology.

The joint major incorporates the University requirements for the two departments and most of the formal requirements of the first majors in theology and philosophy. Students in the joint major will take the two-semester sequence in Christian Traditions and an upper-level course in Scripture. The joint major, however, does not require the one-credit prosemian in theology.

Other formal requirements are peculiar to the joint major. Students will study a classical language for two semesters. (For practical as well as pedagogical reasons, this will normally be Greek.) Majors will also be expected to take one joint seminar. Led by

To Table of Contents
a theologian and a philosopher, the joint seminars are offered every spring and will examine an issue in which the differing approaches of philosophy and theology may prove fruitful. The topic and instructors will change from year to year. Finally, each major will submit a senior thesis prepared under the direction of two advisors, drawn from each department. At the option of the directors, this thesis may be presented and discussed in an informal colloquium consisting of the other students in the joint major.

The remaining courses in the joint major will be at the discretion of the student. Normally taken at the 40xxx level, there should be an equal distribution in the electives between theology and philosophy. However, students who wish may devote up to six hours within the joint major to additional language work. These hours may add to the classical language previously studied, or used to begin another language of significance for philosophical and theological work.

The joint major differs from a first major in one discipline and a supplementary major in the other in that the latter requires 55 credit hours, whereas the joint major requires 60. Furthermore, the joint major calls for language instruction beyond what the University requires for all undergraduates. Finally, the joint seminars should prove especially challenging, inviting students to explore important topics in an interdisciplinary way. These features should make the joint major particularly attractive to students preparing for advanced study.

Requirements in Philosophy:
Either the two-course University Requirement, or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 3xxxx-level or higher; the Core Seminar in Philosophy, Science, and Mathematics (offered every fall semester); three electives at the 3xxxx- or 4xxxx-level. (If a student has opted to take a Catholicism Across the Disciplines course instead of the second University Philosophy Requirement, then that student must take an extra elective at the 3xxxx- or 4xxxx-level.) At least one elective must be in the philosophy of science, philosophy of mathematics, logic, or the philosophy of logic. At least one elective must be at the 4xxxx-level.

Interested students should apply in the spring semester.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Philosophy. Course descriptions can be found by clicking on the subject code and course number in the search results.

MINOR IN PHILOSOPHY, SCIENCE, AND MATHEMATICS
In many cases, conceptual or foundational questions about mathematics and science cannot be pursued in a responsible way without competence in the relevant scientific or mathematical discipline. For this reason, the minor in Philosophy, Science, and Mathematics is open only to students who have significant scientific and/or mathematical training. The minor requires students to take six courses: either the two-course University Requirement or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher; the Core Seminar in Philosophy, Science, and Mathematics (offered every fall semester); three electives at the 3xxxx- or 4xxxx-level. (If a student has opted to take a Catholicism Across the Disciplines course instead of the second University Philosophy Requirement, then that student must take an extra elective at the 3xxxx- or 4xxxx-level.) At least one elective must be in the philosophy of science, philosophy of mathematics, logic, or the philosophy of logic. At least one elective must be at the 4xxxx-level.

Political Science
Chair:
David E. Campbell
Director of Graduate Studies:
Jeffrey Harden
Director of Undergraduate Studies:
Joshua B. Kaplan
Engene P. and Helen Conley Professor of Political Science:
Scott P. Mainwaring
Pachay J. Doe Professor of American Democracy:
David E. Campbell
Pachay J. Doe Professor Emeritus of Political Science:
Fred R. Dallmayr
Pachay J. Doe Professor of Political Science:
Dana Villa
Pachay J. Doe Professor of Political Science:
Michael C. Desch
Nancy Reeves Drexel Professor Emerita of Political Science:
Catherine H. Zuckert
Nancy Reeves Drexel Professor Emeritus of Political Science:
Michael P. Zuckert
Andrew J. McKenna Family Associate Professor:
Jeffrey Harden
Rev. Donald P. McNeill, C.S.C., Professor of Transformational Latina Leadership and Joseph and Elizabeth Robbie Professor of Political Science:
Luis R. Fraga
William M. Scholl Professor of International Affairs:
A. James McAdams
The Rev. Theodore M. Hesburgh, C.S.C., Professor Emeritus of Peace Studies:
George A. Lopez
David A. Potenziani Memorial Professor of Constitutional Studies:
Patrick J. Deneen (on leave fall 2020)
Professors:
Peri E. Arnold (emeritus); Sotirios A. Barber; Eileen Hunt Botting (on leave fall 2020);
Michael J. Coppsedge; Fred R. Dallmayr (emeritus); Darren Davis; Alan K. Dowty (emeritus); Amitava Krishna Dutt (on leave fall 2020); Gary Goertz; Matthew E.K. Hall; Robert Johansen (emeritus); Geoffrey C. Layman; David C. Lege (emeritus); Scott Mainwaring (on leave fall 2020); Peter R. Moody Jr. (emeritus);
Walter Niegorski (emeritus); Joseph M. Parent; Anibal Pérez-Liñán; Daniel Philpott; Dianne Pinderhughes; Benjamin Raddiiff; L. John Roos (emeritus); Rev. Timothy R. Scully, C.S.C.;
Joshua B. Kaplan
A. Peter Walshe (emeritus); Christina Wolbrecht
Associate Professors:
Jamie Bleck; Susan D. Collins; Rev. Robert A. Dowd, C.S.C.; Eugene Gholz; Andrew C. Gould; Jeffrey Harden; Victoria Hui (on leave fall 2020 and spring 2021); Debra Javeline; Mary M. Keys; Karrie J. Koessel; Dan Lindley; Vincent P. Muñiz (on leave fall 2020); Emilia Justyna Powell; Ricardo Ramirez; Sebastian Rosaro;
The political science major combines breadth and depth, helping students develop a general foundation for the study of politics and offering opportunities to explore particular areas of interest. Courses give students both a strong knowledge base and facility with the tools of political analysis. The department offers a substantial number of courses in all four fields of the discipline—American politics, international relations, comparative politics, and political theory—covering a range of topics and analytical perspectives. The major can prepare students for a wide variety of vocations. After graduation, many students go to law school or graduate school, or work for service organizations, government, or business.

Requirements. The major requires a minimum of 10 courses:

- four breadth requirements, consisting of a course in each of the four fields of political science: American politics, international relations, comparative politics, and political theory. Two of these must be introductory courses. The other two can be introductory courses or intermediate-level courses.
- four intermediate-level courses: students may specialize in one field or take courses in a combination of fields that suits their interests.
- two Political Science seminars. These seminars (POLS 33001/2, 43001/2, or 53001/2) fulfill the Arts and Letters directive that all majors include a writing-intensive requirement.

Senior Thesis. Students with a grade point average of 3.5 or above are encouraged to write a senior thesis. This two-semester project involves working closely with a faculty supervisor, and offers the opportunity to explore more deeply and independently a research project of the student’s choice.

Pi Sigma Alpha. Students who have taken a minimum of four political science courses, with a grade no lower than a B in their political science courses, and who are on theDean’s List are eligible to join Notre Dame’s chapter of Pi Sigma Alpha, the national honor society for political science majors.

Graduate Courses Many graduate courses are open to qualified undergraduates by permission.

Departmental Honors in Political Science The honors track in political science does not involve additional political science courses, but is designed to encourage students to make better use of their courses both within and outside the major, and prepare them for research in their senior year, and advanced study and work after graduation. To graduate with departmental honors, a student will:

1. take a cluster of four recommended enrichment courses in consultation with their advisor, including:
   a) a dedicated methodology course such as Research Design, Quantitative Political Analysis, or How to Do Political Research;
   b) Principles of Microeconomics and Principles of Macroeconomics. A student would need a compelling reason to offer a substitute for one of these two.
2. complete a senior thesis with a grade of B+ or higher;
3. graduate with a cumulative grade point average of 3.55 or higher. This number is subject to change from year to year.

The Political Science Department does not accept AP credit toward the major, but encourages students with a strong background in the field to meet with a departmental advisor to discuss ways of using it as a foundation to build on in their courses.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- Constitutional Studies
- Political Science

Course descriptions can be found by clicking on the subject code and course number in the search results.
Psychology

Chair:
Cindy S. Bergeman

Director of Graduate Studies:
Bradley S. Gibson

Director of Undergraduate Studies:
Anré Venter

Andrew J. McKenna Professor of Psychology:
David Watson

Notre Dame Chair in Psychology:
E. Mark Cummings

William J. and Dorothy K. O'Neill Professor of Psychology:
Lee Anna Clark

Professors:
Cindy S. Bergeman; James Brockmole; Thomas Burish; Laura Carlson; Lee Anna Clark; E. Mark Cummings; Bradley S. Gibson; Dawn M. Gondoli; Daniel K. Lapsley; Nicole McNiel; Thomas W. Merluzzi; G.A. Radvansky; David A. Smith; David Watson; Ke-Hai Yuan

Teaching Professor:
Anré Venter

Associate Professors:
Ying (Alison) Cheng; Kathleen Eberhard; Gerald Haeffel; Jessica Payne; Kristin Valentinio; Lijuan (Peggy) Wang; Guangjian Zhang; Zhiyong (Johnny) Zhang

Assistant Professors:
Brooke Ammerman; Joshua Koen; Laura Miller; Nathan Rose

Assistant Research Professor:
Mike Villano

BACHELOR OF ARTS IN PSYCHOLOGY

Program of Studies. Psychology is the scientific study of the behavior of organisms with a primary focus on human behavior. It is concerned with the biological and environmental determinants of behavior as reflected in the study of physiological, sensory, perceptual, cognitive, motivational, learning, developmental, aging, and social processes. The undergraduate program seeks a balance between exposure to basic psychological principles and theories and their extension to the applied areas such as child education, counseling, mental retardation, and behavioral deviancy.

The undergraduate courses are intended to meet the needs of students who plan to (1) major in psychology and later attend graduate school in psychology or affiliated fields, (2) major in psychology as part of a general cultural program, (3) obtain training in psychology as a special supplement to their major interest or (4) use psychology to satisfy social science requirements or electives.

One of the department's main features is an emphasis on opportunities for close faculty-student involvement in research projects at the undergraduate level. The research specialties in which majors may become involved range from basic research in such

Junior Year
First Semester
30301. Ethics 3
30411. Scientific Inquiry: Theories and Practices 3
30501. Music as a Liberal Art 3
33101. Great Books Seminar III 4
Elective 3

Second Semester
30202. Literature II: Shakespeare and Milton 3
30302. Political and Constitutional Theory: Ancient and Modern 3
33102. Great Books Seminar IV 4
Elective 3
Elective 3

Senior Year
First Semester
40301. Christian Theological Traditions 3
40601. Intellectual and Cultural History 3
43101. Great Books Seminar V 4
48701. Essay Tutorial 3
Elective 3

Second Semester
40302. Metaphysics and Epistemology 3
40412. Science, Society, and the Human Person 3
43102. Great Books Seminar VI 4
48702. Essay Tutorial 2
Elective 3

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Program of Liberal Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

SEQUENCE OF COURSES

Sophomore Year
First Semester
20201. Literature I: The Lyric Poem 3
20301. Philosophical Inquiry 3
23101. Great Books Seminar I 4
Elective 3
Elective 3

Second Semester
20302. Bible and Its Interpretation 3
20412. Fundamental Concepts of Natural Science 3
23102. Great Books Seminar II 4
Elective 3
Elective 3

To Table of Contents
areas as psychophysics, human and animal learning, child development, aging, and psycholinguistics, to applied research in a community setting. Students planning to do graduate work in psychology will need faculty advisors. Planning to do graduate work in psychology will also need to take Introductory Psychology Course (3 credits from either PSY 10000 for first year students or PSY 20000 for upper-class students). This course serves as a prerequisite or corequisite for the Psychology Major courses. Students who have achieved a 5 on the AP Psychology exam are not required to take the Introductory Psychology Course. Students who have achieved a 5 on the AP Psychology exam are not required to take the Introductory Psychology Course. However, these students will be required to complete an additional psychology course (from the 30000 or 40000 level categories) to complete the requisite number of psychology courses to graduate with the major.

Note:
- Introductory Psychology does not fulfill any of the 30-credit-hour requirements for the major.
- PSY 27800 Research Lab credits are strongly recommended for any students intent on pursuing a graduate career in psychology.
- In some cases, students for whom psychology is their second major may complete another statistics course (RAMG 20150; ECON 30530, ACMS 20340 or BIOS 40411) in place of the PSY 30100 course. However, these students will be required to complete an additional psychology course (from the 30000 or 40000 level categories) to complete the requisite number of psychology courses to graduate with the major.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Psychology. Course descriptions can be found by clicking on the subject code and course number in the search results.

30000 Content Area Courses:
A minimum of 2 courses (6 credits) from each of the following categories (total of 12 credits minimum)

Class A Courses
PSY 30200. Developmental Psychology 3
PSY 30220. Adolescent Development 3
PSY 30300. Personality Psychology 3
PSY 30310. Abnormal Psychology 3
PSY 30312. Child & Adolescent Psychopathology 3
PSY 30314. Introduction to Clinical Psychology 3
PSY 30600. Social Psychology 3
PSY 30634. Psychology of Peace 3

Class B Courses
PSY 30253. An Introduction to Cognitive Development 3
PSY 30312. Cognitive Aging 3
PSY 30400. Cognitive Psychology 3
PSY 30430. Learning & Memory 3
PSY 30440. Sensation & Perception 3
PSY 30501. Introduction to Biopsychology 3
PSY 30510. Behavioral Genetics 3
PSY 30520. Introduction to Cognitive Neuroscience 3

40000 Senior Seminar Courses:
A minimum of 2 courses (6 credits) from this category. These are small, in-depth discussion-oriented seminars generally in the instructor’s specific area of expertise and the options may vary from semester to semester or year to year. All 40000 level seminars are designated writing-intensive courses, satisfying the College of Arts and Letters writing requirement. (See the introductory portion of the Arts and Letters section.)
interpretation of foreign language texts. Participation in Notre Dame's international study programs in Brazil, Chile, France, Italy, Mexico, and Spain (see the International Study Programs section of this Bulletin) is highly recommended although not required to pursue a major in Romance languages and literatures. Majors and supplementary majors in French, Italian, and Spanish must complete 50 percent of their credit hours in the major in residency at Notre Dame and meet the following program requirements. For current information visit the department website: http://romancelanguages.nd.edu/.

PROGRAM IN FRENCH AND FRANCOPHONE STUDIES

The Major in French and Francophone Studies

The requirements for a major in French and Francophone Studies consist of successful completion of 30 credit hours or 10 courses above ROFR 20201. Of these 10 courses, no more than three may be at the 20xx level (20202 and above), six must be in literature/culture studies, and at least half must be taken in residence at Notre Dame. Required among these 10 courses are ROFR 30310 (The Art of Interpretation), ROFR 30710 and ROFR 30720 (French Literature and Culture I & II), at least two courses at the 40xxx level, and the Senior Seminar (ROFR 53000). ROFR 30310 (The Art of Interpretation) is the recommended prerequisite for the survey courses (ROFR 30710 and ROFR 30720) and must be completed by the end of junior year. The requirement of ROFR 30720 (French Literature and Culture II) may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Preapproved courses at the Université Catholique de l’Ouest in Angers (IALH 1.1, 1.2, 4.2, and 6.1) may also fulfill the required courses ROFR 30310, ROFR 30710, and/or ROFR 30720 (see the Angers pages in this Bulletin for a description of those courses and their equivalencies at Notre Dame). ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged. AP credit may not be applied to the major.

Faculty in the Program in French and Francophone Studies are glad to serve as directors to students seeking to write a senior thesis. The thesis can be either in ROFR or in International Economics, and can be written in English or in French. Interested students should make contact during the junior year to pursue this option.

Minor in French and Francophone Studies:
The requirements for a first minor in French and Francophone Studies include demonstrated competency in the language and successful completion of 15 credit hours or 5 courses above ROFR 20215. At least half of the minor courses must be taken in residence at Notre Dame. Of the 5 required courses, no more than 2 may be at the 20000 level (i.e., 20300 and above) and a minimum of 1 must be at the 40000 level. Minors are required to take ONE of the following courses: ROFR 30310, 30710 OR 30720. Although it is expected that the course from this level be taken in residence at Notre Dame, an equivalent course from international study programs or other universities may be substituted, as explained in the Undergraduate Bulletin. The 40000 level course must be taken in residence at Notre Dame. No course may be taken in English. AP credit may not be applied to the minor.

The Supplementary Major in French and Francophone Studies: Two Tracks

There are two tracks available for students seeking a supplementary major: The “Language and Literature” track and the “Language and Culture” track.

Language and Literature Track

Requirements for the “Language and Literature” track consist of successful completion of 24 credit hours or eight courses above ROFR 20202. Of these eight courses, no more than two may be at the 20xx level (20202 or above), one must be ROFR 206xx or above, and six must be in literature/culture studies, and at least half must be taken in residence at Notre Dame. Required among these eight courses are ROFR 30310 (The Art of Interpretation), ROFR 30710 and ROFR 30720 (French Literature and Culture I & II), and at least two courses at the 40xx level or above, one of which may be the Senior Seminar (ROFR 53000). ROFR 30310 (The Art of Interpretation) is the recommended prerequisite for the survey courses (ROFR 30710 and ROFR 30720) and must be completed by the end of junior year. The requirement of ROFR 30720 (French Literature and Culture II) may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Preapproved courses at the Université Catholique de l’Ouest in Angers (IALH 1.1, 1.2, 4.2, and 6.1) may also fulfill the required courses ROFR 30310, ROFR 30710, and/or ROFR 30720 (see the Angers pages in this Bulletin for a description of those courses and their equivalencies at Notre Dame). ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged. AP credit may not be applied to the major.

Language and Culture Track

Requirements for the “Language and Culture” track consist of successful completion of 24 credit hours or eight courses above ROFR 20202. Of these eight courses, no more than two may be at the 20xx level (20202 or above), one must be ROFR 206xx or above, and six must be in language/culture/literature studies, and at least half must be taken in residence at Notre Dame. Required among the eight courses are: ROFR 30310 (The Art of Interpretation) or ROFR 30720 (Advanced Composition: The Art of Writing); one survey class of French literature (ROFR 30710 or ROFR 30720); and ROFR 306xx. The survey class of French literature may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Some courses at the Université Catholique de l’Ouest in Angers may also fulfill the required courses, as in the “Language and Literature” track (see above). AP credit may not be applied to the major.

The Honors Track in French

The honors track major consists of 33 credits or 11 courses. In addition to the general requirements for the major, honors track students must complete an 11th course at the graduate level with a grade of A- or higher, in which they will write a substantive research paper, normally in French, which constitutes the honors thesis. By invitation only, highly motivated students may consider the option of taking a semester-long directed reading tutorial as the 11th course, completing an honors thesis under faculty direction.

French majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. To be eligible for the honors track, students must be first majors with a minimum GPA of 3.8 in French and have completed at least seven courses toward the major by the end of their junior year. They must also receive the written support of a professor in one of the required language, culture, or literature courses (ROFR 30310, ROFR 30320, ROFR 30710, ROFR 30720, ROFR 306XX or ROFR 37500). For full consideration, students should contact the Assistant Chair of the Department of Romance Languages and Literatures no later than March 15 of their junior year; applications from eligible seniors will be accepted through October 1. In order to graduate with honors, students admitted to the honors track should maintain a minimum GPA of 3.7 in French.

Combined B.A./M.A. Program in French

The Department of Romance Languages and Literatures offers its majors in French the opportunity to participate in its graduate program through a combination B.A./M.A. degree in French. This program requires students to take 30 credit hours during the normal four-year undergraduate period, followed by a total of 30 credit hours of graduate courses taken during the fourth and fifth years of residence. Six credit hours can be counted toward both the undergraduate and graduate degrees. During their senior year, participants in this program take two graduate courses, take the qualifying exam given to all first-year graduate students, and apply to the Graduate School for admission during the Spring semester. B.A./M.A. Students are eligible for a teaching fellowship during their fifth year that includes a tuition waiver and a generous teaching stipend. Well qualified students who are interested in this program should contact the Director of Graduate Studies and/or the graduate coordinator in French at the beginning of their junior year.
PROGRAM IN ITALIAN LITERATURE AND CULTURE

The undergraduate program in Italian offers a major, a supplementary major, and an honors track major in each of two possible concentrations: (1) Italian literature and culture; (2) Italian Studies. In addition, the program also offers (3) a minor in Italian, as well as the opportunity to focus on Italian through (4) the Romance Languages major or (5) the International Economics major (discussed separately in the Bulletin). The Italian program does not cap double-counting from other requirements.

(1) Literature and Culture Concentration

The major in Italian: Literature and Culture Concentration

The major in Italian with a concentration in literature and culture requires 30 credits or 10 courses at the 20000 level or above, including no more than two 20000-level courses (ROIT 20215 counts as two courses for the major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of five elective ROIT courses in Italian literature or culture at the 30000 or 40000 level or above. ROIT 30310 (Passage to Italy) is recommended for all majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Supplementary Major in Italian: Literature and Culture Concentration

Supplementary majors in Italian with a concentration in literature and culture are expected to demonstrate competency in the language and to complete 24 credits or eight courses at the 20xxx level or above, including no more than two 20xxx-level courses (ROIT 20215 counts as two courses for the supplementary major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of three elective ROIT courses in Italian literature or culture at the 30xxx or 40xxx level or above, ROIT 30310 (Passage to Italy) is recommended for all supplementary majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Honors Track Major in Italian: Literature and Culture Concentration

The honors track major in Italian with a concentration in literature and culture consists of 33 credits or 11 courses, including all the requirements for the major, a GPA in the major of at least 3.6, plus a substantial final essay, to be written in Italian for a graduate course or for ROIT 58000, Honors Thesis Direction, which will constitute the 11th course. All honors track majors should enroll in ROIT 53000 Italian Seminar in the fall semester of the year they write their thesis. No students will be accepted to the honors track after September 15 of their senior year.

(2) Italian Studies Concentration

The Major in Italian: Italian Studies Concentration

The major in Italian with a concentration in Italian Studies requires 30 credits or 10 courses at the 20000 level or above, to be chosen as follows: Five courses must be ROIT courses in Italian language, literature, and culture taught in Italian, including at least one of ROIT 30711 (Medieval-Renaissance Italian Literature and Culture) or ROIT 30721 (Modern Italian Literature and Culture), and one course at the 40000 level or above. No more than two of these five courses may be at the 20000 level (ROIT 20215 counts as two courses for the major). The other five courses must be on Italian subjects or strictly relevant to Italian culture, and together they must not be drawn from more than three disciplines or departments, such as history, art history, classics, FTT, music, or political science (the courses may of course be listed under ROIT). Four of these five courses must be at the 30000 level or above, and include at least one course at the 40000 level or above; no more than one of the five may be at the 20000 level. In order to create a coherent program, the selection of courses must be approved by the student's ROIT adviser (or committee, if appropriate). Equivalent courses from foreign study programs or other universities may be substituted by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Supplementary Major in Italian: Italian Studies Concentration

Supplementary majors in Italian with a concentration in Italian Studies requires 24 credits or eight courses at the 20000 level or above, including no more than two 20xxx-level courses (ROIT 20215 counts as two courses for the supplementary major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of three elective ROIT courses in Italian literature or culture at the 30xxx or 40xxx level or above, ROIT 30310 (Passage to Italy) is recommended for all supplementary majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Honors Track Major in Italian: Italian Studies Concentration

The honors track major with a concentration in Italian Studies consists of 33 credits or 11 courses, including all the requirements for the major. The honors track major in Italian with a concentration in Italian Studies, a GPA in the major of at least 3.6, plus a substantial final essay, to be written for a graduate course or for ROIT 58000, Honors Thesis Direction, which will constitute the 11th course. The course or topic will be selected in consultation with the student's advisory committee for the major. All honors track majors should enroll in ROIT 53000 Italian Seminar in the fall semester of the year they write their thesis. No students will be accepted to the honors track after September 15 of their senior year.

(3) The Minor in Italian

The minor in Italian comprises 15 credits or five courses at the 20000 level or above, including at least three courses at the 30000 or 40000 level. Three of the five courses must be ROIT courses in Italian language, literature, and culture, and taught in Italian; the fourth and fifth courses may be on Italian literature and culture taught in English or with texts in translation, or may be courses on Italian subjects originating in other disciplines or departments (for example, LLRO, art history, architecture, or history). Courses from study abroad programs or other universities may be substituted by permission, but at least two courses for the Italian minor must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

PROGRAM IN IBERIAN AND LATIN AMERICAN STUDIES

All majors and supplementary majors in Spanish are required to take a core sequence consisting of ROSP 30310 (Introduction to Hispanic Literature and Cultures) and one course each in three of the four following areas of Spanish and Spanish American Literature: Early Peninsular, Modern Peninsular, Early Spanish American and Modern Spanish American. AP credit may not be applied toward the major.

The Major in Spanish

The major in Spanish requires 30 credits or 10 courses 20202 and above, including the required core sequence described above, two senior-level courses, and the Senior Seminar. Equivalent literature and culture courses from international
study abroad programs or other universities may be substituted with departmental approval. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

Students are allowed to take one related course in English outside of the Department of Romance Languages and Literatures (for example, Colonial Latin American History, taken in the History Department) or one course in Spanish outside of the discipline of literature and culture (for example, a theology course taken in Spanish in a study abroad program), with the approval of the Assistant Chair.

The Supplementary Major in Spanish
Supplementary majors in Spanish are required to complete 24 hours or eight courses 20202 and above, including the required core sequence described above and one senior-level course. Equivalent literature and culture courses from international study abroad programs or other universities may be substituted with departmental approval. Fifty percent of the credits for the supplementary major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

Students are allowed to take one related course in English outside of the Department of Romance Languages and Literatures (for example, Colonial Latin American History, taken in the History Department) or one course in Spanish outside of the discipline of literature and culture (for example, a theology course taken in Spanish in a study abroad program), with the approval of the Assistant Chair.

The Honors Track in Spanish
The honors track major consists of the general requirements for the major (30 credits or 10 courses) plus 3 extra credits which may be completed in one of two ways. First, after taking the Senior Research Seminar the student may take a semester-long Honors Thesis tutorial in the spring as the 11th course, completing an honors thesis under faculty direction. Or, second, the student may take an 11th course at the graduate level, in which they must complete a substantial research paper and receive a grade of A– or higher to graduate with honors.

Spanish majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. To be eligible for the honors track, students must take at least one course that addresses a discipline (for example, anthropology, history, FTT, political science, Romance languages and literatures, theology, etc.). Courses from study abroad programs or other universities may be substituted by permission, but at least three courses for the Portuguese minor must be taken in residence at Notre Dame.

AP credit may not be applied toward the minor.

Interdisciplinary Minors
Spanish majors are encouraged to pursue allied courses offered through other interdisciplinary minors. Spanish courses offer a particularly appropriate complement to the Latino Studies and European Studies programs. See the section on Interdisciplinary Minors in this Bulletin for more details. Majors may also apply one senior-level ROPPO course in Luso-Brazilian culture and literature toward their elective credits.

MAJOR IN ROMANCE LANGUAGES AND LITERATURES
The undergraduate major in Romance Languages and Literatures is designed for qualified students who wish to major in two programs (French, Italian, or Spanish). Cross-cultural in focus, the major recognizes the importance of studying the correspondences and differences among various Romance literatures and cultures and of reexamining traditional disciplinary boundaries. The requirements for a major in Romance languages and literatures include competency in two languages and successful completion of 36 credit hours or 12 courses, which must be distributed equally between the two respective language programs as follows:

(1) Two survey courses in each language and literature program (French or Italian); Spanish requires either four area courses (two in Peninsular and two in Latin American) or a combination of two area courses and two senior-level courses in the other areas;

(2) 30310 in one program;

(3) Two 40xxx-level courses in each program (if the area requirement in Spanish is fulfilled with two senior-level courses, these courses may count for the senior-level requirement in Spanish);

(4) One Senior Seminar (530000) in one program;

(5) Two elective courses at the 20202 or above level, one in each program (any exception requires permission).

The Honors Track in Romance Languages and Literatures
To be eligible for the honors track, students in Romance Languages and Literatures must be first majors with a minimum GPA of 3.7 in the major, and will have completed at least eight courses toward the major. It is strongly recommended that students take at least one 40000-level class in the major at Notre Dame by the end of their junior year. In addition to the general requirements for the major, honors track students will maintain a 3.7 GPA in the major through graduation and complete one graduate-level course in one of the Romance languages with a grade of A- or higher. Highly motivated students who have already been accepted to the honors track may be invited to complete an honors thesis in lieu of taking the graduate course. The honors thesis option must be carried out under the direction of a department faculty member, in the area of specialization. Students will identify the professor with whom he or she intends to work, obtain approval of the topic, and submit application materials by March 15th of the junior year to the Director of Undergraduate Studies. Students are also encouraged to take at least one course that addresses cultural or literary theoretical questions and readings; this course may be a 40000-level course offered in the Department of Romance Languages, or a similar course in a related field (English, gender studies, FTT, philosophy, sociology, etc.). Romance languages and literatures majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. For full consideration, students should contact the advisor for the romance languages and literatures major no later than March 15 of their junior year. Applications for eligible seniors will be accepted through October 1st.
Placement in Language Courses
For French and Spanish, there is an online placement exam for students who have not already demonstrated language proficiency through national standardized testing, such as the AP or Achievement tests. Students with previous experience are required to take one of these tests before enrolling in their first course in those languages. For Italian or Portuguese placement, please contact the department. The normal prerequisite for a 30xxx-level course is at least one 20202 or above level course. The normal prerequisite for a 40xxx-level course is at least one 30xxx-level course or permission of the instructor.

Policy Regarding Romance Language Placement Examination
The placement examination is designed to place each student at an appropriate level within a language sequence. Obtain placement examination information from the Department of Romance Languages and Literatures.

MAJOR IN INTERNATIONAL ECONOMICS & ROMANCE LANGUAGES

The undergraduate major in International Economics is a collaborative effort between the Department of Economics and the Department of Romance Languages and Literatures. In pursuing this major, students take a minimum of eight economics courses and at least six intermediate and advanced courses in French, Italian or Spanish. Students are also required to enroll in a one-credit course “Exploring International Economics” designed to foster the integration of the study of culture with the study of economics. Students must also complete a senior research project or equivalent designed to integrate their economic and language and culture study. The senior research project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a romance language.

Students must satisfy a mathematics requirement of Calculus I and II and successfully complete ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; and either ECON 40700 and ECON 40800, or ECON 40710 and ECON 40720 or other international economics courses as approved by the Director of Undergraduate Studies. In addition, students must complete at least one fourth semester or above language and culture course (ROXX 20202 or above), “Exploring International Economics” (brevily described above); one introduction to literature and culture course (ROXX 30310); two 30000 level courses including literature survey courses (ROXX 30710, 30720, and/or ROSP 30810, ROSP 30820) or equivalent, and/or culture courses ROFR 306XX; at least two courses at the 40000 level (one may be taught in English); and the Senior Research Project (ECON 48100).

Through the major, the collaborating departments seek to blend two programs of study to ensure that students will achieve advanced linguistic and cultural competency in a foreign language as well as excellent preparation in Economics. The balance of economics with languages and culture courses should attract motivated students and inspire them to undertake a challenging course of study that will prepare them for post-graduate studies and or professional career opportunities in the international arena. International Economics Romance Languages majors will learn how aesthetic and cultural categories and value judgments are shaped by economic trends and political conditions and how political conditions and economic trends are influenced by aesthetic and cultural trends.

**COURSE DESCRIPTIONS**

All of the courses associated with these academic programs can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- **Romance Languages & Literature**
- **French**
- **Italian**
- **Portuguese**
- **Spanish**

Course descriptions can be found by clicking on the subject code and course number in the search results.
MAJOR

The sociology major offers our students both structure and flexibility. In addition to providing students with a strong foundation in the core of the discipline, sociology at Notre Dame also encourages our students to explore and study in depth several areas of specialization, including race and ethnicity, immigration, gender, education, religion, family, crime, law, culture, social networks, and inequality.

The requirements of the major are as follows:

(a) Students must take a minimum of 31 credit hours (usually 10 courses and the proseminar which is one credit) offered by the department. Students are urged to start their major as early as possible but may declare a major or change majors at any time as long as they are able to fulfill the requirements.

(b) Central to the requirements for the major are the following four courses:

- SOC 30900. Foundations of Sociological Theory
- SOC 30902. Methods of Sociological Research, or
- SOC 30952. International Research Design
- SOC 30903. Statistics for Sociological Research
- SOC 33090. Proseminar (1 credit)

The above required courses should be taken as soon as possible, especially before taking any 4xxx-level courses.

(c) Each major must take a minimum of three 4xxx-level lecture, seminar or research courses. Internships (SOC 45000) and Directed Readings in Sociology (SOC 46000) do not fulfill this requirement.

(d) Each major must also acquire at least 12 credits of sociology elective courses, usually consisting of four 3-credit courses. These courses may be at any level, 10xxx–4xxxx.

MINOR

Additionally, the Sociology Department offers a minor, requiring 15 credit hours. Students minoring in sociology not only gain unique insight into the complexity of social life but also develop practical skills which enhance their major field of study. The sociological imagination teaches students how to understand context and is therefore relevant for success in the classroom and beyond.

The requirements of the minor are as follows:

(a) One course in sociological theory, usually SOC 30900, Foundations of Sociological Thought (3 credits)

(b) SOC 30902. Methods of Sociological Research or SOC 30952, International Research Design (3 credits)

(c) Two sociology electives at any level, only one of which may be at the 10000 level (6 credits)

(d) At least one sociology elective at the 40000 level (3 credits)

Our Students. Because of its broad applicability, strong emphasis on both qualitative as well as quantitative aspects of social life and commitment to Notre Dame’s continuing mission to promote human solidarity and concern for the common good, Sociology at Notre Dame attracts students with a variety of interests, strengths and goals. Many of our students have double majors in areas such as Business, Pre-Health, Engineering, Political Science, Mathematics, Psychology and Liberal Studies among many others. Our majors also pursue numerous minors including Poverty Studies, Peace Studies, Business Economics and Education, Schooling and Society.

The department has an active Epsilon Chapter of Alpha Kappa Delta, the international sociology honor society. Students interested in the qualifications for nomination are encouraged to contact the director of undergraduate studies (Room 823 Flanner Hall) at any time.

Sociology Undergraduate Honors Track. The Department of Sociology offers academically gifted and highly motivated students the opportunity to graduate with departmental honors. In order to participate in the honors track, students must be at least a first semester junior with a minimum major GPA of 3.5.

The requirements for pursuing the sociology honors track are as follows:

- Students must maintain a 3.5 major GPA.
- Students are required to take a 3-credit standard graded graduate level sociology course. While any graduate sociology class is open to students on the honors track, students are required to get permission from the class instructor, prior to requesting departmental approval from the DUS.
- Including the required graduate class, students on the honors track are required to earn at least 34 credits in sociology.
- Students are required to complete a senior thesis.

Writing in Sociology. The College of Arts and Letters is proud of the level of writing its undergraduates achieve. One way in which the college supports students’ writing development is by requiring each department to offer at least one writing-intensive course. SOC 30900, Foundations of Sociological Theory, is the Sociology Department’s writing-intensive course. There, students reflect on the quality of their own and others’ writing and learn to articulate a sociological perspective in writing. Instructors in this course may spend more time doing textual analyses, going over students’ writing, holding in-class writing workshops, and giving opportunities to do re-writes than in other courses. The department’s 4xxx-level courses also demand high-level writing within a sociological perspective. In addition, students may opt to develop their research and writing skills by undertaking a senior thesis.

Course Listings by Area of Research Focus. The following is a list of courses offered by the Sociology Department, organized by research focus. Students are encouraged (but not required) to choose at least one area of focus in the major in order to deepen their knowledge of that area. Students are also encouraged to pursue research opportunities within their area of interest.

GENERAL INTRODUCTIONS TO SOCIOLOGY

10002/20002. Understanding Societies
10033/20033. Introduction to Social Problems
10722/20722. Introduction to Social Psychology
10723/20723. Social Psychology for Pre-Health Students
23011. Selflessness and Selfishness

REQUIRED COURSES FOR SOCIOLOGY MAJORS

30900. Foundations of Sociological Theory
30902. Methods of Sociological Research, or
30952. International Research Methods
30903. Statistics for Sociological Research
33090. Sociology Proseminar

INDIVIDUAL WORK WITH FACULTY/SUPERVISOR

41800. Senior Thesis Workshop
45000. Sociology Internship
46000. Directed Readings in Sociology
48000. Directed Research in Sociology
48009. Senior Thesis Capstone Project

CLASS, RACE, ETHNICITY

20870. Inner City America: Decoding “The Wire”
30003. Critical Refugee Studies
30806. Race and Ethnicity: Constructing Identity and Difference
30819. Race, Sport and Inequality
30838. Poverty, Inequality, and Social Stratification
40803. Social Inequality
40838. Race Relations and Ethnic Conflict
43281. Racial and Ethnic Educational Inequality
43581. Race and Activism
43839. Unequal America

CRIMINOLOGY, DEVIANCE, AND SOCIAL CONTROL

10732/20732. Introduction to Criminology
43704. Law, Society and Criminal Justice in the U.S.

CULTURE/MEDIA

20100. Introduction to Cultural Sociology
23195. Media, Technology, and the Good Life
34121. Youth, Social Media and Development
40200. Visualizing Social Change
43101. Telling About Society: Media, Representation, and the Sociology of Knowledge
43110. Sociology of Media, Technology, and Society
43113. Cultural Sociology
43170. Materialism & Meaning in Modern Life
43165. Art in Everyday Life

To Table of Contents
Sociology

43200. Sesame Street Around the World: Organizations and Globalization

DEMOGRAPHY/MEDICAL/ENVIRONMENT
20666. Environment, Food and Society
21666. Environment, Food and Society Lab
10723/20723. Social Psychology for Pre-Health Students
20410. Health, Medicine, and Society
43402. Population Dynamics
43471. Social Aspects of Mental Health

ECONOMICS, POLITICAL, DEVELOPMENT
20501. Globalization and Social Movements
10502/20502. Surviving the Iron Cage: Organizations in a Complex World
20541. Sociology of War and Terror
20550. Development and Human Well-being
30518. Sociology of Money
33501. Political Protest in a Globalizing World
40050. Social Movements, Conflict, and Peacebuilding
40604. When Tolerance is Not Enough
40838. Racial and Ethnic Conflict in the U.S.
43510. Governance and Africa
43513. Sociology of Development
43524. Employment in a Changing Economy
43553. Building Democratic Institutions
43555. State Effectiveness in Developing Countries
43556. Religion is Revolting
43579. Social Organization of Secrecy and Deception
43590. Sociology of Economic Life

EDUCATION
20228. Social Inequality and American Education
43212. Can We Improve US Schools?
43281. Racial/Ethnic Educational Inequality

FAMILY & GENDER
20342/10342. Marriage and the Family
20810. Gender Roles and Violence
20818. The Sociology of Sexuality
43377. Family, Gender and Employment
43380. Gender and Sexualities in Family
43316. The Cultural Politics of Religion and Women’s Human Rights
43318. Sociology of Sexuality

LATINO STUDIES
20479. Introduction to Latinos in American Society
33458. Mexico-U.S. Border Immersion Seminar
43479. International Migration and Human Rights

RELIGION
10672/20672. Deities, Denominations, and Diversity
20610. Sociology of Religion
43516. The Cultural Politics of Religion and Women’s Human Rights
43556. Religion is Revolting
43600. Society and Spirit: Religion in Classical Social Thought
48666. Sociology of Religion Research Seminar

SOCIAL PSYCHOLOGY
10722. Introduction to Social Psychology
10723/20723. Social Psychology for Pre-Health Students
20722. Introduction to Social Psychology
33001. Society, Self, and Catholic Social Tradition
43719. Self, Society, and the Environment
43959. How Did I Get Here and Where am I Going?

THEORY/METHODOLOGY/STATISTICS
23901. Power & Identities
30903. Statistics for Sociological Research
30952. International Research Design
35900. Sociology Research Apprenticeship
38909. Intro to Causal Inference
43910. Contemporary Social Theory
43919. Text Analysis for Social Science
43959. Sociology of the Life Course
43990. Social Networks
43991. Sociology Research Practicum
43999. Quantitative Methods Social Sciences

MINOR IN DATA SCIENCE
Leadership:
Thomas Mustillo, Program Director
(associate professor of Global Affairs)
Patrick Flynn, Academic Advisory Committee
(Professor and Chair of the Department of Computer Science and Engineering)
Roger Woodard, Academic Advisory Committee
(Professor, Department of Applied and Computational Mathematics and Statistics)
Mim Thomas, Advisor (Assistant Professional Specialist and Director of Undergraduate Studies of Sociology)

Housed in the Department of Sociology, the Data Science Minor is a cross-college venture between the College of Arts and Letters and the College of Science. The minor accepts the following classes: SOC30903 Statistics for Sociological Research; ECON30330, Statistics for Economics; Math30540 Mathematical Statistics; PSY30100 Experimental Psychology I: Statistics; ACMS20340 Statistics for Life Sciences; ACMS30440 Probability and Statistics; ACMS30600 Statistical Methods and Data Analysis; ITAO 20200/BAMG 20180 Statistical Inference in Business.

If students are using the same statistics course to fulfill both the MDSC requirement and a college, university, major or other minor requirement, they must contact their dean or major advisor to see if an additional course (not another statistics course) is required or if the course can be double counted.

Students may petition to have other statistics courses accepted to fulfill the requirement, by contacting Mim Thomas (mthoma13@nd.edu).

ELECTIVES
ACMS 34445. Probability and Statistics for Data Science
ANTH 43200. The Social Species
BIOS 30318. Introduction to Biocomputing
CSE 10102/CDT 30200/ CDT 34020 Elements of Computing II
CSE 40171. Al and Social Good
CSE 40838. Data Visualization
CSE 44640. Data Science
DES 40120. Visual Communication Design
ITAO 20200/BAMG 20180 Statistical Inference in Business.

Data Science is a fifteen credit interdisciplinary minor, offering classes from departments across the university, including Sociology, Computer Science Engineering, Psychology, Economics, English, Philosophy and Design.

REQUIREMENTS
CSE 10101/CDT 30010. Elements of Computing I
MDSC 20009/SOC 20009. Introduction to Data Science
One Class in Statistics

To Table of Contents
THEOLOGY PROGRAM
UNIVERSITY OF NOTRE DAME

At the University of Notre Dame, the study of theology is carried out in the spirit of the classic formulation of theology as "Faith seeking understanding." The Theology Department dedicates itself to critical reflection on the historic faith of Catholic Christianity in service to our students, to the larger church, to the world of the academy, and to the general public.

Why major in theology?
When the former British prime minister Tony Blair was asked what effect his embrace of Christian faith at the University of Oxford had on him, he commented simply, "I began to make sense of the world." A major in Theology at Notre Dame will challenge you to do just that.

Our majors encounter head-on the great questions of life: Where is the God of justice? What is truth? Who do you say I am? Why did God become a human? What must I do to inherit eternal life?

Yet majors in theology are challenged to do still more. They are challenged to think of their life journey not only in terms of how they might best be served by careers, but also how they might best serve others. Whether they go on to careers in law, medicine, business, journalism, education, ministry, government, or any other field, theology majors do so with an experience of intellectual and spiritual illumination that is absolutely unique.

Our majors also benefit from working closely with faculty in one of the premiere Catholic Departments of Theology in the world. Theology majors at Notre Dame have majored in a field for which Notre Dame is renowned and will study with the best of the best. In addition, our majors may have the opportunity to visit the Holy Land at the Tantur Ecumenical Institute of Theology in Jerusalem, where the department regularly hosts courses and pilgrimages during fall and spring break.

When Father Edward Sorin, C.S.C., envisioned the school that would be built next to two remote lakes
in Indiana, he commented, “This college will be one of the most powerful means of doing good in the country.” This faith in the great potential of the school that would be called Notre Dame emerged from his belief in a Catholic education. Theology majors at Notre Dame, having experienced the fullness of a Catholic education, are indeed powerful forces for good in this country, and in the world.

What are the requirements for the theology major?
Beyond the six theology credits required of every Notre Dame student, primary majors take 28 hours; supplementary majors take 19 hours. Each of these majors combines formally required courses and electives. The two University requirements (6 credits) are prerequisites for upper-level courses. All courses in the theology major, primary or supplementary, must be 3-credit courses and graded (with the exception of the proseminar).

SUMMARY OF THE PRIMARY MAJOR:
First University requirement (Foundations of Theology): THEO 10001 (first-year) or 10002 (sophomore, junior, senior) or 13183 (University seminar) or 13002 (honors).
THEO 10000 (first year).
Second University requirement (a “development of theology” course): a THEO course listed between 20101 and 29999.
THEO 40201 and 40202—Christian Traditions I and II
THEO 40101 and 40108—Old Testament and New Testament
Electives (15 hours at the upper level; up to 6 may be courses in a classical language)
THEO 43001—Proseminar (1 credit)
Including the University requirements, the primary major thus consists of 34 credit hours.

SUMMARY OF THE SUPPLEMENTARY MAJOR:
First University requirement (Foundations of Theology): THEO 10001 (first-year) or 10002 (sophomore, junior, senior) or 13183 (University seminar) or 13002 (honors).
THEO 10000 (first year).
Second University requirement (a “development of theology” course): a THEO course listed between 20101 and 29999.
THEO 40201 and 40202—Christian Traditions I and II
THEO 40101 or 40108—Old Testament or New Testament
Electives (9 hours at the upper level; up to 6 may be courses in a classical language)
THEO 43001—Proseminar (1 credit)
Including the University requirements, the supplementary major thus consists of 25 credit hours.

WHAT OTHER PROGRAMS ARE OFFERED?
Theology Honors Thesis
The Theology Department offers a special program for particularly gifted undergraduate majors who seek a deeper, more sustained experience in the major through the completion of a thesis project. Each spring semester, the junior class of theology majors will be invited to apply; those selected will be assigned a thesis director from among the faculty of the department. A minimum grade point average of 3.66 within the major is normally expected. Seniors in the Honors Program will enroll in a one-credit Honors Colloquium as well as a two-credit directed reading course in the fall semester, and a three-credit Honors Thesis Writing course in the spring semester, culminating in the submission of a 40–55-page thesis. The Honors Program will normally consist of 37 hours, as compared to 34 hours in the regular primary major. To receive the honors designation on their transcript, students must earn an A– or higher grade on their thesis. A full description of the Theology Honors Program is available on the departmental website (see below for address).

Minor in Theology
The minor is recognized by the University on the student’s transcript. To fulfill requirements for a minor, a student must take 12 credit hours beyond the required 6 hours (for a total of 18 hours). The additional 12 hours must be composed of 3-credit graded courses, which can be taken at the 20xxx or 40xxx level. The minor in theology is accepted by many parochial schools as adequate preparation for secondary school teaching.

Contact information
You may reach the director of undergraduate studies in theology, through the departmental office:
(574) 631-7811
apaglia1@nd.edu
theology.nd.edu/major-minors/
Department of Theology
130 Malloy Hall
University of Notre Dame
Notre Dame, IN 46556-5601

Writing-intensive requirement
THEO 40101 Old Testament and 40108 New Testament have been designated writing-intensive courses by the Department of Theology and fulfill the College of Arts and Letters’ writing-intensive requirement. Students will be expected to work closely with the professor throughout the semester on a significant written project, although specific writing assignments will be designed by the faculty member teaching the course.

PHILOSOPHY AND THEOLOGY JOINT MAJOR
Director:
Director of Undergraduate Studies, Theology
Faculty:
Additional faculty for the joint major are drawn from the Departments of Philosophy and Theology.

Program of Studies. The joint major is intended for undergraduates who are intrigued by philosophical and theological ideas and who have an equal commitment to both disciplines. It seeks to equip such students to handle theology and philosophy adeptly. The major is structured, providing undergraduates with a suitable introduction to the study of both disciplines, but also flexible, granting students considerable scope for the pursuit of their own interests.

The joint major offers the opportunity for an informed investigation of religious and philosophical ideas and should appeal especially to those who intend to pursue graduate work in philosophy or theology.

The joint major incorporates the University requirements in the two departments and most of the formal requirements of the first majors in theology and philosophy. Students in the joint major will take the two-semester sequence in Christian Traditions and an upper-level course in Scripture. The joint major, however, does not require the one-credit proseminar in theology.

Other formal requirements are peculiar to the joint major. Students will study a classical language for two semesters. (For practical as well as pedagogical reasons, this will normally be Greek or Latin.) Majors will also be expected to take on one occasion the joint seminar (offered each spring). Each seminar, led by a theologian and a philosopher, will examine an issue in which the differing approaches of philosophy and theology may prove fruitful. The topic and instructors will change from year to year. Finally, each major will submit a senior thesis prepared under the direction of two advisors, drawn from each department. At the option of the directors, this thesis may be presented and discussed in an informal colloquium consisting of the other students in the joint major.

The remaining courses in the joint major will be at the discretion of the student. Normally taken at the 40xxx level, there should be an equal distribution in the electives between theology and philosophy. However, students may devote up to six hours within the joint major to additional language work. These hours may add to the classical language previously studied, or used to begin another language of significance for philosophical and theological work.

The distinctive features of the joint major should make the program particularly attractive to students preparing for advanced study.
Supplementary Majors, Minors, and Special Programs

Requirements in Philosophy:
PHIL 10101 or 20201, and 20xxx-level course (University-required courses; a higher-level course may be substituted for the latter).
PHIL 30301 and 30302. History of Philosophy I and II.
PHIL 30313. Formal Logic.

Requirements in Theology:
THEO 10001 or 10002 and 20xxx-level course (University-required courses).
THEO 40201 and 40202. Christian Traditions I and II.
THEO 40101 or 40108. Upper-division scripture course.

Plus:
Classical language (normally Greek or Latin)—two semesters.
Joint seminar.
Senior thesis.
18 credit hours of electives (up to six of these may be additional hours in language study).

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting Theology.
Course descriptions can be found by clicking on the subject code and course number in the search results.

Supplementary Majors, Minors, and Special Programs

A supplementary major is one that cannot stand alone in qualifying a student for an undergraduate degree but must be taken in conjunction with a primary major. Several departments offer both majors and supplementary majors. They have been described above. Included below are interdisciplinary nondepartmental supplementary majors and minors.

THE GLYNN FAMILY HONORS PROGRAM

Directors:
Paul Weithman; Christopher Kolda

The Glynn Family Honors Program brings together a small number of outstanding students in the College of Arts and Letters, the College of Science, and School of Architecture. Students are accepted into the Program at the time of admission to Notre Dame. Although selection criteria include the promise of outstanding academic performance as demonstrated by standardized test scores and high school performance, the program is looking for more than mere academic ability. It hopes to identify students with deep intellectual curiosity and interdisciplinary interests.

The Glynn Family Honors Program offers honors sections to fulfill most of the University and college requirements in the students’ first and sophomore years. Courses include the yearlong Honors Seminar (satisfying the writing and literature requirements), Honors Math, Honors Philosophy, Honors Theology, Honors Biology, and Honors Physics.

Since these courses are restricted to honors students, they are smaller than non-honors sections and are usually taught in a seminar format. The instructors for honors sections are chosen from the most outstanding faculty in each college. After the first year, students’ academic work will be centered in their major field of study, but each semester the program offers the opportunity to take elective courses in a variety of subjects. Additionally, honors students take two colloquia focused on senior thesis research during senior year. During the spring of senior year, all students in the Glynn program are required to submit a senior research thesis that reflects at least two semesters’ work under the guidance of a faculty advisor. In Science, the research for this project usually begins sophomore year, and in Arts and Letters during the spring of junior year. While undertaking this research and writing, students work individually under the direction of a faculty advisor.

The generous endowment of the program by John and Barbara Glynn and family, students may apply for available funding for qualified project proposals, including summer research.

In addition to the more narrowly academic features of the honors program, students will be offered various opportunities for broadening personal, cultural, and spiritual growth. Workshops, liturgical events, social gatherings, informal discussions, and cultural excursions are available.

Further information on the structure and content of the Glynn Family Honors Program or on the criteria for admission may be obtained by contacting Prof. Paul Weithman or Prof. Christopher Kolda, 309 O’Shaughnessy Hall, Notre Dame, IN 46556, 574-631-5398; or by visiting our website https://glynnhonors.nd.edu/.

ARTS AND LETTERS PRE-HEALTH STUDIES

Director:
Maureen Gillespie Dawson
Assistant Dean
College of Arts and Letters

Students in the Arts and Letters Pre-Health Program are required to complete an arts and letters primary major in addition to the pre-health profession supplementary major. The APH2 program provides students who intend to pursue a career in medicine or other health professions with an opportunity to complete a major in the College of Arts and Letters while building a firm foundation in the basics of science. Most students elect the APH2 program because they wish to go on to medical or dental school; there are, however, students who intend to pursue other health-related careers or simply prefer the integration of science classes into the arts and letters curriculum. Medical schools encourage prospective applicants to seek a broad, liberal arts education, which enables them to develop skills that will be useful in their career and throughout life. The APH2 program provides students with all of the necessary prerequisites to prepare for the Medical or Dental College Admissions Test and can accommodate the completion of prerequisite courses for other health professions such as physical therapy, physician assistant, nurse practitioner, occupational therapy, pharmacy, veterinary medicine, optometry, osteopathy, and podiatry.

The APH2 major consists of 10 core courses: MATH 10350 & 10360, BIOS 10171 & 10172, and labs, CHEM 10171 & 10172 and labs, CHEM 20273 & 20274 and labs, and PHYS 20210 & 20220 with labs, plus three upper-level science electives (nine credits). Those preparing for programs other than medical school may, with permission from the director, substitute two upper-level science courses for two of the core courses. For premed students Biochemistry (CHEM 40420) is required for the MCAT and the completion of one upper-level biology course (especially Cell Biology [BIOS 30341] or Physiology [BIOS 30344]) prior to the exam is strongly recommended. Students interested in one of the other health professions should choose APH2 electives in light of their prospective graduate program's requirements. CHEM 20204 and PHYS 20140 do not count toward the three upper-level science electives nor do research, special studies, or directed readings. Please note that a student may...
Supplementary Majors, Minors, and Special Programs

use no more than eight credits from AP (Calculus only) toward the APH2 major. Transfer students may transfer a maximum of 24 science credits for APH2; otherwise, credit for science classes taken outside of Notre Dame does not count toward the APH2 major unless specifically approved by the APH2 director.

Students who wish to go to medical/dental school directly after graduation should aim to take the Medical/Dental College Admissions Test in the spring of the junior year.

All curricular advising in reference to the APH2 major is conducted by the APH2 advisor in 104 O’Shaughnessy. The sequencing of courses taken throughout the sophomore, junior, and senior years is worked out by the student in consultation with the APH2 director and the student’s departmental advisor so that the best schedule for each individual is arranged. One possible sequence is the following.

**SAMPLE STUDY PLAN**

### First Year

**First Semester**
- WR 13100, Writing and Rhetoric/ Writing Intensive 3
- MATH 10350, Calculus A 4
- CHEM 10171 and lab, Chemical Principles 4
- Foreign Language 4
- First Philosophy/First Theology 3
- Moreau First Year Experience 1

**Second Semester**
- University Seminar 3
- MATH 10360, Calculus B 4
- CHEM 10172 and lab, Organic Structure & Reactivity 4
- Foreign Language 4
- Arts & Letters Major 3
- Moreau First Year Experience 1

### Sophomore Year

**First Semester**
- College Seminar 3
- BIOS 10171 and lab and module, Biology I 4
- CHEM 20273 and lab, Organic Reactions and Applications 4
- Foreign Language 3
- Arts & Letters Major 3

**Second Semester**
- Arts and Letters Major 3
- BIOS 10172 and lab, Biology II 4
- CHEM 20274 and lab, Chem across the Periodic Table 4
- First Theology/First Philosophy 3
- Foreign Language 3

### Junior Year

**First Semester**
- PHYS 20210 and lab, Physics I 4
- Science Elective 3
- Arts and Letters Major 3
- Elective 3
- Social Science 3

**Second Semester**
- PHYS 20220 and lab, Physics II 4
- Science Elective 3
- Arts and Letters Major 3
- Arts and Letters Major 3
- Literature 3

### Senior Year

**First Semester**
- Science Elective 3
- Arts and Letters Major 3
- Arts and Letters Major 3
- Second Theology/Second Philosophy
  - (Medical Ethics)/CAD 3
  - History 3

**Second Semester**
- Arts and Letters Major 3
- Arts and Letters Major 3
- Second Philosophy/Second Theology
  - Fine Art 3
  - Elective 3

**Notes:**
1. One of these requirements should be a University Seminar.
2. The MCAT includes material in psychology, sociology, and anthropology. Premed students should choose from among those disciplines in fulfilling the social science requirement(s). Introductory Psychology (PSY10000/20000) is highly recommended.
3. The MCAT includes questions on ethics. Premed students should consider fulfilling the second philosophy or theology requirement with a course on ethics.
4. If a student has AP credit for both Calc A & B, Statistics for Life Sciences (ACMS 20340) may be taken to fulfill both an APH2 science elective and the University Quantitative Reasoning requirement.

### IDZIK COMPUTING AND DIGITAL TECHNOLOGIES (CDT) MINOR

**Director**
- Prof. Charles R. Crowell
- 217 O’Shaughnessy Hall
- (574) 276-8581
- ccrowell@nd.edu

**Administrative Assistant**
- Claire Shely
- 217 O’Shaughnessy Hall
- (574) 631-7459
- cdettlin@nd.edu

**Faculty**
The minor in Computational Digital Technologies is interdisciplinary by nature and benefits from the scholarly contributions of a large number of Notre Dame faculty representing an array of academic departments. For an updated list of the faculty affiliated with the minor, please see https://cdt.nd.edu/faculty/

**Program Overview**
The Computing and Digital Technologies (CDT) minor is a blended program cutting across the Colleges of Arts & Letters and Engineering. Key departments in Arts & Letters have partnered with Computer Science & Engineering to offer a unique interdisciplinary minor. Program students will take CDT courses in both colleges to enhance their technical skills and increase their understanding of the ways in which technology can contribute to both personal and professional life. CDT will enrich the liberal arts educations of program students, broaden their perspectives, and give them skills and experience that prospective employers will value tremendously.

**Program requirements**
The Computing and Digital Technologies (CDT) minor requires the following courses:

- A two-semester core course sequence in programming
- A one-credit “Technology as a Profession” seminar,
- Three additional elective courses from one or more of the sub-specialties listed below.

**Required Core Courses**
All program students are required to complete the two semester (fall–spring) core course sequence in the Python programming language. These courses will be offered every year by a faculty member in the Department of Computer Science and Engineering. The core sequence does not assume any prior background in programming and is intended to be an introductory experience for non-engineering students. Ideally, CDT students will complete the core sequences first before taking specialization courses, but that is not generally required.

**Elective Specialty Courses**
The CDT elective courses are organized into six categories reflecting the diversity of disciplines within the College of Arts and Letters along with areas of
technology expertise that are attractive to potential employers. Program students are encouraged to view these categories as sub-specialty tracks within the minor and to gain depth by taking all of their elective courses in a single track. While specialization is not required, students must take at least two (2) courses with computational/digital focus in a track to earn a specialization in that area.

Courses With and Without Computational or Digital Focus
Most CDT courses have a significant computational or digital focus that involves student learning/use of technology. However, some may not, instead providing background information that is highly relevant to the particular specialty in question. In those courses without a computational/digital focus, CDT students are encouraged to take advantage of any project or paper requirements in the class to reflect on how computational methods or technology can be brought to bear on the subject matter of the course. CDT students are limited to only one course without computational/digital focus in any specialization track. If a student earns a specialization in a track with only two courses, both must have a computational/digital focus. Classes with and without computational/digital focus in each track are shown where applicable on the Courses pages.

CDT Specialty Tracks
- **User Interface and Experience.** This track allows students to focus on how technology systems should be designed to enhance and maximize the user experience.
- **Cyber Safety and Security.** This track allows students to focus on the vulnerabilities, threats, protections, investigations and legalities associated with technology systems.
- **Digital Humanities.** This track allows students to focus on the ways in which technology can assist in the analysis and understanding of literature and textual information.
- **Digital Arts.** This track allows students to focus on how technology can assist in the creation and display of artistic expression.
- **Cognitive Science.** This track allows students to focus on the important role technology plays in the growing field of cognitive science.
- **Technology Development and Management.** This track allows students to focus on the ways in which technology solutions can be can developed, implemented, managed, and maintained in organizations.

Requirement Completion Options
To complete CDT, a student must take six (6) courses total including:
- Two (2) core programming courses taken in sequence; and
- The “Technology as a Profession” seminar; and
- Three (3) elective specialty courses taken in one of the following five configurations:

1. Three (3) courses with computational/digital focus in one track (earns track specialization); or
2. Two (2) courses with computational/digital focus in one track and one (1) without computational/digital focus in same track (earns track specialization); or
3. Two (2) courses with computational/digital focus in one track and one (1) without computational/digital focus in another track (earns track specialization); or
4. One (1) course with computational/digital focus in each of three different tracks (does not earn track specialization); or
5. One (1) course with computational/digital focus in each of two different tracks and one (1) without computational/digital focus in any track (does not earn track specialization).

NOTE: Fewer than three (3) specialty courses or fewer than two (2) courses with computational/digital focus will NOT fulfill CDT requirements.

** COURSE DESCRIPTIONS**
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Computing and Digital Technologies (CDT). Course descriptions can be found by clicking on the subject code and course number in the search results. CDT courses and their descriptions also may be found on the CDT website, at the following URL: [http://cdt.nd.edu](http://cdt.nd.edu).

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**DUAL-DEGREE PROGRAM WITH THE COLLEGE OF ENGINEERING**

**Coordinators:**
- College of Engineering
- Michael Ryan
- Assistant Dean
- College of Arts and Letters
- Advising dean for each cohort

**Program of Studies.** The five-year dual degree program between the College of Arts and Letters and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of arts from the College of Arts and Letters and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 1952, offers students the advantages of both a liberal and a technical education. The student completing one of these combination programs has a background in the humanities and social sciences as well as a degree from one of the programs offered by the College of Engineering. Advisors for the program are available for consultation about the advisability of entering the program and about meeting the particular needs of each student pursuing this program.

Qualified students are eligible to receive modest scholarship support from the John J. Reilly Endowed Scholarship program during their third, fourth, and fifth years of study.

The decision to enter the program ideally should be made prior to beginning the sophomore year, although students can also enter the program at a later stage. Three sets of requirements must be met by students in the program: University requirements, Arts and Letters requirements and Engineering requirements, as the following table indicates.

**University Requirements**

<table>
<thead>
<tr>
<th>Courses in the liberal arts:</th>
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</thead>
<tbody>
<tr>
<td>Liberal Arts 1. Quantitative Reasoning</td>
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<tr>
<td>Liberal Arts 2. Science and Technology</td>
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<tr>
<td>Liberal Arts 3. Another Quantitative Reasoning or Science and Technology</td>
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<tr>
<td>Liberal Arts 4. Arts and Literature or Advanced Languages and Cultures</td>
</tr>
<tr>
<td>Liberal Arts 5. History or Social Science</td>
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<tr>
<td>Liberal Arts 6. Integration, or a course from an area not yet chosen in 4 or 5 above</td>
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<tr>
<th>Theology/Philosophy:</th>
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<tbody>
<tr>
<td>Theology</td>
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<tr>
<td>Philosophy/Catholicism and the Disciplines</td>
</tr>
<tr>
<td>The two-semester Moreau First Year Experience</td>
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</tbody>
</table>

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*Please consult the University Requirements section of this Bulletin for details.*
Supplementary Majors, Minors, and Special Programs

<table>
<thead>
<tr>
<th>Arts and Letters Requirements</th>
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</thead>
<tbody>
<tr>
<td>College Seminar</td>
</tr>
<tr>
<td>Literature</td>
</tr>
<tr>
<td>History</td>
</tr>
<tr>
<td>Foreign Language* (1–4 courses)</td>
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<tr>
<td>Fine Arts</td>
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<tr>
<td>Social Science</td>
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<tr>
<td>Major (minimum)</td>
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<table>
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<tr>
<th>Engineering Requirements</th>
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<tbody>
<tr>
<td>CHEM 10171</td>
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<tr>
<td>MATH 10550, 10560, 20550, 20580</td>
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<tr>
<td>PHYS 10310, 10320</td>
</tr>
<tr>
<td>EG 10111, 10112</td>
</tr>
<tr>
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<tr>
<th>Schematic Program of Studies</th>
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<tr>
<td>The exact sequence of courses will vary based on the specific majors selected.</td>
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<tr>
<th>First Semester</th>
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<tr>
<td>WR 13100. Writing and Rhetoric</td>
</tr>
<tr>
<td>Intro to Theology/Philosophy</td>
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<tr>
<td>CHEM 10171. General Chemistry: Fundamental Principles</td>
</tr>
<tr>
<td>EG 10111. Introduction to Engineering Systems I</td>
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<tr>
<td>MATH 10550. Calculus I</td>
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<tr>
<td>Moreau First Year Experience</td>
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<tr>
<td>Total : 18</td>
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<table>
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<tr>
<th>Second Semester</th>
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<tbody>
<tr>
<td>University Seminar</td>
</tr>
<tr>
<td>CHEM 10122. General Chemistry: Biological Processes</td>
</tr>
<tr>
<td>EG 10112. Introduction to Engineering Systems II</td>
</tr>
<tr>
<td>MATH 10560. Calculus II</td>
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<tr>
<td>PHYS 10310. General Physics I</td>
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<td>Moreau First Year Experience</td>
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<tr>
<th>Third Semester</th>
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<tbody>
<tr>
<td>Modern Language</td>
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<tr>
<td>PHYS 10320. General Physics II</td>
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<tr>
<td>MATH 20550. Calculus III</td>
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<td>Engineering Program†</td>
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<td>Engineering ProgramⅡ</td>
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<tr>
<th>Fourth Semester</th>
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<tbody>
<tr>
<td>Theology/Philosophy</td>
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<tr>
<td>College Seminar</td>
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<tr>
<td>Modern Language</td>
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<tr>
<td>MATH 20580. Linear Algebra and Differential Equations</td>
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<tr>
<th>Fifth Semester</th>
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<tr>
<td>History/Social Science</td>
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<tr>
<td>Engineering Program</td>
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<tr>
<td>Arts and Letters Major††</td>
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<tr>
<th>Sixth Semester</th>
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<tbody>
<tr>
<td>Philosophy/Theology</td>
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<td>Engineering Program</td>
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<tr>
<td>Arts and Letters Major††</td>
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<tr>
<td>Arts and Letters Major††</td>
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<th>Seventh Semester</th>
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<tr>
<td>Literature</td>
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<tr>
<td>History/Social Science</td>
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<tr>
<td>Engineering Program</td>
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<td>Arts and Letters Major††</td>
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<tr>
<th>Eighth Semester</th>
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<tr>
<td>Fine Arts</td>
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<td>Engineering Program</td>
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<td>Engineering Program</td>
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<td>Arts and Letters Major††</td>
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<th>Ninth Semester</th>
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<td>Engineering Program</td>
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<td>Engineering Program</td>
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<th>Tenth Semester</th>
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<td>Engineering Program</td>
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<tr>
<td>Engineering Program</td>
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<tr>
<td>Arts and Letters Major††</td>
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<tr>
<td>Arts and Letters Major††</td>
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<tr>
<td>Total : 18</td>
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</tbody>
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* The University Seminar may be selected from an appropriate history, social science, fine arts or literature course, or the first course in theology or philosophy.

** Students who place out of lower level language courses must take at least one language course at the appropriate level.

†† Courses necessary to fulfill the requirements for a major in the student's major arts and letters department.

EDUCATION

Elementary Education
The Notre Dame student taking elementary education at Saint Mary's College must also complete a Notre Dame major along with the University and appropriate college requirements. Those interested in the elementary education program are encouraged to take the prerequisite course, EDU 201, at Saint Mary's in the second semester of their first year of studies. With appropriate planning, and possibly summer-school course work, both the Notre Dame major and elementary teaching certification can be completed in four years.

Secondary Education
(including middle school)
The following Notre Dame majors have been approved for secondary education licensing through the Education Department at Saint Mary's College:

In the College of Science: biology, chemistry, mathematics.

In the College of Arts and Letters: English, languages (French, Spanish, Latin), art, music, social studies (history and political science). Students interested in a secondary license in social studies must also complete additional course work in political science or history (depending on the major) and in one other area: either economics, sociology, or psychology.

In the College of Business: business education.

Notre Dame undergraduates interested in one of the professional teacher education programs should apply to the department the first semester of the sophomore year, but in some cases may start as late as the first semester of the junior year. Students in the College of Arts and Letters, contact education advisor Stuart Greene for more information and help with planning. Students in the College of Science, contact Dr. Kathleen Cannon at 574-631-5812.
Interdisciplinary Minors within the College

During the junior and senior years, students may elect to complete one or more interdepartmental minors in addition to the departmental major sequence. Composed of 15 hours of class work chosen from at least two departments, these minors encourage students to think from an interdisciplinary perspective about a given issue or topic.

Requirements for completion are determined by the faculty director in consultation with the relevant college committee. Current offerings include Catholic Social Tradition; Education, Schooling, and Society; Gender Studies; Hesburgh Program in Public Service; Journalism, Ethics, and Democracy; Latin Studies; Medieval Studies; Peace Studies; Philosophy, Religion and Literature; Philosophy, Politics, and Economics; and Science, Technology, and Values. These were formerly called concentrations and are described in detail below.

CATHOLIC SOCIAL TRADITION

Directors: Bill Purcell (wpurcell@nd.edu/574-631-9473)
Program Assistant: Paula Muhlherr (muhlherr.1@nd.edu/574-631-9402)
Program Website: cstinor.nd.edu

The Minor in Catholic Social Tradition is an interdepartmental minor that serves as a resource for Notre Dame undergraduates to learn Catholicism's social tradition. Catholicism offers a long-standing and profound tradition of thought and teaching that addresses, from a normative standpoint, the full range of social spheres. Such concepts include those of solidarity, the common good, the just wage, human rights, and the free economy, subsidiarity, and the option for the poor.

Sources for the tradition go back as far as the Bible and develop even in the early church fathers. Pope Leo XIII inaugurates Catholicism's effort to bring its social tradition to bear on industrial society in his 1891 encyclical, Rerum Novarum (The Condition of Labor). Since then, popes have drawn upon Rerum Novarum and the social tradition to broaden and develop Leo's set of concerns in encyclicals often titled—as with Pius XII's Quadragesimo Anno, Paul VI's Octogesima Adveniens, and John Paul II's 1991 Centesimus Annus—in accordance with their relationship to the earlier document. In doing so, the popes and the Second Vatican Council have addressed issues ranging across all spheres of social life from the family to the state to the church. The U.S. bishops have made sophisticated application of these teachings to the specific circumstances of the United States.

Unfortunately, many Catholics are unaware of this tradition. Pope John Paul II writes, “It must be asked how many Christians really know and put into practice the principles of the church's social doctrine.” The U.S. bishops concur. While “Catholic social teaching is a central and essential element of our faith,” it is still the case that “our social heritage is unknown by many Catholics.” At the same time, graduates of Notre Dame move on to assume leadership positions, often quite advanced ones, in a broad spectrum of social spheres, including in politics, law, business, education, the media, and the military. The Catholic Social Tradition minor serves as a resource for Notre Dame undergraduates to learn the tradition so that it can inform life both before and after graduation.

The Minor in Catholic Social Tradition involves 15 credit hours of coursework, including a core course (3 credits), two electives (each three credits), three one-credit colloquia/social concerns seminars, and a senior capstone course.

Contact: Bill Purcell at wpurcell@nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Catholic Social Tradition. Course descriptions can be found by clicking on the subject code and course number in the search results.

CONSTITUTIONAL STUDIES

Director: Vincent Phillip Munoz (vmunoz@nd.edu/574-631-0489)
Program Assistant: Jennifer Smith (jsmith70@nd.edu/574-631-5351)
Program Website: constudies.nd.edu

Nothing has done more for justice in the modern world than the development of the rule of law under constitutional principles. But for constitutional governments to secure the common good, thoughtful and educated citizens must possess certain virtues: they must understand and be able to implement, defend, and, if need be, reform constitutional institutions. The Constitutional Studies minor seeks to nurture such citizens, thereby contributing to the University’s mission to pursue truth and to nurture a concern for the common good, that will bear fruit as learning becomes service to justice.

Building on courses across the College of Arts and Letters and the Law School, the Constitutional Studies minor is designed to encourage students to confront fundamental questions concerning justice, the rule of law, and human flourishing. From a variety of historical, cultural, disciplinary, and philosophical perspectives, constitutional studies courses ask questions such as:

- What is the proper relationship between government and civil society, between law and moral principles?
- What are the philosophical foundations of human rights and constitutional democracy?
- What principles of justice can or should lie at the foundation of a constitutional republic?
- What are the proper relationships between church and state and religion and politics, and how do these relationships reflect the more basic relationship between faith and reason?
- What are the moral, social, and political conditions necessary to sustain America’s experiment in constitutional government?
- What is the nature of international law and how are international norms created and maintained?

Constitutional Studies minors receive invitations to participate in extracurricular events associated with the Potenziani Program in Constitutional Studies, the Tompkins Program for Inquiry into Religion and Public Life and the Law School’s Program in Constitutional Structure.

Constitutional Studies Minor Requirements:
The Constitutional Studies Minor requires 15 credit hours of class work. Students must complete core topics in constitutional studies, such as the history and philosophy of constitutional government and human rights and contemporary constitutional issues in America and international law.

- One of the program’s gateway courses:
  - Constitutionalism, Law and Politics I: Constitutional Government & Public Affairs, or
  - CLP II: American Constitutionalism (3 credit hours)
- Three elective courses (total of 9 credit hours)
- Capstone experience (3 credit hours)

The elective courses are grouped into the following clusters:

- Constitutionalism: History and Philosophy
- The American Founding and American Constitutional History
- Comparative Constitutionalism and International Law

These categories focus on the great political and constitutional debates in American and world history and on the underlying principles of constitutional government—natural and civil rights, social contract theory, the market economy, voluntary associations, separation of powers, popular sovereignty, and the rule of law. Elective courses that count for the Constitutional Studies Minor for current and past semesters are listed on the minor’s website (constudies.nd.edu/courses).
Interdisciplinary Minors within the College

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at constudies.nd.edu/courses or at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Constitutional Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

EDUCATION, SCHOOLING, AND SOCIETY
Director:
Nicole McNeil
Associate Director, DUS:
Andrea Christensen

The primary goal of this interdisciplinary minor is to help students acquire diverse perspectives on important questions in education. Education is a complex and challenging aspect of the human experience. It is both an end in itself and a means to many personal, professional, and spiritual goals. Thus, understanding its history and traditions, analyzing its processes, critiquing its goals, and studying its outcomes are of great importance to all of us.

The minor in Education, Schooling, and Society (ESS) uses the tools and resources of a liberal arts perspective to help students reflect on, research, and influence the role of education in society. In addition, the program provides a rich body of resources for students who may want to pursue careers in education after graduation, including teaching, research, working for non-profits, or policy making.

Typically, students apply for admission to the minor late in their freshman year or during their sophomore year. All students are required to meet with the associate director before enrolling.

The ESS minor involves 15 credit hours: the introductory course (ESS 33600, which must be completed by the spring semester of junior year), three electives, and a senior capstone research project.

The capstone project provides students with an opportunity to build upon and extend the work they have completed in fulfilling the requirements for the minor. Students may undertake this in one of three ways: (1) Senior Research Seminar (ESS 43640) in fall semester of senior year; (2) Thesis in ESS (ESS 48100), an independent study completed over the course of senior year (requires approval and 2 credits of research lab); or (3) thesis in the student’s major department that incorporates the study of an educational issue into the research question (requires approval and a second reader from the IIE). Students who choose the third option must take a fourth ESS elective to complete the minor.

The ESS program will accept courses marked as “Univ. Req.” via the online Class Search if they are listed/cross-listed with ESS. The program will not accept CSEM courses for credit but will consider education-related USEM courses on a case-by-case basis. ESS will accept no more than one international course for credit toward the minor.

ESS faculty work closely with students on undergraduate discernment, research, and postgraduate planning (e.g., employment, graduate or professional school, service opportunities).

For more information or to sign up for the minor, contact Andrea Christensen at achrist1@nd.edu.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at ess.nd.edu or at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Education, School and Society. Course descriptions can be found by clicking on the subject code and course number in the search results.

HESBURGH PROGRAM IN PUBLIC SERVICE
Director:
Ricardo Ramirez
Assistant Director:
Claudia Francis
claudia.francis@nd.edu

The Hesburgh Program in Public Service serves students interested in public policy and public service. By preparing students for engaged citizenship, the Program honors the dedicated leadership and public service of the late Rev. Theodore Hesburgh, C.S.C.

The health of American society is closely related to good public policy and ethical leadership. Through an interdisciplinary curriculum in public policy, the Hesburgh Program provides a foundation for students who plan to pursue careers in the public sector, non-profits, or private business and seek to be knowledgeable and effective citizens.

For students in the class of 2021:
The minor consists of 15 credit hours: Introduction to Public Policy, three electives, and a capstone during the junior or senior year. All students take Introduction to Public Policy, preferably early in the program. Elective categories are “values,” “institutions,” and “topics.” Hesburgh minors will take two courses in policy topics and one from either the values or institutions category. The capstone course focuses on practical skills and policy writing. Alternatively, students can elect to do an independent, semester-long capstone project. In addition to these courses, students must also complete three co-requisites: Introduction to American Politics, Introduction to Microeconomics, and a course in Statistics. These requirements will be waived for students that receive University credit for AP tests.

The Hesburgh Program encourages students to pursue summer internships and offers generous support through the Gary Lyman Internship Stipend Awards. Students with internships in public policy and public service may apply for funding twice during their time at the University.

Interested students should meet with the Assistant Director. Students from all colleges and majors are welcome to declare the minor.

For more information contact Claudia Francis at claudia.francis@nd.edu or visit the program’s website, hesburghprogram.nd.edu.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at hesburghprogram.nd.edu/courses or at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Hesburgh Program in Public Service. Course descriptions can be found by clicking on the subject code and course number in the search results.

JOHN W. GALLIVAN PROGRAM IN JOURNALISM, ETHICS, AND DEMOCRACY
Director:
Richard G. Jones

The John W. Gallivan Program in Journalism, Ethics, and Democracy offers several courses for students interested in careers in print, broadcast, online, and multimedia journalism. Begun in 1997 with a grant from the John S. and James L. Knight Foundation and now endowed by the family of John W. Gallivan, this minor combines professional training in journalistic skills with examination of philosophical concerns related to the practice of journalism. For example, what ethical issues arise in preparing a particular story? Or what role does—and should—journalism play in a self-governing society?

The journalism minor requires completion of 15 hours in addition to a student’s major requirements and a news-related internship during either the summer or the academic year. Fundamentals of Journalism is the first, or gateway, class for the program. Other courses that count for the minor...
Interdisciplinary Minors within the College

include The Digital Newsroom; The Craft of Journalism; Advanced Reporting; Sports Media Newsroom; Applied Multimedia for Journalists; Persuasion, Commentary, and Criticism; Broadcast Journalism; and Ethics in Journalism.

The director of the program is Richard G. Jones. An advisory committee of Notre Dame graduates in journalism helps guide the program. Members include Sarah Childress, senior editor and reporter, Frontline; Michael D. (Mickey) Gallivan, former television and wire service journalist and program benefactor; Maddie Hanna, reporter, The Philadelphia Inquirer; Meg Martin, managing editor, Minnesota Public Radio; Sarah Mervosh, reporter, The New York Times; Michelle Krupa and Arlette Saenz, CNN; and Anne Thompson, chief environmental affairs correspondent, NBC News.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Journalism, Ethics & Democracy. Course descriptions can be found by clicking on the subject code and course number in the search results.

LATINO STUDIES

Director:
Luis Ricardo Fraga
Director of Undergraduate Studies:
Karen Richman

Program of Studies

Latino Studies is an interdisciplinary field of academic research and scholarship engaged in understanding the past, present, and future of the youngest and fastest-growing population in the United States. Latinos encompass immigrants from every country in Latin America and the Caribbean as well as those whose ancestors were long ago incorporated during U.S. westward expansion. The supplemental major and minor in Latino Studies engage students with the latest research and analysis on the diverse Latino population in fields such as American studies, anthropology, history, literature, political science, sociology, and theology. Each semester, the Institute for Latino Studies offers approximately fourteen undergraduate courses that range from classroom lectures and seminars to community-based, service-learning courses in the local Latino community of South Bend. ILS also offers annual summer service-learning courses in Chicago, Los Angeles, and Washington, D.C. Students in this three-credit, eight-week summer course will be immersed in community-based and national organizations. They will also engage in critical study related to their service learning in a class led by an ILS professor. To promote full immersion in this service-learning experience, students will not be placed in their home communities.

Supplementary Major

The supplementary major in Latino Studies consists of twenty-four (24) credits: a gateway course (3 credits), capstone/practicum course (3 credits), and eighteen (18) credit hours or the equivalent of six additional Latino Studies courses.

Requirements:

1. Gateway Course (3 credits)

ILS 20701, Introduction to Latinos in American Society. This course examines the Latino experience in the United States, including the historical, cultural, social, economic, political, and religious foundations of the diverse U.S. Latino population.

2. Capstone/Practicum Course (3 credits)

In this 4000-level course, students meet in a seminar-style class and complete a substantial research project (approximately 15–20 pages) based on bibliographic and/or experiential research in Latino Studies.

3. Elective Courses (18 credits)

Students take six more Latino Studies courses as electives chosen in consultation with the ILS Director of Graduate Studies.

4. Senior Thesis Option (3 credits)

A senior thesis in Latino Studies is encouraged, but not required, for students enrolled in the supplementary major. In addition, Glynn Honors Program students enrolled in the Latino Studies program as minors or supplemental majors may also write a senior thesis in Latino Studies. Thesis students take the thesis-writing course in Latino Studies (ILS 48900) under the direction of their thesis faculty supervisor. A minimum grade point average and faculty recommendation are required for acceptance. Students interested in writing a senior thesis should apply to the ILS Director of Undergraduate Studies by the spring of their junior year.

5. Directed Reading Course Option (1–3 credits)

A directed readings course (ILS 46711) allows a student to explore in depth a theme or subject in Latino Studies under the guidance of a faculty member. Directed readings cover material that is not offered as a regular classroom course. Enrollment requires the approval of the Director of Undergraduate Studies.

Summer Service Learning Courses

The Cross-Cultural Leadership Program (CCLP) engages students in real-world applications of their academic studies through summer service learning in Chicago, Los Angeles, and Washington, D.C. Students in this three-credit, eight-week summer course will be immersed in community-based and national organizations. They will also engage in critical study related to their service learning in a class led by an ILS professor. To promote full immersion in this service-learning experience, students will not be placed in their home communities.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Latino Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

LINGUISTICS

Director of Undergraduate Studies:
Maggie Mello

Linguistics, the scientific study of human language, is an investigation into a complex domain of human knowledge. Students of linguistics master a variety of conceptual and empirical techniques that enrich
all of their coursework as well as their careers after graduation.

Because of the field’s inherent interdisciplinary nature, students of linguistics have connections with a wide variety of fields, including neuroscience, literature, anthropology, psychology, philosophy, computer science, English, and other area studies. Some may choose to focus on academic postgraduate studies; others may bring their understanding of human language to careers in information technology, education, translation or interpretation, publishing, dictionary development, legal, medical, or public health, consulting, advertising, government, and various aspects of the arts.

The undergraduate Minor in Linguistics requires completion of five courses and completion of the same language co-requirement as follows:

Co-requirement: evidence of second language learning experience equivalent to 4 semesters of the same second language through coursework and/or placement tests

Requirements (5 Courses / 15 Credit Hours)

Core Course: CSLC 20301. Introduction to Linguistics (3 credits)

Core Course (3 credits):
- ANTH 20204. Fundamentals of Linguistic Anthropology
- ANTH 45842. Doing Things with Words
- PHIL 43902. Philosophy of Language
- PSY 43455/63455. Psycholinguistics
- PSY 43456/63456. Pragmatics of Language Usage

Electives (6 credits): (Core courses not taken to fulfill the core course requirement can be taken as electives)
- ANTH 30400. Language and Culture
- ANTH 35370. New Media
- ANTH 40141. Language and Power
- CSE 40657/60657. Natural Language Processing
- CSLC 20302. Sociolinguistics of Second Language Acquisition
- CSLC 20304. Digital Literacy in Language Learning
- CSLC 30101. Introduction to Second Language Acquisition
- ENGL 40203. Introduction to Old Norse
- ENGL 40211. History of the English Language
- ENGL 40212. Introduction to Old English
- PHIL 30313. Formal Logic
- PHIL 43916. Natural Language Semantics
- PSY 43251/63251. Language Development

Capstone:
- CSLC 48000. Independent Research Practicum (3 credits). Students are required to complete an independent, article-length research paper under the direction of an approved faculty member and overseen by the Director or Assistant Director of the CSLC. During the semester in which students complete this project, they enroll in a 3-credit research practicum. This guides students through the writing process and requires regular updates and presentations on their individual projects. The final paper is graded and signed off on by the approved faculty member.

The Minor in Linguistics is housed in Center for the Study of Languages and Cultures (CSLC). Profiles of the faculty, course descriptions, and additional information about the minor can be found on the CSLC’s website at cslc.nd.edu.

LITURGICAL MUSIC MINISTRY

This 15-credit minor consists of two 3-credit courses in theology and two 3-credit courses in music, plus 3 credits of music lessons or approved ensembles, to be selected in consultation with the student’s music advisor. Contact the director of undergraduate studies in the Department of Theology.

MEDIEVAL STUDIES

The Minor in Medieval Studies allows students who are committed to other programs of study to pursue interests in the culture of the Middle Ages and to cross the limits of individual disciplines as a means of understanding the changing social, economic, legal, intellectual, and artistic systems of medieval society.

Students may declare their intention to undertake a minor in Medieval Studies to the director of undergraduate studies at any time before the end of their third year. The undergraduate director will then act as their minor advisor and help them select a set of courses that form a coherent program of study, often in conjunction with their major if possible. Students are required to take five courses, including the introductory course, The World of the Middle Ages, and three or four electives in Medieval Studies drawn from at least two of the 12 affiliated departments: (Anthropology; Art, Art History, and Design; Classics; English; German and Russian Languages and Literatures; History; Irish Language and Literature; Music; Philosophy; Political Science; Romance Languages and Literatures; and Theology). The Medieval Studies Advanced Seminar (3 credits) is recommended as one of the five courses, in lieu of a medieval elective, on a space-available basis. Courses counted toward a student’s major may not be used for the minor.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Medieval Institute. Course descriptions can be found by clicking on the subject code and course number in the search results.

MUSICAL THEATRE

This interdisciplinary minor is meant to engage the student who has multiple interests in Musical Theatre. Some students will structure their program around singing and acting, but others around song-writing, or work as conductor/impresario, or stage directing, or scholarship, etc. Admission to introductory classes will not be based on performance ability.

5 courses (15 credit hours):
- 3 credits - Musical Theatre History
- 3 credits of course work in FIT courses
- 3 credits of course work in MUSIC
- 3 credits from either FIT or MUSIC, with the Musical Theatre Minor Designation
- 3 credits for a CAPSTONE PROJECT

Current Department of Film, Television, and Theatre courses for the Musical Theatre minor:
- Musical Theatre History (required)
- Musical Theatre Movement/Dance Performance Techniques
- Production and Performance
- The Movie Musical
- Disney in Film and Culture
- Musical Theatre Lab

Current Department of Music courses for the Musical Theatre minor:
- American Popular Song
- Voice Lessons for Non-Majors
- Theory for Non-Majors
- Intro. To Harmony and Voice Leading
- Musicianship I
- Musicianship II
- Musicianship III
- Conducting I
- Opera in Production
- Opera Workshop
- Vocal Pedagogy
- Voice Science

PHILOSOPHY, POLITICS, AND ECONOMICS

The minor in philosophy, politics, and economics (PPE) is designed for students with serious interests at the intersection of political theory, political philosophy, and economic theory. Its aim is to help students acquire some fluency in each of the disciplines, and to provide a forum where all three disciplines can be brought to bear on problems which are common or complementary. PPE emphasizes the development of the analytic skills exercised in close reading, cogent writing and clear oral expression. Students are strongly encouraged to engage in undergraduate research. A high percentage of PPE graduates pursue advanced degrees.

The PPE minor is 15 credits, including the 3-credit Justice Seminar, which is the core course of the minor and is required of all concentrators. The minor is open by application only; any student who wishes to take the Justice Seminar must complete
Interdisciplinary Minors within the College

PHILOSOPHY, RELIGION, AND LITERATURE

Curricular Requirements. The Philosophy, Religion, and Literature minor will require students to complete 15 credit hours of approved course work. These 15 credit hours will normally comprise at least one three-credit Gateway seminar, three three-credit electives, and a three-credit capstone project.

Gateway seminar. Students are required to take a three-credit Gateway seminar, either in philosophy and literature or in religion and literature. The minor is thus organized around two parallel but intersecting tracks. The purpose of the Gateway seminars, whatever their specific topics may be, is to provide a rigorous introduction to the study of philosophy and literature or religion and literature.

Electives. In addition to the Gateway seminar, students are required to take three other courses that have been approved for the minor. The minor’s director will help students identify courses relevant to the minor and to their own individual interests and needs.

Integrating the tracks. Students working primarily in one track are required to take one course in the other. Thus, a student focusing on religion and literature is required to take one course in philosophy and literature. That course may be either the Gateway seminar or another course. If students choose to fulfill this requirement by taking Gateway seminars in both tracks, both seminars will count toward the 15 credit hours needed for the minor.

The capstone project. For the capstone project, each student, working directly with a professor associated with the minor, will write a research essay of approximately 20 pages on a topic that embraces philosophy and literature or religion and literature, or both. Students are encouraged to consult with a professor who is working in a different subject area from the one on which the advisor has expertise. Thus, if a student’s advisor is in Theology, that student will be encouraged to consult with a literature professor who has some interest in the student’s topic. We recognize that some seniors in the College of Arts and Letters are writing senior theses for their majors. In many cases it is unrealistic to expect such students to write an additional capstone essay. Students in the Philosophy, Religion, and Literature minor who are already writing a senior thesis are allowed to complete the minor by taking a fifth elective course instead of the capstone project, provided that the senior thesis topic in some way resonates with the overall themes of the minor.

Events and Activities. The Notre Dame community already hosts a number of lectures, forums, and one-day seminars relevant to the minor. In addition, the minor will sponsor events and activities such as trips to the opera and theater. Students in the minor are required to attend at least three such events.

PHILOSOPHY, SCIENCE, AND MATHEMATICS

This interdisciplinary minor offers students the opportunity to explore the “big questions” raised by science and mathematics. The minor is particularly intended for students who already have significant scientific and/or mathematical training and wish to pursue related philosophical questions which may not be explored by the courses within their major as well as for students outside the sciences, who would like to combine some serious scientific work with intensive discussions of the big questions raised by contemporary science and mathematics.

Students pursuing the minor in Philosophy, Science, and Mathematics take a Core Seminar offered every fall semester which serves as a gateway course to continued studies. In addition, students will take courses in the philosophy of science, the philosophy of mathematics, and logic. Regularly offered courses in these areas include the following:

Philosophy of Science
- PHIL 43704: Science and Social Values
- PHIL 43722: Ethics and Policy in Technology Management
- PHIL 43708: Bio-Medical Ethics, Scientific Evidence & Public Health Risk
- PHIL 30389: Philosophical Issues in Physics
- PHIL 43718: Scientific Images of Humanity
- PHIL 43720: Historical & Conceptual Foundations of Spacetime Theory
- PHIL 43308: Environmental Justice
- PHIL 43711: The Life and Works of Darwin
- PHIL 43721: The Science-Gender Connection
- PHIL 43715: Philosophy of Science and Public Policy

Logic and Philosophy of Mathematics
- PHIL 43907: Intermediate Logic
- PHIL 43918: History and Philosophy of Logic
- PHIL 43906: Philosophy of Mathematics
- PHIL 43913: Modal Logic
- PHIL 43917: Intuitionism
- PHIL 43912: Between Math and Philosophy
- PHIL 43908: Topics in Philosophical Logic: Set Theory

Details about the minor can be found on the Department of Philosophy website at [https://philosophy.nd.edu/majors-minors/philosophy-science-and-mathematics/](https://philosophy.nd.edu/majors-minors/philosophy-science-and-mathematics/).
**Interdisciplinary Minors within the College**

**Science, Technology, and Values**

Program Director:  
Anna Geltzer, Assistant Director  
Reilly Center for Science, Technology & Values

Science and technology play a powerful role in structuring our world, in everything from our physical environment to our culture. A multifaceted understanding of this role is key both for those who aspire to shape our world and for those who want to be successful in it.

The Science, Technology, and Values minor offers students the opportunity to acquire an interdisciplinary understanding of science and technology in modern societies, providing them with analytical and conceptual tools they need to confront the complex questions that arise where science and society intersect.

STV prepares students to pursue a variety of academic and career goals. Students focused on the natural sciences and engineering get to explore the social, political and ethical implications of their chosen fields, while students majoring in business, the humanities and social sciences have an opportunity to study the processes, products and impacts of science and technology.

In addition to our wide selection of interdisciplinary courses, the minor offers opportunities for undergraduate research.

Contact information: The Reilly Center, 453 Geddes Hall, 574-631-5015, ageltzer@nd.edu.

**Course Descriptions**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Science, Technology and Values. Course descriptions can be found by clicking on the subject code and course number in the search results.

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**Teaching English to Speakers of Other Languages (TESOL)**

Director of Undergraduate Studies:  
Maggie Mello

The Minor in TESOL (Teaching English to Speakers of Other Languages) is an interdisciplinary minor designed to instruct students in the essential aspects of linguistics and language education while providing practical experience in classroom management and lesson planning. Courses in TESOL focus on understanding the components of language and the relationship between language and cultural attitudes, values, and practices. Students learn how to teach English by studying second language acquisition theories and teaching methodologies as well as through hands-on teaching during the capstone practicum.

A Minor in TESOL is excellent preparation for professions in teaching ESL/EFL (English as a Second Language/English as a Foreign Language)—both within the United States and in other countries—as well as careers with government agencies and non-profit organizations in international settings. In addition, it has particular value for students who want to pursue graduate work in education, applied linguistics, or theoretical linguistics as well as prospective Peace Corps volunteers, Teach for America applicants, and Fulbright English Teaching Assistants.

**Language Requirement.** To teach and understand the second language acquisition process, students need experience learning a second language. As such, the TESOL Minor requires students to complete 4 semesters of the same second language through coursework and/or testing.

**Coursework.** TESOL courses are structured to give students both theoretical and practical grounding in TESOL. Students study linguistic and pedagogical theories as well as the practical how-tos of teaching.

**Capstone Practicum.** The TESOL Practicum gives students a chance to apply the knowledge that they have gained. Students log 30 hours of teaching and 15 of observation in an actual classroom setting, are observed and evaluated by TESOL professionals, and complete a teaching e-portfolio.

**Required Courses** (18 credit hours)  
CSLC 20301 Introduction to Linguistics  
CSLC 20302 Sociolinguistics of Second Language Acquisition (or CSLC 20304 Digital Literacy in Language Learning) or CSLC 20306 Language, Literacy/ies, and Pedagogy in 21st Century Schooling and Society  
CSLC 20303 Pedagogical English Grammar  
CSLC 30101 Introduction to Second Language Acquisition  
CSLC 30102 Methods in Second Language Teaching  
CSLC 40000 TESOL Practicum

The TESOL Minor is housed in Center for the Study of Languages and Cultures (CSLC). Profiles of the faculty, course descriptions, and additional information about the TESOL Minor can be found on the CSLC’s website at cslc.nd.edu.

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To Table of Contents
Officers of the Administration

SARAH MUSTILLO, Ph.D.
I.A. O'Shaughnessy Dean of the College of Arts and Letters

MARGARET MESERVE, Ph.D.
Associate Dean of the College of Arts and Letters

MARY FLANNERY
Associate Dean of the College of Arts and Letters

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### Advisory Council

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The Mendoza College of Business, an accredited member of the AACSB—Association to Advance Collegiate Schools of Business—was established in 1921.

Notre Dame’s business school is noted for challenging its students to “Grow the Good in Business”, by placing individual integrity at the heart of every decision, by tackling tough problems and building effective organizations, and by harnessing the power of business to serve the greater good of the global community.

Students who are accepted into the Mendoza College of Business through the admissions process (page 22) must matriculate into the college no later than the beginning of sophomore year.

Programs of Study

At the Mendoza College of Business, students should expect challenging academic coursework, an excellent faculty, and many opportunities to interact with corporate executives and industry experts who can immerse them in the realities of today’s business world.

A holistic approach to business education springs from the deepest root of Notre Dame and radiates throughout the curriculum. Education involves more than developing just specialized skills, it involves teaching every student to recognize a role of service to the human community.

The business education program at Notre Dame seeks to expand learning beyond traditional silos and to integrate knowledge across business disciplines, in order to promote critical thought. Students develop the broader perspective they will need to lead in a complex, global economy.

The business world has always required people with initiative, a willingness to take risks and the stamina to strive in a competitive world. To meet demands for new and better goods and services, leaders must manage operations which are extensive and multi-faceted. The business leader whose job it is to put the work of many specialized people together into a smooth-working whole has traditionally developed business skills by rather accidental means: by knowing instinctively, by learning from experience, or by building upon some specialized body of knowledge.

The purpose of the business program is to focus attention directly on the skills and knowledge required by a leader today. The work is especially appropriate at Notre Dame. The responsibility of each business to its employees, customers, suppliers, owners, and the common good is being recognized and studied with growing intensity.

This responsibility raises ethical issues to which Notre Dame and its graduates should respond in a sound and practical way. The continuing effort to improve the practical application of ethical principles to competent performance in leadership roles is a prime concern of the Mendoza College of Business.

In light of the responsibility of the Mendoza College of Business for guiding students toward a liberal education in the Christian tradition and toward future responsibilities as business administrators, the following mission statement has been formulated:

The mission of the Mendoza College of Business is to build a premier Catholic business school that fosters academic excellence, professional effectiveness and personal accountability in a context that strives to be faithful to the ideals of community, human development and individual integrity.

Learning Objectives. The educational objective of the undergraduate program in the Mendoza College of Business is to assist and guide students in preparation for lifelong learning, for effective citizenship and for professional careers as competent and ethical participants in business, government, and other complex organizations. This is accomplished by educating students in the professional area of business while remaining true to the scholarly, liberalizing, and Catholic mission of the college and the University.

The Mendoza College of Business has established the following program learning objectives in support of this mission and objective:

• Be effective problem solvers.
  – Students will gather and analyze relevant evidence to articulate solutions to business problems.
  – Students will analyze business problems in a global context.

• Become effective communicators.
  – Students will produce professional quality business documents.
  – Students will deliver professional quality presentations.
  – Students will work collaboratively to accomplish business objectives.

• Knowledgeable in the field of business.
  – Students will demonstrate foundational knowledge relevant to business.
  – Students will have content knowledge requisite of their academic major.

• Ability to integrate ethics into decision making.
  – Students will evaluate the ethical dimensions of business decisions.
To be eligible for the BBA degree, students must follow a specific curriculum and meet requirements. The college stands ready to accept students who are admitted to Mendoza and have successfully completed the course requirements in the first year as outlined in the University Requirements section of the Bulletin. In addition to these requirements, Mendoza College of Business students should also complete the following specific courses during the first year:

- Calculus
- Statistics for Business
- Principles of Microeconomics
- Principles of Management
- Statistical Inference in Business
- Coding Fundamentals
- Introduction to Business Technology & Analytics
- Introduction to Business Ethics

By the end of the sophomore year, a College of Business student is expected to have completed all the fundamental business courses noted above. The sequence of completion of courses will vary according to the availability of courses. The BBA degree requires a total of 128 credits. Of these credit hours, a student has up to 12 free elective credits and must take at least 18 credits in non-business elective courses. Consequently, a student has considerable flexibility in selecting courses that meet his or her particular academic and career plans. Students in the Mendoza College of Business will declare a major in the spring semester of their first year, in one of the following majors: accountancy, business analytics, business technology, finance, management consulting, or marketing.

The Mendoza College of Business, in partnership with the IDEA Center, also offers an interdisciplinary minor in Innovation and Entrepreneurship to undergraduate students from all colleges and schools. The Accountancy, Finance, and Marketing Departments each offer a minor as well (see below).

Second majors, minors, and concentrations in subject areas outside the College of Business are also available. Students must be able to complete additional majors, minors and concentrations within their four years of study at Notre Dame. Students should refer to specific departments for opportunities and requirements.

To be eligible for the BBA degree, students must complete a minimum of 64 credits at Notre Dame. A graduate from the college must have at least a 2.0 cumulative GPA and have accumulated a minimum number of credit hours in the following areas:

- The following is a breakdown of course and credit requirements to satisfy the 128 BBA degree credits. Refer to the University Requirements section of this Bulletin for an understanding of how courses satisfy the Core Curriculum “Ways of Knowing.”
- Moreau First Year Experience 2
- Writing and Rhetoric* 3
- University Seminar 3
- Quantitative Reasoning* 3–6
- Science and Technology* 3–6
- Arts & Literature or Adv Language & Culture* 3
- History or Social Science* 3
- Integration (or alternate per Univ Req)* 3
- Theology* 6
- Philosophy (or CAD)* 3
- Principles of Microeconomics** 3
- Statistics for Business** 3
- Calculus** 3
- Accountancy I & II 6
- Business Law 3
- Corporate Financial Management 3
- Statistical Inference in Business** 3
- Coding Fundamentals 3
- Introduction to Business Technology Analytics 3
- Principles of Management 3
- Principles of Marketing 3
- Introduction to Business Ethics 1.5
- Macroeconomic Analysis 3
- Managerial Economics** 3
- Foresight in Business and Society 3
- (or Business Problem Solving) 3
- Strategic Management 1.5
- Intro to Process Analytics 1.5
- Major Courses*** 19.5–21
- Non-business electives ≥18
- Free Electives**** varies

*Other Writing-Intensive Course if AP for Writing & Rhetoric
*May also satisfy University Seminar
**May satisfy Univ. Req. if not AP
***A minimum GPA of 2.000 is required in the major
****Will vary depending on applied AP credit


General administration of the undergraduate program is accomplished in the Office of Undergraduate Studies, Room 101 Mendoza College of Business. Advisors are available in this office to counsel students and answer questions concerning university and college requirements/policies. Faculty mentoring for juniors and seniors is available from their respective major departments; however, Room 101 advisors will continue to provide general advice on college and university issues. The department offices of the college, (e.g. Accountancy; Finance; Information Technology, Analytics, and Operations; Management and Organization; and Marketing) are located in Room 102 of the Mendoza College of Business. In addition to the University pre-law advisor, Mendoza College offers pre-law advising to current undergraduate business students.

Normal semester course load for sophomores is 15–17 hours; for juniors and seniors, 15–19 hours. The minimum semester course load for all students is 12 hours. Normally, a cumulative and recent term grade point average of 3.4 or higher is required to obtain permission to carry an overload. Interested students should contact the Office of Undergraduate Studies for specific information.

Students may elect to fill free elective or non-business elective requirements to include 1-, 1.5-, or 2-credit-hour courses, AP credit, or Credit by Exam. The college accepts a maximum of 32 credits through AP and/or credit by exam, including no more than six credits through AP and/or credit by exam in any one language, toward degree-seeking credits. AP credit cannot be applied toward University core curriculum requirements in the degree.

A maximum of three credit hours of workshops, service, activity or experiential learning from the following types of voluntary courses can be applied as free elective credit toward the 128 degree credits:

- Band (Marching, concert and Jazz)
- Orchestra
- Chorale
- Glee Club
- Liturgical Choir
- Folk Choir
- Music Lessons and Ensembles
- Ballet and Dance
- Debate
- Theater Experience/Film Society
- Social Concerns Seminar
- FYS Introductory (FYS 10XXX)
- Peer Advising
- Internships (Special Studies)

Exceptions may be made if required for a second major. If students complete more than three credit hours of these courses, they will still appear on a student's transcript, but the extra credits will not count toward the degree requirements.

Pass-Fail. With permission from their academic advisor and approval of the assistant dean, juniors and seniors may elect one course per semester under the pass-fail option. Only free elective and non-business elective courses may be taken pass-fail. No business courses, required courses, or courses in a student's second major or minor (other than the first course taken in a minor track) may be taken pass-fail even though taken as a free elective. The selection of a course as pass-fail must be made during the first six days of the semester and is irrevocable. Note: to be eligible for Dean's List status, a student must have a minimum of 12 graded credits for the semester.
Directed readings or special studies are not part of a standard curriculum for students in the Mendoza College of Business and cannot duplicate or substitute for an existing course. Directed readings or special studies are rare exceptions to established coursework, designed to support an area of research or study that is of mutual interest to a faculty member and a student. These courses contain advanced objectives beyond those covered in regularly scheduled courses—not introductory material or material taken from the popular literature that should more properly be considered “self-improvement” than academic in nature. A directed reading/special studies course will not satisfy a University, College, or major requirement. Directed readings or special studies outside of a student's major in business may count as free elective or non-business elective credit only. A student may register for no more than three credit hours of directed readings or special studies in any given semester. No more than a maximum of nine directed reading or special studies credit hours may be applied toward the 128-credit-hour BBA degree requirements.

Study Abroad

Students from any of the majors in the Mendoza College of Business may participate in study abroad programs.

Notre Dame has made it possible for students to earn credits toward graduation in study abroad programs. Travel, direct personal experience of another language and culture, and study in another tradition of business education prepares students for the opportunities and challenges awaiting them. The International Business Certificate substantiates a student's acquisition of knowledge and perspective in the varying aspects of our ever-evolving global economy. The multi-disciplinary aspect of the course selections enhances the student's ability to communicate and engage in the international arena with a greater appreciation of diverse commerce, cultural, and social contexts.

While a semester or summer of international study is encouraged and may be helpful in completing the certificate requirements, the certificate may be earned by taking courses on the main campus.

A total of five courses and fifteen credits are required from among a variety of offerings from the Mendoza College of Business, the College of Arts and Letters and other national and international institutions:

- one course (3 credits) must be in a foreign language at the intermediate level with the LANG attribute;
- two courses (6 credits) must be selected from among the international business course offerings with the IBC Business (IBCB) attribute; and the remaining two courses (6 credits) must be selected from among contemporary international liberal arts courses with the IBC Liberal Arts (IBCL) attribute or from courses with the IBCB attribute.

Students must indicate their intention to complete the program via the Mendoza College of Business website no later than the end of their junior year. Once a student's intent to pursue the Collegiate Sequence in International Business has been indicated, the Graduation Progress System will include an International Business Certificate section so as to assist in tracking progress toward completion of the requirements.

Courses for the International Business Certificate may not be taken on a pass/fail basis. Courses may “double count” toward other University or major requirements.

For more information, contact the Mendoza College of Business Office of Undergraduate Studies.

Collegiate Sequence in International Business

The Collegiate Sequence in International Business consists of courses which offer Mendoza College undergraduates a broad exposure to the global nature of the world of business. Completion of the program is acknowledged with an International Business Certificate at graduation. While not a major or minor, this program enriches the student's academic preparedness to take advantage of the multitude of opportunities and challenges awaiting them. The International Business Certificate substantiates a student's acquisition of knowledge and perspective in the varying aspects of our ever-evolving global economy. The multi-disciplinary aspect of the course selections enhances the student's ability to communicate and engage in the international arena with a greater appreciation of diverse commerce, cultural, and social contexts.

While a semester or summer of international study is encouraged and may be helpful in completing the certificate requirements, the certificate may be earned by taking courses on the main campus.

A total of five courses and fifteen credits are required from among a variety of offerings from the Mendoza College of Business, the College of Arts and Letters and other national and international institutions:

- one course (3 credits) must be in a foreign language at the intermediate level with the LANG attribute;
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Courses for the International Business Certificate may not be taken on a pass/fail basis. Courses may “double count” toward other University or major requirements.

For more information, contact the Mendoza College of Business Office of Undergraduate Studies.

Student Awards and Prizes

College Level Awards

The Doughnutter Award. This award is given to the graduate whose leadership has contributed most significantly to the progress of the college.

Eugene D. Fanning Award. Given to a senior man and woman who demonstrate exceptional achievement in business communication; excellence in writing, speaking, listening, and interpersonal communication; and who demonstrate leadership potential, initiative, integrity, and respect for the dignity and rights of others.

The Hamilton Awards. Founded by Robert L. Hamilton '34, Racine, Wis., these awards are given to the outstanding senior in each of the five departments of the college.

The Charles G. Morrow Award for Business Excellence. This award was established by the five children of the late Charles G. Morrow, Class of 1938, in honor of his contributions to Notre Dame and the business community. Given to a graduating senior in the Mendoza College of Business, this award recognizes business excellence through documented service, leadership, and personal integrity.

Accountancy Awards

Accountancy Chairman Award. An annual award provided to an accountancy senior who demonstrates outstanding service to the Department of Accountancy.

The Accountancy Faculty Award. This award recognizes an outstanding senior in the Department of Accountancy in the Mendoza College of Business. It is given to an outstanding senior with one of the highest cumulative grade point averages.

The William Barth Award. This award is given to the graduate who has accepted a full-time volunteer experience after they leave Notre Dame or who plan to work for a not-for-profit organization.

Peter Brady Award. Established to honor past faculty member Peter Brady, this award is given in recognition of outstanding academic performance.

Accountancy Excellence Awards. Given annually to up to 25 sophomores who declare accountancy as their major and have demonstrated outstanding economic achievement. The awards are funded by annual gifts from Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers.

Elmer Layden Awards. Given annually to graduating accountancy seniors in recognition of academic achievement. The awards are funded by the Elmer Layden Jr. Endowed Fund.

Brother Cyprian Awards. Given annually to graduating accountancy seniors in recognition of academic achievement. The awards are granted in honor of Holy Cross Brother Cyprian O’Hare.
marketing major with the highest grade point average in marketing courses. The award is named for the first chairman of the Department of Marketing, Wesley C. Bender.

Yuusaku Furuhashi Award, in honor of an esteemed colleague who was a pioneer in the area of international marketing. The award will be given on a calendar year basis to a student who, in the estimation of the faculty, writes the best essay capturing the marketing insights gained by the semester abroad experience. The winner each year may be either a junior or senior, depending upon the dates spent overseas.

Paul D. Gilbert Award for Leadership. An annual award given to a marketing senior for overall leadership in extracurricular departmental activities. The recipient is selected by the faculty of the Department of Marketing.

John R. Malone Award. An annual award given to the junior marketing major with the highest overall grade point average.

The Robert M. Satterfield Award. An annual award given to a senior marketing student for bringing enthusiasm, integrity and spirit of teamwork to the classroom.

Business Awards

Students’ academic organizations are supported and encouraged by the administration and the faculty. These associations are actively managed by student officers. Members of the faculty serve in advisory capacities.

Honorary Societies.
Beta Gamma Sigma. The mission of the International Honor Society Beta Gamma Sigma is to encourage and honor academic achievement in the study of business, to cultivate and celebrate leadership and professional excellence, to advance the values of the Society, and to serve its lifelong members. Undergraduate membership in this organization is restricted to the upper 10 percent or less of the senior class and the upper 5 percent or less of the junior class for full-time students. Faculty membership is limited to those with tenure in the Mendoza College of Business at Notre Dame.

Beta Alpha Psi. Accountancy majors who have demonstrated outstanding scholastic ability and the personal characteristics requisite to professional status are eligible for membership in Beta Alpha Psi, the national professional and honorary accounting society. The purposes of this society are to encourage and foster the ideal of service as the basis of the accounting profession; to promote the study of accountancy and its highest ethical standards; to act as a medium between professional persons, instructors, students and others who are interested in the development of the study or profession of accountancy; to develop high moral, scholastic, and professional attainments in its members; and to encourage cordial interaction among its members and the profession generally.

American Advertising Federation Chapter. The purpose of the ACND is to provide and promote a better understanding of the functions of advertising and of its values, to stimulate and encourage advertising professionalism through advertising education, career exploration in advertising, to follow and understand the trends of the advertising industry, to develop the individual abilities of its members, and to ultimately possess a better understanding of the advertising industry as a whole.

Asia Pacific Business Club. The purpose of APBC is to provide the Notre Dame community with a platform to share knowledge about business in Asia Pacific, explore career opportunities in Asia Pacific and other regions, and support long-term relationships among its members, ND alumni, and Asian business leaders.

Association of Latino Professionals in Finance and Accounting (ALPFA). ALPFA is the premier business organization for expanding opportunities for Latino leadership in the global market. At Notre Dame this organization is designed to provide networking, career building, and leadership opportunities to diverse students who intend to major in accounting, finance or information technology management. ALPFA also provides scholarships, internships and other career advancing opportunities to diverse students.

Business Action in Social Entrepreneurship (BASEND). The purpose of BASEND is to build a firm business foundation for our members and partners through solving real business problems for local and global non- and for-profits; to create positive social change for the community; and to provide career resources and mentorship to members.

Corporate Finance Club of Notre Dame. The primary purpose of this organization is to advocate the corporate finance industry and assist members in networking, personal branding, and the interviewing process to obtain internships and full-time employment. The club shall seek to supplement the classroom education of members and broaden their awareness of the financial world’s theories, principles, and practices.

Entrepreneurship Society of Notre Dame. The purpose of the Entrepreneurship Society of Notre Dame is to foster the entrepreneurial spirit and ability of Notre Dame undergraduate students through coordinating programs which emphasize entrepreneurship. The mission of the club is to coordinate guest speakers throughout the year, to devise new and creative ways to raise money while providing real experience in starting new ventures, and to provide resources for any student interested in starting a new venture but lacking the resources necessary.
Information Technology Management Club, Notre Dame (ITMND). The purpose of ITMND is to pool the resources of all persons interested in the field of Information Technology Management (ITM) to more fully develop the academic, career, and social potential of all individuals in this dynamic field of study.

Investment Club of Notre Dame du Lac. The club was established to serve as an opportunity for all undergraduate students who are interested in the field of investments to develop and/or increase their knowledge of this special area of finance through activities designed as rewarding educational experiences.

Marketing Club. The purpose of the University of Notre Dame Marketing Club is to provide a medium for the interaction of all those interested in marketing. The club strives to go one step beyond the classroom in terms of learning what marketing truly constitutes by organizing speakers, field trips, and social interaction between students and faculty. It is a resource for connecting the students throughout their education in and out of the classroom.

MoneyThinkND. MoneyThinkND seeks to promote financial literacy by placing college mentors in South Bend high schools to teach personal finance lessons. The goal is to help build the financial health of Americans by equipping youth and young adults to believe in themselves, navigate the financial decisions of adulthood, and achieve financial independence.

National Association of Black Accountants (NaBa). The Student Chapter of NaBa of Notre Dame shall unite through membership accounting students who have similar interests and ideals, are committed to academic and future professional excellence, have a sense of professional and civic responsibility, and are concerned with enhancing opportunities for minorities in the accounting profession.

Wall Street Club. Through a network of current students and alumni, we provide resources and mentoring for ND students who wish to learn about careers on Wall Street. The club works closely with the Investment Office, Career Center, alumni, and senior mentors to help students network, learn about opportunities, and prepare for a successful career on Wall Street.

Smart Women Securities at Notre Dame. Smart Women Securities at Notre Dame seeks to provide undergraduate women with the tools they need to become financially independent and knowledgeable about their investments.

By working on an investment project, our goal is to foster an environment in which members develop personal aspirations along with collaborative skills and a business foundation that inspires confidence to participate in the financial world.

Students Consulting for Nonprofit Organizations Notre Dame. The mission of SCNOND is to develop the South Bend community through pro-bono consulting engagements with local nonprofit organizations through the unique experiences and gain academic knowledge of our student members. The secondary mission of SCNOND is to develop our student members for future career endeavors through consulting projects with nonprofit organizations.

Student International Business Council (SIBC). The SIBC seeks to fulfill its vision of “Peace through Commerce” by interacting with global companies and organizations, while educating its members and the Notre Dame community on the different aspects of international business. The council encourages students from all majors and interests to become active members of the organization to work on semester projects with the hope of bringing a variety of perspectives to issues regarding international business and economics.

Undergraduate Women in Business (UWIB). The Undergraduate Women in Business Club is committed to the development of women's roles as students of business and as leaders in business-related fields. The club is designed to build a stronger sense of community among undergraduate women to aspire to business-related professions through events, including an annual professional development conference, highlighting the many opportunities available to them.

Unleashed. We believe that educating individuals early in life about the importance of impact investing will encourage continuous involvement and contribution to all related fields. Unleashed is an organization for people from all disciplines, and intends to collaborate with other universities and colleges to learn from each other's experiences. Our members are challenged to think in new ways and explore alternative financial solutions to existing social issues.

Accountancy

Deloitte Foundation Accountancy Department Chair: Sandra C. Vera-Muñoz
Deloitte and Touche Professor of Accountancy: Brad A. Badertscher
Notre Dame Alumni Professor of Accountancy: Peter D. Easton
Vincent and Rose Lizzadro Professor of Accountancy: Hal White

Associate Professors: Kenneth W. Milani; H. Fred Mittelstaedt; Ramachandran Ramanan; James L. Wittenbach

Associate Professors: Jeffrey J. Burks; Stéphanie Larocque; Chao-Shin Liu; Asis Martínez-Jerez; Jeffrey S. Miller; James A. Seida; Thomas L. Stober; Sandra C. Vera-Muñoz

Assistant Professors: Erik L. Beardsley; John B. Donovan; Andrew J. Imdieke; Zach Kowaleski; Jessica Watkins

Teaching Professors: Laura L. Hollis; Edward F. Hums; Brian R. Levey; Michael J. Meyer; Tonia H. Murphy; James A. O’Brien

Associate Teaching Professors: Elizabeth Chorvat; Colleen M. Creighton; Janet L. O’Tousa; Samuel Ranzilla; William J. Schmuhl (emeritus); Keith Uretz

Program Objectives. The AACSB separately-accredited Department of Accountancy provides outstanding accounting educational experiences for its students by (a) complementing and supporting the tradition of liberal arts/general education at Notre Dame, (b) adhering to the objectives of the undergraduate program of the Mendoza College of Business, and (c) developing and continuously improving an innovative accounting curriculum for successful careers as accounting professionals and business leaders. The curriculum focuses on critical thinking/analysis, research, professionalism, teamwork, and communication.

The department provides students with the skills and knowledge necessary to succeed in accounting-related careers. The department also supports the activities of the Meruelo Family Center for Career Development by (a) maintaining an outstanding record of placing high percentages of graduates with international accounting firms and other large organizations such as Accenture, Bain, Delta Airlines, Deutsche Bank, Grant Thornton, and GE, among others; and (b) supporting student desires to pursue other graduate options, including graduate education and volunteer work.

Major Program of Studies. The accounting major sequence begins with Accountancy I and II (ACC 20100 and 20200). These courses, normally taken in the freshman or sophomore year and required of all business students, are designed to provide a broad introduction to accounting concepts, the profession of accounting and the role of accounting in society.
Students choosing the accountancy major must complete the following Department of Accountancy requirements.

ACCT 30110. Accounting Measurement and Disclosure I
ACCT 30120. Accounting Measurement and Disclosure II
ACCT 30210. Strategic Cost Management
ACCT 30280. Data Analytics in Accounting
ACCT 40510. Audit and Assurance Services
ACCT 40610. Federal Taxation
MGTO 30320. Business Communications

**The 150-Hour Rule for CPA Certification.** Typically, 150 hours of college credit with an accounting concentration are necessary to be licensed as a CPA. The rules vary across states. Most students meet the 150-hour requirements through AP credit and overloads during their four-year undergraduate degree. Notre Dame also offers a one-year Master of Science in Accountancy program to help our students meet the 150-hour requirement as well as other state-specific course requirements. Students can earn the BBA and MSA degrees in 4½ years (9 semesters).

**Minor Program of Studies.** The accounting minor sequence, available to non-Business majors, begins with Accountancy I and II (ACCT 20100 and 20200). These courses are designed to expose students to a broad introduction of accounting concepts, the profession of accountancy, and the role of accounting in society. Students must also complete Measurement and Disclosure I (ACCT 30110) and two additional accounting courses from the following menu:

ACCT 30120. Measurement and Disclosure II
ACCT 30210. Strategic Cost Management
ACCT 30280. Data Analytics in Accounting
ACCT 40510. Audit and Assurance Services
ACCT 40610. Federal Taxation

The minor is designed to enhance skills obtained in the student’s major and broaden career opportunities.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Accountancy. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Finance**

*William and Casie Daley Department Chair and Professor of Finance*
Robert Battalio
*University of Notre Dame Chair in Finance:*
Zhi Da
*Martin J. Gillen Dean and Bernard J. Hank Professor of Finance:*
Martijn Cremers
*Kenneth R. Meyer Professor of Global Investment Management:*
Roger Huang
*C.R. Smith Professor of Finance:*
Timothy Loughran
*John W. and Maude Clarke Professor of Finance:*
Paul Schultz
*Professors:*
Jeffrey Bergstrand; Shane Corwin; Pengjie Gao; Bill McDonald
*Notas Professorship for Excellence in Undergraduate Instruction and Teaching Professor:*
Carl Ackermann
*Teaching Professor and the Associate Dean for Executive Education:*
Walter Clements
*Teaching Professors:*
Margaret Forster; David Hutchison
*Associate Professors:*
Benjamin Golez; Sophie Shive; D. Katherine Spiess
*Associate Teaching Professor and Academic Director, Master of Science in Finance:*
Gianna Bern
*Associate Teaching Professor and Associate Dean for Specialized Masters Programs:*
Kristen Collett-Schmit
*Associate Teaching Professor and Associate Dean for Undergraduate Education:*
Jim Leady
*Associate Teaching Professor:*
Colin Jones; John Silver
*Assistant Professors:*
Huaichi Chen; Peter Kelly; Johnathan Loudis; Ben Matthews; John Shim; Jun Yang; Rafael Zambrana
*Assistant Teaching Professor, Assistant Department Chair, and Director of Undergraduate Studies:*
Jason Reed
*Visiting Assistant Teaching Professor:*
Amy Shout

*Program Objectives.*** The department offers courses with the dual objective of (1) equipping students with the solid base of knowledge and skills necessary for entry into the financial world and (2) providing a broad foundation so that students can pursue further study at the graduate level.

*Program of Study.*** All students enrolled in the Mendoza College of Business are required to take an introductory finance course during their first or second year; this course provides an overview of issues encountered by a firm’s financial manager.

Finance majors must complete FIN 20150 Corporate Financial Management with a grade of C or higher. This course cannot be repeated for a higher grade. All business students are also required to complete two courses in business economics: FIN 30210 Managerial Economics and FIN 30220 Macroeconomic Analysis. The aim of these courses is to provide students with an understanding of the economic environment within which business enterprises operate.

In addition to the courses required of all candidates for the degree of bachelor of business administration, finance majors are required to take seven courses offered by the department. The three required courses are FIN 30100 Financial Statement Analysis (or ACCT 30100 Corporate Financial Reporting), FIN 30400 Advanced Corporate Finance, and FIN 30600 Investment Theory. Students interested in pursuing a career in corporate finance or CPA certification are encouraged to take the two-course sequence ACCT 30110 & 30120 in place of FIN 30100 or ACCT 30100. Finance majors choose any four 40000-level finance electives from the specialized courses offered by the department.

The finance elective courses are designed to equip students with the knowledge to progress in whatever area of business they choose upon graduation. The subject matter in these courses—investments, corporate finance, financial markets, financial institutions, and real estate—can be tailored to meet the student’s individual interests. Graduates of the department are currently pursuing successful careers in many areas of business, including investment banking, consulting, commercial banking, and corporate financial management, among others.

Students who intend to take the examinations leading to the Chartered Financial Analyst (CFA) designation should structure their programs with that objective in mind. An additional business law class (ACCT 40710) should be included in their program, along with appropriate courses in accounting and investments.

**Real Estate Minor**

Students interested in real estate should consider pursuing the Minor in Real Estate that is offered through a partnership between the Finance Department and Notre Dame’s Fitzgerald Institute for Real Estate. This interdisciplinary minor, which is open to all university undergraduates, provides an opportunity to study real estate using tools from multiple disciplines, including business, finance, architecture, engineering, and the social sciences. The program’s 15 required credit hours consist of the introductory course, Real Estate Fundamentals (FIN 30700), 9 credit hours in real estate electives offered across multiple colleges, and two 1.5-credit colloquia that will expose students to academic and industry perspectives on a range of topics, from real estate finance and private equity to real estate development and construction. Applications for the minor open each spring. For more information please visit realestate.nd.edu.

To Table of Contents
Information Technology, Analytics, and Operations

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found at the department’s website https://mendoza.nd.edu/research-faculty/academic-departments/finance/finance-undergraduate-courses/ as well as the Registrar’s class search tools available through insideND.

Information Technology, Analytics, and Operations

John W. Berry Sr. Department Chair and Professor:
Robert F. Easley
Edward Frederick Sorin Society Professor of ITAO:
Ken Kelley
Joe & Jane Giovannini Professor of ITAO:
Ahmed Abbasi
Fred V. Duda Professor of Business:
Sarv Devaraj
Professors:
Corey Angst; Hong Guo; Kirsten Martin; Daewon Sun
Associate Professors:
Nicholas Berente; Nasir Ghiaseddin; Jerry C. Wei; Xuying Zhao
Assistant Professors:
Krista Foster; John Lalor; Shawn Qu; Sriram Somanchi; Yoonseock Son; Katie Wowak; Zifeng Zhao
Teaching Professor:
Michael Chapple
Associate Teaching Professors:
Huy Huynh; Robert Lewandowski; Scott Nestler; Jennifer Waddell
Assistant Teaching Professors:
Martin Barron; Seth Berry; Xiaojing Duan; Brandon Erfacher; Sharif Nijim; Frederick Nwanganga
Research Assistant Professors:
Josephine Akosa; Francis Bilson Darku; David Dobolyi

Programs of Study.
The IT, Analytics, and Operations Department offers two majors, one in Business Technology and one in Business Analytics.

BUSINESS TECHNOLOGY MAJOR
The Business Technology major is designed to prepare students to become leaders in the use of technology for the benefit of organizations and society. This program of study focuses on educating students about the development and use of information systems as decision-making and problem-solving tools. The program also is intended to develop an understanding of the managerial issues encountered in the introduction or operation of IT solutions in organizations, particularly, how these tools can be used to gain a competitive edge and to re-engineer an organization.

BTEC Major Required Courses
ITAO 30150. Data Storytelling 1.5 hrs.
ITAO 30230. Data Management 1.5 hrs.
ITAO 30620. Strategic Business Technology 1.5 hrs.
ITAO 30640. Privacy and Security 3.0 hrs.
ITAO 30660. Project Management 1.5 hrs.
Complete 6 additional credits from:
ITAO 30610. Application Development 3.0 hrs

BUSINESS ANALYTICS MAJOR
The Business Analytics major will prepare students to conceive of the right kinds of questions that can be addressed using the massive datasets accumulating in firms and other repositories. Students will learn how to formulate the best research plan to answer those questions, and to use cutting-edge tools and techniques to execute those plans. The curriculum includes coursework on: data management, data mining, predictive analytics, machine learning, visualization, unstructured data, text mining, and other analytic techniques. Students with these skills will be in high demand in all disciplines, including HR, marketing, finance, accounting, IT, and consulting, as well as across a wide variety of firms.

BAN Required Courses
ITAO 30210. Data Analysis with Python 1.5 hrs.
ITAO 30220. Predictive Analytics 3.0 hrs.
ITAO 30230. Data Management 1.5 hrs.
ITAO 40150. Quantitative Decision Modeling 1.5 hrs.
ITAO 40250. Unstructured Data Analytics 1.5 hrs.
ITAO 40420. Machine Learning 1.5 hrs.
ITAO 40510. Ethics of Data Analytics 1.5 hrs.
[ITAO 30150. Data Storytelling 1.5 hrs.
and ITAO 30240. Data Visualization 1.5 hrs.]
or
ITAO 30240. Data Visualization 1.5 hrs.
ITAO 30160. Conveying Visual Data Insights 3.0 hrs.
Complete 6 additional credits from:
ITAO 30620. Strategic Business Technology 1.5 hrs.
ITAO 40430. Social Media Analytics 1.5 hrs.
ITAO 40520. Sports Analytics 1.5 hrs.
ITAO 40550. Data Acquisition 1.5 hrs.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found at mendoza.nd.edu/ITAO. Click on Academics in the left menu to explore course descriptions for both majors.
Management and Organization

Professor, and Rev. Basil Moreau, C.S.C.
Department Chair:
Craig Crossland
Teaching Professor, Director of Undergraduate Studies, and Assistant Department Chair:
Wendy Angst
Franklin D. Schurz Professor of Management:
Jason A. Colquitt
Ray and Milani Segfried Professor of Entrepreneurship:
Dean A. Shepherd
David E. Gallo Professor of Business Ethics:
Ann E. Tenbrunsel
Professor:
J. Michael Crant
Associate Professors:
Viva O. Bartkus; Michael Mannon; Cindy Muir; Oliver Williams; Adam Wowak
Assistant Professors:
John Buesnbark; Timothy Hubbard; Charlice Hurst; Brittany Solomon
Research Professor:
Matthew C. Bloom
Assistant Research Professor:
Manuela Casti Yeagley
Teaching Professor, and the Cathy and John Martin Associate Provost for Innovation:
Bryan Ritchie
Teaching Professors:
Joseph Holt; James S. O’Rourke IV
Associate Teaching Professor, and the Rex and Alice Martin Executive Director of the Notre Dame DeBakey Center for Ethical Leadership:
Christopher Adkins
Associate Teaching Professor, and the St. Andre Bassette Assistant Professor:
Mary J. O’Neil Director of the Fanning Center for Business Communication:
Amanda Casti
Associate Teaching Professor, the Arthur E. and Mary J. O’ Neil Director of the Fanning Center for Business Communication:
Angela Logan
Associate Teaching Professor, and the Arthur E. and Mary J. O’ Neil Director of the Fanning Center for Business Communication:
Amanda McKendree
Associate Teaching Professors:
Chad Harms; Jessica McMannus Warnell; John Michel; Samuel Miller; Gerard Pannekoek
Assistant Teaching Professor, and Academic Director of the Master of Science in Management Program:
Kristopher Muir
Assistant Teaching Professor:
Timothy Balko; Jennifer Cronin; Kelly Rube; Christopher Stevens

Programs of Study
The Department of Management & Organization offers both an undergraduate major in Management Consulting, and a minor in Innovation and Entrepreneurship.

MANAGEMENT CONSULTING MAJOR
The consulting program prepares students to lead people and processes within both large and small organizations or to advise organizations on those management issues. A particular emphasis is placed on managing within organizations facing the challenges of rapid change and increased competition. The major is designed to provide sufficient flexibility for students to prepare for several career paths by preparing students to think systematically about the processes through which organizations achieve excellence.

Consulting Major Required Courses
MGTO 30620. Business Communications 1.5 hrs.

Note: Consulting majors are required to take MGTO 30300: Business Problem Solving to fulfill the college-level requirement of either MGTO 30110 (Fore sight in Business & Society) or MGTO 30300 (Business Problem Solving)

Choose three of the following six Information Technology courses:
ITAO 30150. Data Storytelling 1.5 hrs.
ITAO 30230. Data Management 1.5 hrs.
ITAO 30240. Data Exploration & Visualization 1.5 hrs.
ITAO 30620. Strategic IT 1.5 hrs.
ITAO 30660. Project Management 1.5 hrs.
ITAO 40150. Quantitative Decision Modeling 1.5 hrs.

In addition to the courses listed above, all consulting majors must take any five of the following six Management courses:
MGTO 30100. Strategic Human Res. Mgt. 3.0 hrs.
MGTO 30200. Management Competencies 3.0 hrs.
MGTO 30310. Innovation & Design Thinking 3.0 hrs.
MGTO 30320. International Management 3.0 hrs.
MGTO 40720. Values-Based Leadership 3.0 hrs.

INNOVATION AND ENTREPRENEURSHIP MINOR
The Mendoza College of Business, in partnership with the IDEA center, offers an interdisciplinary minor in Innovation and Entrepreneurship to undergraduate students from all colleges and schools. Through unique, immersive learning experiences, the minor helps students build the entrepreneurial confidence needed to identify emerging opportunities and lead the launch of new ventures. The minor provides students with a high-impact capstone experience in areas such as new venture startup, entrepreneurial finance, or social entrepreneurship. Students who combine a minor in Innovation and Entrepreneurship with one of the traditional majors can find employment via starting a new venture or in corporate areas of research and development, new product development, strategic planning and venture capital investing.

Entrepreneurship Minor Courses

Required Courses (6 credits)
MGTO 30500. Intro. to Entrepreneurship 3.0 hrs.
MGTO 30310. Innovation & Design Thinking (or equivalent) 3.0 hrs.

Elective Courses (select 6 credits)
MGTO 31315. Designing Your Life 1.5 hrs.
MGTO 30510. Social Entrepreneurship 3.0 hrs.
MGTO 30520. Funding New Ventures 1.5 hrs.
MGTO 30540. Imagination, Creativity & Commerce 3.0 hrs.
MGTO 40510. Legal Issues in Entrepreneurship 1.5 hrs.
MGTO 40520. Entrepreneurial Sales & Sales Management 1.5 hrs.
MGTO 41500 1 & E Lab 3.0 hrs.

*Additional electives may be added throughout the year. Please check with your advisor.

Capstone Course
MGTO 40550. New Venture Creation 3.0 hrs.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found at the department's website: mendoza.nd.edu/research-and-faculty/academic-departments/management-organization/ as well as on the Registrar's class search tools available through insideND.

Marketing

John Cardinal O'Hara C.S.C. Professor of Business and Department Chair:
Shankar Ganesan
Raymond W. and Kenneth G. Herrick Professor of Marketing:
John F. Sherry, Jr.
Aloysius and Eleanor Nathe Professor of Marketing Strategy:
William L. Wilkie
John T. Ryan Jr. Chair in Business Ethics and Professor of International Ethics:
Jim Otteson
Professor:
Joel E. Urban
Assistant Professors:
John F. Gaski; Frank A. Germann
Assistant Professors:
Yixing Chen; Emily N. Garbinski; Christian E. Hughes; Vamsi K. Kanuri; Mitchell C. Olsen; James E.B. Wilkie; Joonhyuk Yang
Teaching Professor, Director of Undergraduate Studies, and Assistant Department Chair:
Joseph Cherian
Teaching Professor:
Timothy Bohling
Associate Teaching Professor:
Robert Essig

Program of Study: The Department of Marketing offers an undergraduate major in Marketing, and a minor in Digital Marketing.

Marketing Major
Students completing a degree in marketing at Notre Dame should: (1) understand the decision-making processes of buyers and sellers in a market; (2) comprehend the role and impact of marketing in society; (3) apply behavioral models and quantitative tools to the analysis of marketing issues; (4) develop informed marketing strategies; (5) work effectively in
a team environment; and (6) respond to the ethical and social responsibilities of marketing practitioners.

All students in the Mendoza College of Business take Principles of Marketing (MARK 20100) in their freshman or sophomore year. Students who choose marketing as a major must take Consumer and Organizational Buyer Behavior (MARK 30100), Marketing Research (MARK 30120), and five additional marketing electives. Students majoring in marketing may elect to pursue one of four tracks: (1) Marketing Decision Analytics to focus on marketing models and data analytics; (2) Brandscaping to focus on brand strategy, marketing communications, creativity and culture; (3) Consulting and Market Development to focus on consulting, customer solutions, and sales management; and (4) Digital Marketing to focus on digital, social media marketing and customer engagement. Each track consists of three elective courses. Students may pursue any of the four tracks to develop depth and select electives from other tracks or general electives to develop breadth in the marketing domain. Students are not required to pursue any of these tracks and are free to choose electives consistent with their academic interests. More information is available on the Marketing Department website (http://mendoza.nd.edu/research-faculty/academic-departments/marketing/)

The marketing major prepares students for a wide range of opportunities in leading public and private business organizations. Marketing majors are also recruited by non-profit organizations such as educational or art institutions, charitable organizations, and hospitals. The Marketing Decision Analytics track prepares students for careers in marketing and data analysis, marketing research and retail analysis. The Brandscaping track helps students for careers in brand management, advertising, media planning. The Consulting and Market Development track prepares students for careers in consulting, retail account management, market development, and sales management in Business-to-Business (B2B) and Business-to-Consumer (B2C) firms. The Digital Marketing track prepares students for careers in social media marketing, digital marketing, mobile and online marketing.

Digital Marketing Minor – Restricted to Non-Mendoza students

The Marketing Department offers a minor in Digital Marketing to non-Mendoza students. The minor provides students with strong exposure to the rapidly growing field of digital marketing. The minor focuses on social media marketing, customer engagement using online and mobile platforms, and a broad understanding of the digital domain and various application areas. Some of the employment opportunities include social media analyst, digital content specialist, digital marketing consultant and digital marketing analyst.

Required courses (15 credits)

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>MDMK 20100</td>
<td>Principles of Marketing</td>
<td>3.0 hrs</td>
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<tr>
<td>MDMK 30100</td>
<td>Consumer and Organizational Buyer Behavior OR</td>
<td>3.0 hrs</td>
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<tr>
<td>MDMK 30120</td>
<td>Marketing Research</td>
<td>3.0 hrs</td>
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<td>MDMK 30460</td>
<td>Social Media Marketing</td>
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<td>MDMK 30470</td>
<td>Digital Marketing</td>
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<tr>
<td>MDMK 40650</td>
<td>Managing Online and Mobile Customer Engagement</td>
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**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Marketing. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Non-Departmental Courses**

Assistant Dean for Undergraduate Studies: Dale M. Nees, Mendoza College of Business

Many courses in the college are designed to cross departmental lines and provide basic tools during the sophomore and junior years or to foster the integration of various disciplines during the junior and senior years. These courses are open to all business students with appropriate prerequisites.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- Business Administration - Business Law
- Business Administration - AL
- Business Administration - EG
- Business Administration - SC
- Business Administration - UG

Course descriptions can be found by clicking on the subject code and course number in the search results.
<table>
<thead>
<tr>
<th>Name</th>
<th>City, State</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARK A. ALEXANDER</td>
<td>Montville, New Jersey</td>
</tr>
<tr>
<td>WILLIAM P. ANGRICK</td>
<td>Bethesda, Maryland</td>
</tr>
<tr>
<td>JAMES G. BERGES</td>
<td>New York, New York</td>
</tr>
<tr>
<td>ROBERT M. BERTINO JR.</td>
<td>Dallas, Texas</td>
</tr>
<tr>
<td>EDWARD C. COPPOLA JR.</td>
<td>Dallas, Texas</td>
</tr>
<tr>
<td>JOSEPH F. COYNE</td>
<td>Los Angeles, California</td>
</tr>
<tr>
<td>JEROME J. CROWLEY JR.</td>
<td>Los Altos, California</td>
</tr>
<tr>
<td>DINO CUSUMANO</td>
<td>New York, New York</td>
</tr>
<tr>
<td>PERRY N. DELLELCE</td>
<td>Toronto, Ontario</td>
</tr>
<tr>
<td>MATTHEW S. DESALVO</td>
<td>Riverside, Connecticut</td>
</tr>
<tr>
<td>MAURICE J. DEWALD</td>
<td>Newport Beach, California</td>
</tr>
<tr>
<td>THOMAS P. DOLPHIN</td>
<td>Minneapolis, Minnesota</td>
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<tr>
<td>ROBERT E. DOWDELL</td>
<td>Laguna Beach, California</td>
</tr>
<tr>
<td>JOSE RAFAEL FERNANDEZ</td>
<td>San Juan, Puerto Rico</td>
</tr>
<tr>
<td>JAY M. FERRIERO</td>
<td>McLean, Virginia</td>
</tr>
<tr>
<td>CHARLES K. FISHER JR.</td>
<td>Fort Worth, Texas</td>
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<tr>
<td>WARD J. FITZGERALD</td>
<td>Conshohocken, Pennsylvania</td>
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<tr>
<td>LOIS K. FOLGER</td>
<td>Midland, Texas</td>
</tr>
<tr>
<td>CYRUS E. FREIDHEIM JR.</td>
<td>North Palm Beach, Florida</td>
</tr>
<tr>
<td>BRIAN P. GALLAGHER</td>
<td>Chicago, Illinois</td>
</tr>
<tr>
<td>GARY R. GARRABRANT</td>
<td>New York, New York</td>
</tr>
<tr>
<td>ROBERTO GARZA DELGADO</td>
<td>Guadalupe, Mexico</td>
</tr>
<tr>
<td>JOHN C. GERSPACH</td>
<td>Scarsdale, New York</td>
</tr>
<tr>
<td>JOSEPH E. GIOVANINI</td>
<td>Highlands Ranch, Colorado</td>
</tr>
<tr>
<td>CHRISTINA L. GLORIOSO</td>
<td>New York, New York</td>
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<tr>
<td>TIMOTHY M. GRAY</td>
<td>Minneapolis, Minnesota</td>
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<td>THOMAS E. GROJEAN SR.</td>
<td>Los Angeles, California</td>
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<td>KATHLEEN C. GUBANICH</td>
<td>Valley Forge, Pennsylvania</td>
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<td>JOE M. HAGGAR III</td>
<td>Dallas, Texas</td>
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<td>WILLIAM J. HANK</td>
<td>Westmont, Illinois</td>
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<td>JAMES L. HESBURGH</td>
<td>Notre Dame, Indiana</td>
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<td>DANIEL R. HESSE</td>
<td>Kansas City, Missouri</td>
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<td>RICHARD J. HUETHER</td>
<td>Schenectady, New York</td>
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<td>JAMES M. JAEGEGER</td>
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<td>GARY R. KANEB</td>
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<td>TIMOTHY J. KENESEY</td>
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<td>FRANK A. POTENZIANI</td>
<td>Rancho Santa Fe, California</td>
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<td>MARK H. RAUENHORST</td>
<td>Minnetonka, Minnesota</td>
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<td>PAUL C. REILLY</td>
<td>St. Petersburg, Florida</td>
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Advisory Council
College of Engineering

The College of Engineering was established as a distinct unit of the University in 1897, although a program in civil engineering was offered in 1873. The college comprises five departments: aerospace and mechanical engineering, chemical and biomolecular engineering, civil and environmental engineering and earth sciences, computer science and engineering, and electrical engineering.

Since its inception, the College of Engineering has regarded the primary purpose of all higher education as the development of the intellect, discriminatory power, and judgment in all students to enable them to arrive at sound decisions in their personal lives and in the professional lives they will pursue after graduation. The programs of studies offered in the various departments of the college are, therefore, constructed to give the student a good knowledge of the basic sciences and engineering principles, and to prepare the student for the manifold duties of an educated professional and for the cultural life of an educated person. Classroom instruction is amplified by laboratory work and design experiences that give the student insight into the application of principles to practical problems. Detailed information about the College of Engineering and its many programs can be found at engineering.nd.edu.

Engineering at Notre Dame combines technical inquiry with a creative bent (novel methods of using and producing materials, components, devices, and systems) to develop innovations that can improve the health, well-being, and quality of life for all persons. Consistent with the University's Catholic mission and heritage, the College of Engineering's mission is founded on the principle that the creation and transfer of knowledge should reflect a profound and complete respect for the dignity of all persons and for the greater common good of humanity. To appropriate the words of the University's founder, Rev. Edward A. Sorin, C.S.C., the college must be, first and foremost, a force for good in the world.

To that end, the college will continue to engage in transformational research in its core competencies—energy, biomedical/bioengineering, environmental science/engineering, and national/personal security—as they address the important needs of humanity, while inspiring students of all levels to scholarship and service. It will also continue to develop its expertise in electronic materials and devices, wireless and information systems, natural hazard mitigation, flow physics and control, geochemistry and geosciences, hydrology, and computational science and engineering, translating research outcomes into commercial ventures as possible, so that the efforts of Notre Dame engineering researchers produce the greatest good for society.

Accreditation and Academic Association. The College of Engineering is a member of the American Society for Engineering Education. All engineering bachelor degree programs are accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The computer science bachelor degree program is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org.

Registration of Engineers. Registration of engineers is required for many fields of practice. Recent graduates need not acquire registration immediately upon graduation, but they benefit by applying early for the required state examination. Graduating from accredited programs such as those offered by Notre Dame facilitates registration as a professional engineer.

Programs and Degrees

The College of Engineering offers curricula leading to the undergraduate degrees listed below:

- B.S. in aerospace engineering
- B.S. in chemical engineering
- B.S. in civil engineering
- B.S. in computer engineering
- B.S. in computer science
- B.S. in electrical engineering
- B.S. in environmental earth sciences
- B.S. in environmental engineering
- B.S. in mechanical engineering

To complete all degree requirements, the student must take and pass all of the courses specified in the Bulletin for the given degree and must earn the total minimum number of course credit hours specified for the degree.

To obtain two undergraduate degrees from the College of Engineering, a student must successfully carry out an approved program of courses totaling no less than 157 credit hours, depending on the programs. These must include all of the courses specified in the Bulletin for each degree.

The college offers advanced degrees in the following areas:

- M.S. in aerospace engineering
- M.S. in bioengineering
- M.S. in chemical engineering
- M.S. in civil engineering
- M.S. in computer science and engineering
- M.S. in electrical engineering
- M.S. in environmental engineering
- M.S. in geological sciences
- M.S. in mechanical engineering
- Ph.D. in aerospace and mechanical engineering
- Ph.D. in bioengineering
- Ph.D. in chemical engineering
- Ph.D. in civil engineering and geological sciences
- Ph.D. in computer science and engineering
- Ph.D. in electrical engineering

The Department of Aerospace and Mechanical Engineering also offers a non-thesis master of engineering (M.E.) in mechanical engineering.

The details of the programs and the engineering courses offered at the graduate level are in the Graduate School Bulletin of Information.

Engineering Common Core. All engineering curricula consist of each of the following:

- University Core Curriculum. Students enrolled in the College of Engineering must satisfy all University Core Curriculum requirements as detailed below:

  - Six courses in the liberal arts
    - 1. Quantitative Reasoning
    - 2. Science and Technology
    - 3. An additional course in Quantitative Reasoning or Science and Technology
    - 4. Arts and Literature or Advanced Languages and Cultures
    - 5. History or Social Science
    - 6. Integration, or a course from an area not yet chosen in 4 or 5

  - Four courses exploring explicitly Catholic dimensions of the liberal arts
    - 1. A foundational Theology course
    - 2. A developmental Theology course
    - 3. A Philosophy course
    - 4. An additional Philosophy course or a Catholicism and the Disciplines course

  - Two courses in writing
    - 1. A University Seminar
    - 2. A Writing and Rhetoric course, or another writing-intensive course

  - The University Core courses and requirements are fully detailed and explained in the First Year of Studies section on page 37 of this Bulletin.
  - A Notre Dame course taken to satisfy a Common Core requirement can also be used to satisfy a Basic Science or Basic Engineering core requirement.

- Basic Science Core: 27 credit hours. MATH 10550 Calculus I; MATH 10560 Calculus II; MATH 20550 Calculus III, MATH 20580 Introduction to Linear Algebra and Differential Equations; CHEM 10171 General Chemistry: Fundamental Principles; PHYS 10310 General Physics I; PHYS 10320 General Physics II.

- Basic Engineering Core: 6 credit hours. EG 10114 Engineering Discernment (1 cr.), EG 10115 Engineering Projects (2 cr.) (a suitable department...
First Year of Studies. A first-year student enters Notre Dame for one academic year of basic collegiate studies before choosing a department within the college. In the spring of their first year, a student intending to major in engineering will select a degree program.

A first-year student intending to pursue any of the College of Engineering degree programs should, as a minimum, complete the following courses by the end of the first year:

**First Semester**
- WR 13100. Writing and Rhetoric 3
- MATH 10550. Calculus I 4
- CHEM 10171. General Chemistry: Fundamental Principles* 4
- EG 10111. Introduction to Engineering Systems I 3
- University Curriculum Course† 3
- Moreau First Year Experience 1

**Second Semester**
- University Seminar+ 3
- MATH 10560. Calculus II 4
- CHEM 10122. General Chemistry: Biological Processes or other technical course* 3
- PHYS 10310. General Physics I 4
- EG 10112. Introduction to Engineering Systems II 3
- Moreau First Year Experience 1

**Total: 18 credits**

* The College requires CHEM 10171 or CHEM 10181 for all students. Aerospace, environmental and mechanical engineering all require a second chemistry class, either CHEM 10122, CHEM 10172 or CHEM 10182. Chemical engineering students must take either CHEM 10122, CHEM 40420 or another approved advanced chemistry course. CHEM 10122 will satisfy a technical elective requirement in all other degree programs, and is strongly recommended for students pursuing the bioengineering minor or any bio-focused concentration within a degree program.

† See University Core Curriculum above.

The Moreau First Year Experience

First-year students are required to complete a two semester course sequence for the Moreau First Year Experience.

Engineering Business Practice. The college recognizes the importance of providing its graduates with opportunities to learn how engineers function in the world of business and offers a multi-course sequence (EG 40421/40422) that provides education in this area. Students in all majors of the college may take at least the first course to satisfy technical elective requirements. The courses increase the effectiveness of engineering graduates by developing an understanding of the dynamics of business operations. They include issues related to ethics, leadership, and business practices such as marketing, management, finance, and human resources, and they examine the professional and leadership characteristics of modern industrial leaders. In the second course, students develop a business plan and execute it using a computer simulation program.

Combination Five-Year Programs with the College of Arts and Letters. The college recognizes the benefits of a broad background in cultural, social, and technical subjects and, in 1952, in cooperation with the College of Arts and Letters of the University, instituted a five-year program that combines the liberal arts program with the requirements of the various engineering programs. Students who complete this combination program will earn two degrees: the degree of bachelor of arts and the degree of bachelor of science in the engineering major pursued. Dual-degree students are eligible to join the Reilly Program in Engineering and Arts and Letters described at http://reilly.nd.edu/reilly-dual-degree-in-arts-and-letters-and-engineering/.

International Study Opportunities. There are semester- or year-long opportunities during the academic year for juniors in Dublin, Ireland; London, England; Perth, Australia; Puebla, Mexico; Cairo, Egypt; and Santiago, Chile. The programs in Mexico and Chile require the student to be fluent in Spanish. In each location, students must take at least two technical courses to remain on track for graduation. Programs vary by semester, and not all locations are appropriate for every major in the college. Students should contact a department adviser to work out any details.

The college currently offers summer programs for engineering undergraduates who have completed at least the first-year engineering curriculum, in London, England; Alocy, Spain; Dublin, Ireland; Berlin, Germany; and Rome, Italy.

Admission to all programs is competitive and requires demonstration of satisfactory academic performance.
Combination Five-Year Program with the Mendoza College of Business. To address the needs of engineering students who wish to integrate management and engineering, the College of Engineering and the Mendoza College of Business have established a program in which a student may earn the bachelor of science degree from the College of Engineering and the master of business administration from the Mendoza College of Business (there is no program where a student can earn dual undergraduate degrees from the College of EG and Mendoza College of Business).

The program is structured so that a student who has completed the first three years of the bachelor’s degree program, if accepted through a competitive admissions process, completes the master of business administration and the bachelor of science in engineering by the end of the fifth year. This program may require summer or intersession work.

Students who wish to pursue this program should have a superior scholastic record in their undergraduate program and must apply to and be accepted by the MBA program during their third year in the College of Engineering.

The general sequence of courses in the five-year engineering-MBA program may be found under “Dual Degree Programs” later in this section of the Bulletin.

Combination Five-Year Program with Saint Mary’s College. Students at Saint Mary’s College may elect to earn a B.S. in biology, chemistry, or mathematics from Saint Mary’s while simultaneously earning a B.S. in a related engineering program at Notre Dame. This program requires five years of study, with only the fifth year at Notre Dame to satisfy residency requirements. Students interested in this program must consult the appropriate advisor(s) at Saint Mary’s College before enrolling in required courses at Notre Dame.

Through a special arrangement, students at Saint Mary’s College, Notre Dame, Ind., may take a combination program of science classes at Saint Mary’s and engineering classes at Notre Dame beginning in their sophomore year at Saint Mary’s. The student will earn her bachelor of science degree from Saint Mary’s at the end of the fourth year, and complete her bachelor of science in engineering degree in her fifth year at Notre Dame.

Combination Five-Year Programs with Other Schools. The highly desirable objective to infuse more liberal arts and sciences work into the education of engineering students has also been met also through 3-2 engineering programs with select liberal arts institutions.

The University of Notre Dame has entered into agreements with Assumption College, Worcester, Mass.; Bethel College, Mishawaka, Ind.; Carroll College, Helena, Mont.; Elon University, Elon, N.C.; Franciscan University, Steubenville, Ohio; Goshen College, Goshen, Ind.; Kings College, Wilkes-Barre, Penn.; Loyola University Chicago, Chicago, Ill.; Saint Anselm College, Manchester, N.H.; Stonehill College, Easton, Mass.; University of St. Thomas, St. Paul, Minn.; University of St. Thomas, Houston, Tex.; Xavier University of Louisiana, New Orleans, La., and the Atlanta University Center, comprising Morehouse College, Spelman College and Clark Atlanta University in Atlanta, Ga., whereby the liberal arts and sciences part of a combination five-year program is given by these respective colleges and the engineering part by Notre Dame. In these dual-degree programs, the student spends three years at a college of first choice and two years at Notre Dame. After completion of the five-year program, the student receives a bachelor of arts or bachelor of science degree from the first college and a bachelor of science in engineering degree from Notre Dame.

The sequence of courses for any of these programs will vary depending on the program of study at the other institution. No attempt has been made to set up a rigid pattern, and each participating institution has some freedom concerning the choice and arrangement of courses, provided that the coverage in the areas of mathematics, physics, chemistry, computing, introductory engineering, theology, philosophy, history, social science, and literature or fine arts is appropriate. It is expected, however, that students will complete the equivalent of the first two years of the desired College of Engineering program before applying for transfer.

To be eligible for an undergraduate degree, the student must complete a minimum of 62 credit hours at the University with a minimum of 75% of the degree credit hours (not less than 90 credit hours) earned after high school graduation through college and university courses, and be enrolled in the last semester on the main university campus. Please consult the Undergraduate Academic Code for further details.

Details of these programs may be obtained by writing to the institutions concerned or to the College of Engineering.

Graduate Programs in Engineering.* The Graduate School of the University of Notre Dame comprises four divisions: humanities, social science, science, and engineering. The division of engineering was organized in 1946 with power to grant advanced degrees in the departments of aerospace and mechanical engineering, chemical and biomolecular engineering, civil and environmental engineering and earth sciences, computer science and engineering, and electrical engineering. The general conduct of graduate work is under the jurisdiction of the Graduate Council of the University, the members of which serve as specified in the Academic Articles. Director of the program in the engineering division is the dean of the College of Engineering.

* Reference should be made to the Graduate School Bulletin of Information for details of these programs and to the Web at http://graduateschool.nd.edu/departments-and-programs/degree-programs-by-division/

MINORS

The College of Engineering offers six minors, open to all University students who have taken the appropriate pre-requisite courses for upper-level engineering and science courses. For students in the College of Engineering, at least one, and up to two course(s) required for the minor may double-count towards degree requirements and the minor. The department who manages the minor should be consulted for the rules. Students in other colleges should consult their own program department for similar restrictions.

Bioengineering

This minor, offered by the Department of Aerospace and Mechanical Engineering and the Department of Chemical and Biomolecular Engineering, comprises a six-course sequence that teaches students how to use the tools of engineering analysis with the fundamentals of the engineering and life sciences, to enliven the understanding of living organisms, medical treatments and biochemical pathways and to provide quantitative predictions and insight towards the design of medical and biological devices and processes. The six-course minor consists of three foundational courses in bioengineering, cell biology and more advanced courses in the biology field, along with three courses specializing in areas such as biomaterials, biomechanics, biotransport/microdevices, tissue engineering and biomaterials, molecular and cellular bioengineering, bioinformatics, biomedical imaging and treatment, and environmental bioactivity and remediation. Students intending to pursue this minor should take CHEM 10122 prior to starting the minor. Details are provided at ame.nd.edu/undergrad-programs/minors-and-concentrations.

Computational Engineering

This minor, offered by the Department of Aerospace and Mechanical Engineering, recognizes the importance of computational tools in all disciplines of engineering and gives students exposure to the fundamentals of programming and numerical methods, experience and skills in computer usage, and knowledge of applications from a range different areas. The minor requires fifteen credit-hours (nominally five courses) selected from among a list available at ame.nd.edu/undergrad-programs/minors-and-concentrations.

Energy Engineering

This minor, offered by the Department of Aerospace and Mechanical Engineering, recognizes that Energy is an important subject of current interest that involves many engineering and non-engineering disciplines, and enables students to develop a stronger background in and to prepare better for professional


**College Awards and Prizes**

**COLLEGE OF ENGINEERING AWARDS**

*The Rev. Thomas A. Steiner Prize.* From a fund established in 1948 by former students of Rev. Thomas A. Steiner, C.S.C., former dean of the College of Engineering, a cash award is made to seniors in the college who have been selected for their all-around excellence as students.

*The Reilly Scholar Designation.* The designation of Reilly Scholar is given annually to those fifth-year seniors enrolled in the dual Engineering/Arts and Letters program who have excelled academically and otherwise during their first four years as students.

*The Americo Darin Prize.* From a fund set up by the Darin family in their father’s name, a cash award is made to several engineering juniors who have demonstrated exceptional and steady improvement over their first four semesters at Notre Dame.

**Departmental Awards**

**AEROSPACE AND MECHANICAL ENGINEERING**

*Patrick J. Deviny Award.* Presented each year to a junior aerospace student who has displayed the most diligence and persistence in the pursuit of undergraduate studies in aerospace engineering.

*Vincent P. Goddard Design Award.* Presented each year to a senior in aerospace engineering for outstanding performance in the aerospace design course.

*Sigma Gamma Tau Honor Award.* Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

*Pi Tau Sigma Honor Award.* Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

*The Aero Propulsion Award.* Presented each year to a senior in aerospace engineering for outstanding performance in the Gas Turbine and Propulsion class.

*The Zahm Prize for Aeronautical Engineering* was founded in 1946 by Dr. Albert J. Zahm, distinguished pioneer in aeronautics and at one time professor of physics at the University of Notre Dame. The award is made to the senior aerospace engineering student who, in the estimation of the faculty of the program, has achieved the most distinguished record in professional subjects.

*The Zahm Prize for Mechanical Engineering.* Beginning with 2007–08 year, awarded to a senior mechanical major who, in estimations of the faculty,
has achieved the most distinguished record in professional subject.

Jerome L. Novotny Design Award. Presented each year to a junior in mechanical engineering for the best design in the junior heat transfer course.

The Rockwell Automation Power Systems Design Award. Presented each year to seniors in mechanical engineering for the best design in the senior mechanical engineering design course.

Best Undergraduate Research Paper. Presented each semester to the undergraduate who has written the best research paper based on research done during undergraduate research class for the semester.

CHEMICAL AND BIOMOLECULAR ENGINEERING

American Institute of Chemists Award. Presented to an outstanding senior in the Department of Chemical and Biomolecular Engineering.

Chemical Engineering Alumni Award. Presented to one or more seniors who have an outstanding combination of scholarship and extracurricular activities.

Chemical Engineering Faculty Award. Presented to the senior with the highest scholastic average after seven semesters of study.

Chemical Engineering Research Award. Presented to one or more undergraduate students who have performed outstanding undergraduate research.

James P. Kohn Scholarship in Chemical Engineering. A fund dedicated to helping meet the financial need of top performing seniors.

John C. Tracy Award. Presented to the student with the highest score in thermodynamics.

CIVIL AND ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

The American Society of Civil Engineers Activity Award. The Indiana section each year presents an award to the two senior students most active in the student chapter of ASCE.

Lesta D. Graves Academic Improvement Award. Presented to a senior civil engineering student for significant development in academic performance.

The Sydney Keyser Outstanding Scholar Award. Presented to a senior civil engineering student for excellence and creativity in academics.

The Kenneth R. Lauer Award. Presented to a senior civil engineering student for leadership, integrity, and service to fellow students and community as determined by that student’s classmates.

James A. McCarthy Scholarship in Civil Engineering. Presented to a junior civil engineering student for outstanding academic and professional excellence.

The Walter L. Shilts Award for Undergraduate Achievement. Presented to a senior civil engineering student who has best fulfilled his or her potential as a student through hard work and dedication to obtaining the best possible education.

The Rev. Alexander Kirsch, C.S.C., Award. To the senior receiving a degree in geological sciences who has evidenced high qualities of personal character, scholarship, and leadership.

Dr. Raymond C. Gutzick Award. To the graduating senior who has demonstrated the most promise in geological research as evidenced by a successful research project.

COMPUTER SCIENCE AND ENGINEERING

Outstanding Computer Engineering Award. To the graduating senior in computer engineering who has evidenced high qualities of personal character, scholarship, and leadership.

Outstanding Computer Science Award. To the graduating senior in computer science who has evidenced high qualities of personal character, scholarship, and leadership.

ELECTRICAL ENGINEERING

The James L. Massey Award. For achievement in electrical engineering, recalling communication theory, undergraduate teaching, and the Binary Examination.

The Basil R. Myers Award. For achievement in electrical engineering, recalling circuit theory, the English language, and St. George Day at Notre Dame.

The Arthur J. Quigley Award. For achievement in electrical engineering, recalling communication theory, undergraduate teaching, and the Binary Examination.

The Lawrence F. Stauder Award. For achievement in electrical engineering, recalling electronics, service to our neighbor, and the little man in the circuit.

The IEC William L. Everett Award. For achievement in electrical engineering, computer engineering, or computer science, with an interest in the area of communications.

Student Organizations and Activities

HONOR SOCIETIES

TAU BETA PI
In 1960, the Indiana Gamma Chapter of Tau Beta Pi was installed at Notre Dame to foster a spirit of liberal culture in the engineering college and to recognize those who have conferred honor upon Notre Dame by distinguished scholarship and exemplary character as undergraduates in engineering or by their attainment as alumni in the field of engineering. Seniors in the top fifth of their class and juniors in the top eighth of their class are eligible for election under rigid standards of scholarship, character, leadership, and service.

ETA KAPPA NU
In 1962, the Delta Sigma Chapter of Eta Kappa Nu, the national honor society for electrical engineers, was installed at Notre Dame. Juniors, seniors, and alumni are elected to membership on the basis of scholastic attainment, leadership, and quality of character.

PI TAU SIGMA
In 1963, the Sigma Beta Chapter of Pi Tau Sigma, the national honor society for mechanical engineers, was installed at Notre Dame. Juniors, seniors, and alumni are elected to membership on the basis of scholastic attainment, leadership, quality of character, and a demonstration of probable future success in engineering.

CHI EPSILON
In 1966, the Notre Dame Chapter of Chi Epsilon, the national honor society for civil engineers, was installed at Notre Dame. Chi Epsilon recognizes those civil engineering students, faculty, and alumni who have displayed superior qualities in scholarship, character, practicality, and sociability during their professional careers.

SIGMA GAMMA TAU
In 1981, the Notre Dame Chapter of Sigma Gamma Tau, the national honor society for aerospace engineers was installed. This organization recognizes and honors those individuals in the field of aeronautics and astronautics who have distinguished themselves through scholarship, integrity, service, and outstanding achievement. Senior students who rank in the top third of their aerospace engineering class are eligible for admission.

UPSILON PI EPSILON
In 2004, the Notre Dame chapter of Upsilon Pi Epsilon, which recognizes the academic excellence of students in the computing and information disciplines, was installed at Notre Dame. Outstanding juniors, seniors, and graduate students from the Department of Computer Science and Engineering are honored each year with induction.
PROFESSIONAL SOCIETIES
Several departments of the college actively support student chapters of their respective professional societies; these are:

- American Institute of Aeronautics and Astronautics (AIAA)
- American Institute of Chemical Engineers (AIChe)
- American Society of Civil Engineers (ASCE)
- American Society of Mechanical Engineers (ASME)
- Association of Computer Machinery (ACM)
- Institute of Electrical and Electronic Engineers (IEEE)
- National Society of Black Engineers (NSBE)
- Society of Hispanic Professional Engineers (SPHE)
- Society of Women Engineers (SWE)

The Engineering Leadership Council (ELC), a student organization with representation from the college’s professional and honor societies, coordinates the activities of all engineering organizations and encourages the pursuit of a professional attitude in the student body of the College of Engineering. The ELC sponsors activities of general interest to the engineering student body.

Aerospace and Mechanical Engineering

Chair:
Kenneth T. Christensen

Associate Chair:
James P. Schmiedek
H. Clifford and Evelyn A. Brosey Professor of Mechanical Engineering:
Frank P. Incropera (emeritus)
Roth-Gibson Professor of Engineering:
Eric J. Jumper
Viola D. Hank Professor of Mechanical Engineering:
Kenneth T. Christensen; Nicholas Zabaras

Clark Professor:
Thomas C. Corke
Sheehan Family Associate Professor:
Pinar Zorlutuna
Clare Boothe Luce Assistant Professor:
Maria Holland

Dunn Family Teaching Professor:
Michael J. Seelinger

Professors:
Hafia M. Atassi (emeritus); Stephen M. Batill (emeritus); Raymond M. Brach (emeritus); Patrick F. Dunn (emeritus); David B. Go; J. William Goodwine Jr.; Tengfei Luo; Karel Matous; Scott C. Morris; Thomas J. Mueller (emeritus); Robert C. Nelson (emeritus);

Glen L. Niebur; Timothy C. Ovaert; Samuel Paolucci (emeritus); Joseph M. Powers; Ryan K. Roeder; Steven R. Schmid (emeritus); James P. Schmiedek; Mihir Sen (emeritus); Steven B. Skaar (emeritus); Albin A. Szewczyk (emeritus);
Flint O. Thomas; Meng Wang; Kwang-tzu Yang (emeritus)

Associate Professors:
Stanislav Gordeyev; Thomas Juliano; Edward Kinzel; John W. Lucey (emeritus); Ryan G. McClarren; Svetlana Neretina; Hirotaika Sakae;
Michael M. Stanisic; Yanliang Zhang

Assistant Professors:
Donny Hanjaya-Putra; James E. Houghton (emeritus); Jonathan MacArt; Mark Pileckis; Jian Xun Wang; Patrick Wensing; Sanggil Yoon; Matthew J. Zahr

Associate Teaching Professors:
John Ott; Richard B. Streibinger

Assistant Teaching Professors:
Paul F. Rumbach; Jing Wang

Program of Studies. The Department of Aerospace and Mechanical Engineering offers programs of study that lead to degrees of bachelor of science and master of science in aerospace engineering and mechanical engineering, respectively; and doctor of philosophy.

Program in Aerospace Engineering. This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The aerospace program is designed to prepare those students interested in the design and operation of aircraft and space vehicles for entrance into a professional career. The curriculum, based on a solid foundation in mathematics, physics, chemistry and the engineering sciences, places emphasis on such basic aerospace disciplines as aerodynamics and fluid mechanics, orbital mechanics, and solid and structural mechanics, as well as such integrating disciplines as design, experimental methods and systems analysis. Technical specializations in the junior and senior year enable students to emphasize specific technical areas, including design and manufacturing, thermal and fluid sciences, bioengineering, solid mechanics, materials, control and mechanical systems and computational engineering.

The aerospace engineering program uses laboratories in Fitzpatrick Hall of Engineering and in the Hessert Laboratory for Aerospace Research. The Hessert laboratories contain superior facilities for instruction and research.

Students are encouraged to participate in the activities of the student chapter of the American Institute of Aeronautics and Astronautics and to enter the national student paper competition conducted by the parent institute and other aerospace extracurriculars such as ND Rocketry and Design, Build, Fly. Outstanding achievement in the aerospace program is recognized by membership in Sigma Gamma Tau, the national aerospace honor society.

Further details about the standard aerospace program, the Rome Program and electives can be found on the Web at ame.nd.edu.

Aerospace Engineering Program Educational Objectives and Student Outcomes. The Engineering Accreditation Commission of ABET encourages the explicit statement of the Program Educational Objectives and Learning Outcomes for all engineering programs. Publication of the objectives and desired outcomes, as well as efforts to determine if these are being achieved, are part of the process of continuous improvement in engineering education.

Program Educational Objectives. The Department of Aerospace and Mechanical Engineering has established the following Program Educational Objectives that are consistent with the mission of the University and College of Engineering. These objectives have been developed in collaboration with faculty, students, and industry representatives. Program Educational Objectives are “broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve.” These are usually recognized as accomplishments in the first few years after graduation.

The aerospace engineering program at Notre Dame appreciates the diverse set of individual goals to which our students aspire, so it has expressed the Program Educational Objectives in two forms. Graduates of the program should:

• Secure a position consistent with their personal aspirations and qualifications
• Assume a technical or managerial leadership role with their organization
• Participate as a volunteer with at least one professional or social service organization

In addition, depending on the career path selected, graduates would be prepared to achieve one or more of the following:

• Be recognized as the key technical specialist within their organization for a particular professional specialty
• Receive a graduate or professional degree
• Start their own company
• Be granted a patent

Student Learning Outcomes. To achieve these Program Educational Objectives, the curriculum is designed to provide the following Student Learning Outcomes that describe what students are expected to know or be able to do by the time of graduation.

First Principles and Problem Solving: Graduates understand fundamental scientific first principles of engineering and can apply them to the solution of problems or systems by way of analytical and numerical treatment.

Engineering Skills and Professional Practice: Graduates understand the essential role of experimentation in engineering, and they are able to compare and gain insight from a combination of analytical, numerical, and experimental results. They are able to use modern engineering software tools, including CAD, and are capable of programming digital computers.
Aerospace and Mechanical Engineering

Design: Graduates have a pragmatic understanding of design and the engineering design process and are able to contribute in various ways to the design of a product, system, or process.

Communication: Graduates are able to communicate well, both orally and in writing, and function effectively in multidisciplinary groups, both in leadership and support roles.

Professional Responsibility: Graduates are familiar with the responsibilities of professional practice, the roles that aerospace engineers play in society, the kinds of issues they deal with, and their influence in society.

First Year of Studies
First-year students intending to major in aerospace engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following schedule is applicable to the students entering the College in 2020.

Sophomore Year
First Semester
MATH 20550. Calculus III 3.5
PHYS 10320. Engineering Physics II: Electromagnetism 4
AME 20211. Introduction to Aeronautics 3
AME 20214. Introduction to Engineering Computing 1
AME 20216/21216. Lab I/1L or AME 21267. Design Tools I 2
AME 20221. Mechanics I 3

16.5

Second Semester
MATH 20580. Introduction to Linear Algebra and Differential Equations 3.5
AME 20222. Mechanics II 3
AME 20231. Thermodynamics 3
AME 20241. Solids Mechanics 3
AME 21267. Design Tools I or AME 21267/21267. Lab I/IIL 2
Core University requirement + 3

17.5

Junior Year
First Semester
AME 20217/21217. Lab II/IIL 2
AME 21268. Design Tools II 2
AME 30314. Differential Equations, Vibrations and Controls I 3
AME 30331. Fluid Mechanics 3
AME 30341. Aerospace Structures 3
Core University requirement + 3

16

Second Semester
AME 30315. Differential Equations, Vibrations and Controls II 3
AME 30332. Compressible Aerodynamics 3
AME 30333. Theoretical and Experimental Aerodynamics 4
AME 30334. Heat Transfer 3

Mechanical Engineering Educational Objectives and Student Learning Outcomes. The Engineering Accreditation Commission of ABET encourages the explicit statement of the Program Educational Objectives and Student Learning Outcomes for all engineering programs. Publication of the objectives and desired outcomes, as well as efforts to determine if these are being achieved, are part of the process of continuous improvement in engineering education.

Program Educational Objectives. The Department of Aerospace and Mechanical Engineering has established the following Program Educational Objectives that are consistent with the mission of the University and College of Engineering. These objectives have been developed in collaboration with faculty, students, and industry representatives. Program Educational Objectives are “broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve.” These are usually recognized as accomplishments in the first few years after graduation.

The mechanical engineering program at Notre Dame appreciates the diverse set of individual goals to which our students aspire, so it has expressed the educational objectives in two forms. Graduates of the program should:

- Secure a position consistent with their personal aspirations and qualifications
- Assume a technical or managerial leadership role with their organization
- Participate as a volunteer with at least one professional or social service organization

In addition, depending on the career path selected, graduates would be prepared to achieve one or more of the following:

- Be recognized as the key technical specialist within their organization for a particular professional specialty
- Receive a graduate or professional degree
- Start their own company
- Be granted a patent

Student Learning Outcomes. To achieve these Program Educational Objectives, the curriculum is designed to provide the following Student Learning Outcomes that describe what students are expected to know or be able to do by the time of graduation.

First Principles and Problem Solving: Graduates understand fundamental scientific first principles of engineering and can apply them to the solution of problems or systems by way of analytical and numerical treatment.

Engineering Skills and Professional Practice: Graduates understand the essential role of experimentation in engineering, and they are able to compare and gain insight from a combination of analytical, numerical, and experimental results. They are able to use modern engineering software tools, including CAD, and are capable of programming digital computers, including microprocessors.
### Design:
Graduates have a pragmatic understanding of design and the engineering design process and are able to contribute in various ways to the design of a product, system, or process.

### Communication:
Graduates are able to communicate well, both orally and in writing, and function effectively in multidisciplinary groups, both in leadership and support roles.

### Professional Responsibility:
Graduates are familiar with the responsibilities of professional practice, the roles that mechanical engineers play in society, the kinds of issues they deal with, and their influence in society.

#### First Year of Studies
First-year students intending to major in chemical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following schedule is applicable to the EG Class of 2020.

### Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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</thead>
<tbody>
<tr>
<td>MATH 20550. Calculus III</td>
<td>AME 21268. Design Tools II</td>
</tr>
<tr>
<td>PHYS 10320. General Physics II</td>
<td>AME 20315. Differential Equations, Vibrations and Controls II</td>
</tr>
<tr>
<td>AME 20214. Introduction to Engineering Computing</td>
<td>AME 30334. Heat Transfer</td>
</tr>
<tr>
<td>AME 20216/21216. Lab I/II or AME 21267. Design Tools I</td>
<td>EE 20222. Introduction to Electrical Engineering and Embedded Systems</td>
</tr>
<tr>
<td>AME 20221. Mechanics I</td>
<td>Core University requirement +</td>
</tr>
<tr>
<td>CBE 30361. Science of Eng. Materials or Core University requirement +</td>
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</tr>
</tbody>
</table>

### Second Semester

| MATH 20580. Introduction to Linear Algebra and Differential Equations | AME 30362. Design Methodology |
| AME 20222. Mechanics II | AME Technical Elective |
| AME 20231. Thermodynamics | AME Technical Elective |
| AME 20241. Solid Mechanics | General Technical Elective* |
| AME 21267. Design Tools I or AME 20216/21216. Lab I/II | Core University requirement + |
| Core University requirement + or CBE 30361. Science of Eng. Materials |  |
|  | 17.5 |

### Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
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<tbody>
<tr>
<td>AME 20217/21217. Lab II/III</td>
<td>AME 40463. Senior Design Project</td>
</tr>
<tr>
<td>AME 30314. Differential Equations, Vibrations and Controls I</td>
<td>AME Technical Elective</td>
</tr>
<tr>
<td>AME 30331. Fluid Mechanics</td>
<td>AME Technical Elective</td>
</tr>
<tr>
<td>AME 30363. Design of Machine Elements</td>
<td>General Technical Elective*</td>
</tr>
<tr>
<td>AME 40423. Mechanisms and Machines</td>
<td>Core University requirement +</td>
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<td>Core University requirement +</td>
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### Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME 30362. Design Methodology</td>
<td>AME 40463. Senior Design Project</td>
</tr>
<tr>
<td>AME Technical Elective</td>
<td>AME Technical Elective</td>
</tr>
<tr>
<td>AME Technical Elective</td>
<td>General Technical Elective*</td>
</tr>
<tr>
<td>Core University requirement +</td>
<td>Core University requirement +</td>
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</tbody>
</table>

Total for the four years: 133 semester hours.

*A list of approved AME and technical specialization courses is available on the department website.

* See "University Core Curriculum" on the first page of the College of Engineering section.

The most current information for the degree program course requirements is available on the department website: [ame.nd.edu](http://ame.nd.edu).

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Aerospace and Mechanical Engineering. Course descriptions can be found by clicking on the subject code and course number in the search results.

A number of introductory graduate-level courses, described in the Graduate School Bulletin of Information and on the department website, are open to advanced undergraduates to satisfy upper-level electives.
undergraduates participate in research activities with

More than one-third of the chemical engineering

medical school is also available.

course sequence for students interested in going to

energy, and biomolecular engineering. A suggested

courses to be taken both fall and spring semesters.

Sophomore Year

First Semester

MATH 20550. Calculus III  3.5
CHEM 11172. Organic Chemistry Lab I 1
PHYS 10320. General Physics II 4
CBE 20255. Introduction to Chemical Engineering Analysis 3
Core Curriculum course+  3

Second Semester

MATH 20580. Introduction to Linear Algebra and Differential Equations 3.5
CHEM 20273. Organic Chemistry II 3
CBE 20260. Chemical Engineering Thermodynamics I 3
CBE 20258. Numerical and Statistical Analysis 3
CBE 20290. Career Choices for Engineers**  1
Core Curriculum course+ 3

Junior Year

First Semester

MATH 30650. Differential Equations 3
CHEM 30333. Analytical Chemistry 3
CHEM 31333. Analytical Chemistry Lab I 1
CBE 30355. Transport Phenomena I or CBE 30357. Biotransport 3
CBE 30367. Chemical Engineering Thermodynamics II 3

Second Semester

CHEM 30324. Physical Chemistry 3
CBE 30356. Transport Phenomena II 3
CBE 31358. Chemical Engineering Laboratory I 3
CBE 30338. Chemical Process Control 3
Core Curriculum course+ 3

Senior Year

First Semester

CBE 41459. Chemical Engineering Laboratory II or CBE 41910. Biomolecular Engineering Laboratory II 3
CBE 40443. Separation Processes 3
CBE 40445. Chemical Reaction Engineering 3
Chemical Engineering Elective* 3
Core Curriculum course+ 3

Second Semester

CBE 40448. Chemical Process Design 3
Chemical Engineering Elective* 3
Technical Elective* 3
Technical Elective* 3
Core Curriculum course+ 3

** CBE 20290 is recommended in this semester but not required.

* Technical Electives are 3XXX+ courses in the College of Science or College of Engineering intended for STEM majors. Chemical Engineering electives are CBE XXXX+ courses not specifically required for degree completion. A maximum of 3 credits of approved undergraduate research may count toward the 6 credits of required technical electives.

121

Chemical and Biomolecular Engineering

careers in areas such as advanced materials, ionic liquids, separations, biomaterials, microfluidic devices, catalysis, fuel cells, and drug delivery techniques.

Further details about the chemical engineering program may be found at "cbe.nd.edu.

First Year of Studies

First-year students intending to major in chemical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following degree requirements are applicable to students first matriculating Fall 2020. The schedule presented here is for normal 4-year progress through the degree. Curricular flexibility allows for many courses to be taken both fall and spring semesters.

1. Pursue knowledge and commensurate understanding and critically evaluate the consequences of these.
2. Communicate clearly and effectively.
3. Demonstrate proficiency in the art and science of chemical engineering with a strong understanding of the fundamental principles of pure and engineering sciences on which chemical engineering practice is based.
4. Appreciate their social and moral responsibilities both within their careers in engineering and through service in their communities.
5. Understand how chemical engineering connects with other major disciplines to produce the goods and services needed by society.

Within the chemical engineering degree program, students can complete concentrations in materials, energy, and biomolecular engineering. A suggested course sequence for students interested in going to medical school is also available.

More than one-third of the chemical engineering undergraduates participate in research activities with faculty and graduate students at some time in their

Table of Contents

To Table of Contents
Civil and Environmental Engineering and Earth Sciences

Henry J. Maasman Chair:
Joannes J. Westerink
Associate Chair:
Yahya C. Kurama
Henry J. Maasman Professor of Civil Engineering:
Peter C. Burns
Robert M. Moran Professor of Civil Engineering:
Ahsan Kareem
Wayne and Diane Murdy Professor of Engineering and Geosciences:
Harindra J. Fernando
Joseph and Nona Ahearn Professor in Computational Science and Engineering:
Joannes J. Westerink

Professors:
Didgo Bolster; Jeremy B. Fein; Robert L. Irvine (emeritus); Andrew Kennedy; Patricia A. Maurice (emerita); Clive R. Neal; Robert Nerenberg; James I. Taylor (emeritus); Yahya C. Kurama; Stephen E. Silliman (emeritus); Alexandros Tafanidis

Associate Professors:
Kyle Bibby; Kyle Doudrick; Alan Hamlet; Amy Hixon; Lloyd H. Ketchum Jr. (emeritus); Kapil Khandelwal; Tracy L. Kijewski-Correa; David J. Kirkner (emeritus); Jerry J. Marley (emeritus); David Richter; Rev. James A. Rigert, C.S.C. (emeritus); Joshua Shrouf; Antonio Simonetti; Alexandros Tafanidis; Ashley Thrall; Na Wei

Assistant Professors:
Melissa Berke; Marc Muller

Visiting Professors:
Albert Cerrone; Paola Crippa

Teaching Professor:
James Alleman

Associate Teaching Professors:
Stefania Simonetti; Brian Smith

Assistant Teaching Professor:
Kevin Walsh

Program of Studies. The Department of Civil and Environmental Engineering and Earth Sciences offers programs of study leading to the degrees of bachelor of science in civil engineering, bachelor of science in environmental engineering, bachelor of science in environmental earth science, master of science in civil engineering, master of science in geological sciences (for graduate students entering the program in or prior to the fall of 2012), master of science in environmental engineering, master of science in environmental earth sciences (for graduate students entering the program in or after the fall of 2013), and doctor of philosophy.

Program Goals. The Department of Civil and Environmental Engineering and Earth Sciences (CEEES) focuses on knowledge related to civil infrastructure, natural and manmade hazards, environment, energy, water, and planet systems. We emphasize a strong foundation in science and engineering with a focus in the areas of structural engineering, environmental engineering, environmental fluid dynamics, and geochromy. Our professions develop the fundamental and applied technologies that impact people’s health, well-being, and ability to thrive through our work on infrastructure (buildings, bridges, tunnels, waterways, ports, roads, dams, offshore energy platforms, wind farms), clean water supply (water resources, water distribution and water treatment), sewage and waste disposal (wastewater treatment), protection from natural hazards (earthquakes, tornadoes, tsunamis, riverine floods, winds, waves, hurricanes), energy systems (offshore oil extraction, wind farms, hydro-electric, nuclear fuel reprocessing), safe and sustainable environments (pollutants in the atmosphere, groundwater, surface water, reactive transport of pollutants within these systems, biological and geochemical processes, the interplay of natural processes such as mineral-water-rock-bacteria interactions, and anthropogenic issues such as transport of toxic heavy metals and safe disposal of nuclear waste), and the larger geophysical and geochemical earth system. CEEES strives to provide a stimulating and unique interdisciplinary environment for learning and research by blending traditional disciplines of science and engineering. CEEES offers outstanding educational programs for those aspiring to contribute as leaders in the fields of Civil Engineering, Environmental Engineering, and Environmental Earth Sciences. CEEES educational objective is to provide students with the knowledge, skills, vision and ethical basis to contribute as leaders in design, construction and protection of our civil infrastructure, and understanding, management and remediation of the environment.

CEEES has very innovative undergraduate programs that synergize classroom teaching with research, field trips, lecture series and hands on experiences that expose students to the realities and professionals in their field. These programs are designed to be inspirational and lead to inquiry as well as lead to life-long connections in the field. All of our students experience in-depth fieldtrips and the majority of our students participate in research programs, thematic professional competitions, and professional lecture series. In addition, our students have a strong tradition of service in programs such as NDSEED, a student organization that proposes, designs, finances and builds bridges for poor communities in Central America, and Engineers Without Borders. The department has a long tradition of placing its graduates from both undergraduate and graduate programs into sectors that truly serve society from their most basic needs of clean water and shelter to the advanced energy and transportation systems that sustain a thriving economy and a high standard of living. Our alumni have a history of success and exemplary leadership in academia, consulting, national laboratories, construction, and industry.

PROGRAM IN CIVIL ENGINEERING.

This program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The department presents a well-rounded program for the bachelor’s degree with the first two years devoted primarily to the basic principles of science and engineering. The third and fourth years are devoted to courses in the basic areas of civil engineering—structural analysis and design, hydraulics and hydrology, water supply and wastewater disposal, materials of construction, geotechnical engineering, and transportation engineering. A student may emphasize a particular area of interest by selecting either the structures or hydraulics concentrations. Civil engineering electives in the senior year may be regular courses, individualized directed study or research courses. The civil engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design projects to facilitate the student’s understanding of the design process. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

The program provides a firm foundation in the many basic disciplines comprising the broad field of civil engineering. This is especially desirable, for often in the course of professional development the civil engineer is asked to coordinate the planning, design, and construction of highly complex systems and must use many or all of these disciplines.

The department has excellent facilities for research available to both graduate and undergraduate students. These facilities include a structural dynamics/structural control laboratory; a materials testing and structural research laboratory; a groundwater hydrology field laboratory; and a number of analytical laboratories for water, wastewater and hazardous waste treatment.

The professional aspects of civil engineering are emphasized and promoted by the activities of a student chapter of the American Society of Civil Engineers, in which all students of the department are eligible and encouraged to participate. In addition, a junior class field trip examines major infrastructure projects and environmental systems including tall buildings, bridges, stadiums, transportation systems, navigations systems, flood protection works, clean water supply, and wastewater systems.

Further details about the civil engineering may be found on the Web at ceees.nd.edu.

First Year of Studies

First-year students intending to major in civil engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.
Civil and Environmental Engineering and Earth Sciences

The following courses are applicable to students entering the College in 2020.

**Sophomore Year**

**First Semester**
- MATH 20550. Calculus III 3.5
- PHYS 10320. General Physics II 4
- CE 20150. Statics 3
- CE 20111. Planet Earth 3
- CE 20600. Intro to CAD 2
- CE 20230. Engineering Programming 1

**Second Semester**
- MATH 20580. Introduction to Linear Algebra and Differential Equations 3.5
- ACMS 30440. Probability and Statistics 3
- AME 20241. Solid Mechanics 3
- CE 30160. CE Materials 4
- Core Curriculum course+ 3

**Junior Year**

**First Semester**
- MATH 30650. Differential Equations 3
- CE 30125. Computational Methods 3
- CE 30200. Intro to Struct. Engng 3
- CE 30300. Intro to Env. Engng 3
- CE 30460. Fluid Mechanics 3

**Second Semester**
- CE 40270. Reinf. Concrete Design 4
- CE 40450. Hydraulics 3.5
- CE 30150. Dynamics & Modeling 3
- Core Curriculum course+ 3
- Core Curriculum course+ 3

**Senior Year**

**First Semester**
- CE 40620. Transportation 3
- Core Concentration Elective* 3
- CE 40701. Principles of Practice 1
- CE 30510. Intro to Geotech Engineering 3.5
- Core Curriculum course+ 3

**Second Semester**
- CE 40702. Senior Design 3
- Core Concentration Elective* 3
- CE Elective** 3
- CE Elective** 3
- Core Curriculum course+ 3

**Total degree required credits** 130

*See “University Core Curriculum” on the first page of the College of Engineering section.

**Note:** All electives are as defined in the academic guide for the Department of Civil and Environmental Engineering and Earth Sciences on the department’s website.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

**ENVIRONMENTAL ENGINEERING**

**Program in Environmental Engineering.** The Environmental Engineering program at Notre Dame is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. This program was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education regarding the assessment and remediation of human impact on our environment. It is a unique program that prepares students to look at all aspects of water and environmental problems from a range of perspectives including the Earth system, water movement (hydrology, fluid flow), environmental chemistry, geochemistry, and reactive transport. The Environmental Engineering degree program will prepare students to understand the necessary foundational chemistry, fluid flow and mixing mechanics, all within the context of the Earth system.

The environmental engineering program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to conduct independent research under faculty supervision during their junior and senior years. The environmental engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design project to facilitate the student’s understanding of the design process. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

The professional aspects of civil and environmental engineering are emphasized and promoted by the activities of a student chapter of the American Society of Civil Engineers, in which all students of the department are eligible and encouraged to participate. In addition, a junior class field trip examines major infrastructure projects and environmental systems including tall buildings, bridges, stadiums, transportation systems, navigation systems, flood protection works, clean water supply, and wastewater systems.

Environmental Engineering students will be ready to work as environmental engineers remediating the environment on local and global scales with opportunities available in engineering consulting firms, government agencies, national laboratories, and industries requiring monitoring and advancement of remediation technologies. Additionally, the environmental engineering degree will prepare students for graduate study in Environmental Engineering programs.

Further details about the environmental engineering program may be found on the Web at ceees.nd.edu.

**First Year of Studies**

First-year students intending to major in civil engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following courses are applicable to students entering the College in 2020.

**Sophomore Year**

**First Semester**
- CE 20110. Planet Earth w/lab 4
- PHYS 10320. Physics II 4
- CE 30300. Intro to Env. Eng. 3
- CE 31300. Intro to Env. Eng. Lab 1
- MATH 20550: Calculus III 3.5
- CE 20150. Statics 3

**Second Semester**
- CE 20300. Global Change, Water & Energy 3
- CE 20320. Env. Aquatic Chem 3
- MATH 20580. Linear Alg. Diff. Equations 3.5
- ACMS 30440. Prob. & Stats. 3
- Core Curriculum course+ 3
- CE 20230: Engineering Programming 1

**Junior Year**

**First Semester**
- CE 30125. Comp. Methods 3
- CE 20520. Env. Mineralogy 4
- CE 30460. Fluid Mechanics 3
- CE 40320. Water Chemistry & Treatment 3
- Core Concentration Elective 3

**Second Semester**
- CE 30200. Global Change, Water & Energy 3
- CE 40450. Hydraulics 3
- CE 30300. Intro to Env. Eng. 3
- CE 40300. Geochemistry 3
- CE 40300. Intro to Env. Eng. Lab 1
- Core Curriculum course+ 3

**Senior Year**

**First Semester**
- CE 40350. Env. Microbiology 3
- CE 31300. Intro to Struct. Engng 3
- CE 30338. Design Tools for Env. Engineering 1
- CE 31300. Intro to Struct. Engng 3
- CE 40341. Biological Process Design 3
- Core Curriculum course+ 3

**Second Semester**
- CE 30320. Water Chemistry & Treatment 3
- CE 30455. Env. Hydrology 3
- CE 40450. Hydraulics 3
- Core Curriculum course+ 3
- CE 40341. Biological Process Design 3
- CE 30338. Design Tools for Env. Engineering 1

**Total degree required credits** 130

To Table of Contents
**All electives are defined in the Academic Guide for the College of Engineering section.

Total credit hours required for degree  131

+See “University Core Curriculum” on the first page of the College of Engineering section.

**All electives are defined in the Academic Guide for the Department of Civil and Environmental Engineering & Earth Sciences, available on the department web site.

ENVIRONMENTAL EARTH SCIENCES

Program in Environmental Earth Sciences.
The Environmental Earth Sciences program at Notre Dame was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education in the disciplines of the earth and environmental science. This degree program blends the disciplines of fluid dynamics and hydrology, environmental chemistry and geochemistry framed within the larger context of Earth systems and focuses more on the geology side of the environment and planetary systems. The program provides a foundation in the physical sciences, with emphasis on processes that occur near or at the surface of Earth, and the impact of human activity on such processes. Students explore the geochemical, mineralogical and hydrological properties of Earth's crust, and develop an understanding of the interplay of natural processes such as mineral-water-rock-bacteria interactions, with anthropogenic issues such as transport of toxic heavy metals and safe disposal of nuclear waste.

The environmental earth sciences program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to conduct independent research under faculty supervision during their senior year. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

An undergraduate major in Environmental Earth Sciences prepares a student for graduate study (M.S., Ph.D.) in many aspects of earth science and environmental science and engineering, as well as for admission to a variety of professional schools. Graduates with a B.S. degree may enter careers in diverse areas such as the National Park Service, industry, environmental consulting, and government research laboratories. An Environmental Earth Science degree is also ideal background for those planning to teach in secondary schools at all levels.

Below you will see an example of the curriculum that can be followed by an incoming student who wishes to major in environmental earth sciences. However, the flexibility of our undergraduate program allows students to switch to environmental earth sciences if they have followed either an engineering or science track during their first year.

Further details about the environmental earth sciences program may be found on the Web at ceees.nd.edu.

First Year Engineering
First-year students intending to major in environmental earth sciences when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following course schedule is applicable to the students entering the College in 2020.

Sophomore Year
First Semester
CE 20110. Planet Earth w/ lab 4
PHYS 10320. Physics II 4
CE 30300. Intro to Env. Eng w/lab 4
MATH 20550. Calculus III 3.5

Second Semester
CE 20300. Global Change, Water & Energy 3
CE 20320. Env. Aquatic Chem 3
MATH 20580. Linear Alg. Diff. Equations 3.5
ACMS 30440. Prob. & Stats. 3
Core Curriculum Course+ 3
CE 20230. Engineering Programming 1
CE 23601. Chlg. & Innov. of CE Eng. 0

Junior Year
First Semester
CE 30125. Comp. Methods 3
CE 20520. Env. Mineralogy 4
CE 45300. Fall Field Trip 1
CE 305900. Surficial Processes 3
Core Curriculum Course+ 3
Technical Elective 3

Second Semester
CE 30540. Petr. of Earth Materials 4
CE 30560. Dynamic Earth 3
CE 45200. Field Trip 1
Core Curriculum Course+ 3
CE 30455. Environmental Hydrology 3

Senior Year
First Semester
CE 40300. Geochemistry 3
CE 40460. Groundwater Hydrology 3
Technical Elective 3
Core Curriculum Course+ 3

Second Semester
CE Elective* 3
CE Elective* 3
CE Elective* 3
CE 40350. Environmental Microbiology 3
Core Curriculum Course+ 3

Total credits required for degree  126

+See "University Core Curriculum" on the first page of the College of Engineering section.

**All electives are defined in the Academic Guide for the Department of Civil and Environmental Engineering & Earth Sciences, available on the department web site.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

MINOR IN ENVIRONMENTAL EARTH SCIENCES

A minor in environmental earth sciences requires the completion of 16 credit hours in geological sciences as follows.

CE 20110. Planet Earth 4
CE 20520. Environmental Mineralogy 4
CE 45200 or CE 45300. Field Trip 1
EVES Elective 4
EVES Elective 3

For more details visit https://ceees.nd.edu/undergraduate/current-students/minors-offered.

RESILIENCY & SUSTAINABILITY OF ENGINEERING SYSTEMS

The Resiliency and Sustainability of Engineering Systems minor is open to students from all disciplines in the College of Engineering and students from the University who can satisfy the pre-requisites for the required courses. The minor includes two required courses, three elective courses, and a capstone experience. The two required courses are:

CE 10700. Sustainable Development in a Changing World 3
CE 20710. Resiliency of Engineering Systems 3
Elective 3
Elective 3
Elective 3
Capstone 1

To Table of Contents
The three elective courses will be selected from an approved list in collaboration with the director of the minor. Options to fulfill this requirement span multiple departments and include approved courses from departments such as Political Science, Psychology, Philosophy, Laws, Economics, and Sociology. For details please visit http://ceees.nd.edu/undergraduate/resiliency-and-sustainability-of-engineering-systems.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Civil Engineering. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Computer Science and Engineering**

*Fritz Duda Family Professor of Engineering and Department Chair of Computer Science and Engineering:*

- Patrick J. Flynn

*Professor and Associate Chair:*

- Douglas Thain

*Professor and Director of Graduate Studies:*

- Jane Cleland-Huang

*Teaching Professor and Director of Undergraduate Studies:*

- Ramzi K. Bualaa

*Professor and Director of the Bachelor of Arts in Computer Science Program:*

- Aaron Striegel

*Frank M. Freimann Professor of Computer Science and Engineering:*

- Nitish Chawla

*Ted H. McCourtney Professor of Computer Science and Engineering:*

- Peter M. Kogge

*Schumehl-Prein Professor of Computer Science and Engineering:*

- Kevin W. Bowyer

*Professor of the Practice:*

- Jay B. Brockman

*Professors:*

- Rick Billo; Danny Z. Chen; X. Sharon Hu; Michael Niemier; Christian Poellabauer

*Freimann Collegiate Associate Professor:*

- Tijana Milenkovic

*Freimann Collegiate Associate Professor:*

- Timothy Weninger

*Associate Professors:*

- David Chiang; Collin McMillan; Ronald Metoyer; Walter Scheier; Yiju Shi; Chao Li; Dong Wang

*Assistant Professors:*

- Adam Czajka; Meng Jiang; Siddharth Joshi; Taeho Jung

*Associate Teaching Professor:*

- Peter Bui

*Assistant Teaching Professors:*

- Shreya Kumar; Matthew Morrison; Corey Pennycuff

*Professors Emeritus:*

- Eugene W. Henry; John J. Uhlan Jr.

*Research Professor Emeritus:*

- Gregory R. Maday

**Program of Studies.** The Department of Computer Science and Engineering offers programs of study that lead to the degrees of bachelor of science in computer science and bachelor of science in computer engineering. The program in computer engineering is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org. The program in computer science is accredited by the Computing Accreditation Commission of ABET, http://www.abet.org. The department also offers programs that lead to a master of science in computer science and engineering, and a Ph.D.

**Educational Goals.** The goals of the programs in computer science and computer engineering are (1) to prepare all students for careers in the public or private sector; (2) to prepare outstanding students for graduate study; (3) to develop lifelong learning skills in all students; (4) to provide comprehensive education in computer science, including theoretical foundations, software and hardware systems, and applications; and (5) to ensure significant design experience including working in teams.

**Program Outcomes.** At the time of completion of the undergraduate program, all graduates should possess (1) the ability to specify, design, test, and document software; (2) an understanding of current computer software and hardware technology; (3) an understanding of science, engineering, and mathematics; (4) a comprehensive general education; (5) the ability to continue learning in response to professional needs as well as personal desire for self-improvement; and (6) an understanding of personal and professional responsibility to society.

**Programs.** Programs in the Department of Computer Science and Engineering follow the four-year curricula listed below. These include required and elective courses in the basic, pure, and applied sciences, as well as the humanities, electrical engineering, computer science, and computer engineering. Emphasis is on developing a mastery of the key principles underlying the organization, operation, and application of modern computers to real problems, with a solid grounding in math and science to permit a quantitative analysis of such solutions. In addition, central to both programs is the development of the ability to function, both independently and in multidisciplinary teams, and to be prepared for continued change in future computing technology and what effects it will have on all aspects of society. Opportunities for specialization in several professional computer disciplines are available. Students are individually assisted and advised in their choices of elective courses.

The Department of Computer Science and Engineering offers concentrations in five areas: Bioinformatics and Computational Biology, Media Computing, Mobile Computing, Cloud Computing, and Cyber Security. Each concentration is designed to offer a structured set of elective courses around an organized theme. Upon a student’s successful completion of a CSI/CPEG program with a chosen concentration, the concentration will appear on the student’s transcript.

Further information about computer science and computer engineering programs may be found on the Web at cse.nd.edu.

**PROGRAM IN COMPUTER ENGINEERING**

The Program in Computer Engineering focuses on understanding the basic nature of the electronic devices that go into the creation of modern computers and on the detailed architecture and organization of such systems, both within the central processing unit and in how larger systems are assembled. Modern design tools and techniques are introduced very early in the program and used throughout to design, analyze, and prototype real digital computing systems. All computer engineering students are required to enroll in at least one of a prescribed set of design courses before graduation.

**PROGRAM IN COMPUTER SCIENCE**

The Program in Computer Science focuses on the application of computers to real problems, especially in the design, development, and use of software. The program is designed to foster an understanding of the key properties of algorithms (the mathematical statements of how problems are to be solved), and how to recognize and design good algorithms to solve real problems in efficient ways. The program also includes developing the ability to engineer large, efficient, portable, and scalable pieces of software that implement good algorithms in ways that are useful to the end users, and to do so in ways that use modern software development tools and techniques.

**First Year of Studies**

First-year students intending to major in computer engineering or in computer science when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following class schedules are applicable to the students entering the College in Fall 2020.

**COMPUTER ENGINEERING PROGRAM**

**Sophomore Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
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<tbody>
<tr>
<td>PHYS 10320</td>
<td>General Physics II</td>
<td>4</td>
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<tr>
<td>CSE 20110</td>
<td>Discrete Mathematics</td>
<td>3</td>
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<tr>
<td>CSE 20311</td>
<td>Fundamentals of Computing</td>
<td>4</td>
</tr>
<tr>
<td>MATH 20550</td>
<td>Calculus III</td>
<td>3.5</td>
</tr>
<tr>
<td>Core Curriculum course +</td>
<td></td>
<td>3</td>
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</tbody>
</table>

17.5
## Electrical Engineering

### Second Semester
- CSE 20221. Logic Design 4
- CSE 20289. Systems Programming 3
- CSE 20112. Data Structures 4
- MATH 20580. Introduction to Linear Algebra and Differential Equations 3.5
- Core Curriculum course + 3

### Junior Year
**First Semester**
- EE 20224. Electric Circuit Analysis 2
- EE 20225. Intro to Electrical Engineering 2
- CSE 30321. Computer Architecture 4
- Free Elective 3
- Core Curriculum course + 3
- CSE Elective 3

### Second Semester
- EE 20234. Electric Circuits 3
- EE 20242. Electronics 4
- CSE 30341. Operating System Principles 3
- ACMS 30440. Probability and Statistics 3
- Core Curriculum course + 3

### Senior Year
**First Semester**
- EE 30444. Signals and Systems 3
- CSE Electives* 6
- Free Elective 3
- DSE 40522. CPEG Capstone 4

**Second Semester**
- CSE 40175. Ethical and Social Issues 3
- CSE Electives* 6
- Core Curriculum course + 3

### Junior Year
**First Semester**
- CSE 30321. Computer Architecture 4
- CSE Elective* 3
- Technical Elective 3
- Core Curriculum course + 3
- CSE Elective 3

### Second Semester
- CSE 30151. Theory of Computing 3
- CSE 30332. Programming Paradigms 3
- CSE 30341. Operating System Principles 3
- ACMS 30440. Probability and Statistics 3
- Core Curriculum course + 3

### Senior Year
**First Semester**
- CSE 40113. Algorithms 3
- CSE Electives* 6
- Technical Elective 3
- Free Elective 3

**Second Semester**
- CSE 40175. Ethical and Social Issues 3
- CSE Electives* 6
- Core Curriculum course + 3

### Total Program Credits:
- 129

### COMPUTER SCIENCE PROGRAM

#### Sophomore Year
**First Semester**
- PHYS 10320. General Physics II 4
- CSE 20110. Discrete Mathematics 3
- CSE 20311. Fundamentals of Computing 4
- MATH 20550. Calculus III 3.5
- Core Curriculum course + 3

**Second Semester**
- CSE 20221. Logic Design 4
- CSE 20289. Systems Programming 3
- CSE 20112. Data Structures 4
- MATH 20580. Introduction to Linear Algebra and Differential Equations 3.5
- Core Curriculum course + 3

- 17.5

#### Electrical Engineering

**Chair:**
Gregory L. Snider
H.C. and E.A. Browe Professor of Electrical Engineering

**Leonard Bettex Chair of Electrical Engineering:**
Daniel J. Costello Jr. (emeritus)

**Frank M. Freimann Professors of Electrical Engineering:**
Gary H. Bernstein; Martin Haenggi; Bertrand Hochwald; Craig Lent; James L. Mert (emeritus); Wolfgang Porod; Alan C. Seabaugh

**Knoth-Hosburgh Chair in Electrical Engineering and Biological Sciences:**
Gregory Timp

**Stinson Professor of Nanotechnology:**
Suman Datta

**Professors:**
- Peter H. Bauer; William B. Berry (emeritus);
- Patrick J. Fay; Thomas E. Fujis; Vijay Gupta;
- Eugene W. Henry (emeritus); Yih-Fang Huang;
- Thomas H. Kosef (emeritus); J. Nicholas Laneman; Michael D. Lemmon; Hai Lin;
- Christine M. Maziar; Roxana Marandachse;
- Gregory L. Snider; Robert L. Stevenson; John J. Uhran Jr. (emeritus)

**Associate Professors:**
- Douglas C. Hall; Anthony Hoffman; Scott Howard; Lei Liu; Ken D. Sauer
- Bettex Collegiate Chair and Associate Professor:
- Christopher Hinkle

**Assistant Professors:**
- David Burghoff; Jonathan Chisum; Thomas O’Sullivan; Ujwal Radhakrishna

**Research Professors:**
- Alexander Mintairov (emeritus); Alexei Orlov;
- Thomas Pratt

**Teaching Professor:**
- R. Michael Schafer

**Concurrent Faculty:**
- Kevin Bower; Adam Czajka; Patrick Flynn;
- Sharan Hu; Siddharth Joshi; Yiyu Shi; Nicholas Zabaras

**Statement of Goals and Objectives.** The goals of the Department of Electrical Engineering’s academic programs are to provide quality education and to foster leading-edge research as means of training highly qualified engineers and leaders of tomorrow, in keeping with the mission of the University of Notre Dame. The educational objectives through which this goal is met are:

- Graduates will successfully participate in the electrical engineering profession.
- Graduates will enroll in and complete high quality MS, PhD, JD, MBA and MD programs.
- Graduates will exploit the breadth in their education to secure a diverse set of initial positions and will demonstrate professional agility in adapting to varied career paths and changing professional landscapes.

To Table of Contents
Dual Degree Programs

Program of Studies. The Department of Electrical Engineering offers programs of study that lead to the degrees of bachelor of science and master of science in electrical engineering and doctor of philosophy. The program leading to the bachelor of science degree is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Program in Electrical Engineering. The four-year curriculum, listed below, includes required and elective courses in the pure and applied sciences, the humanities, and electrical engineering. Emphasis is on the mastery of fundamental principles, with added depth and provision for specialization in the major professional areas of communications, control systems, electronic circuit design and analysis, microelectronics and integrated circuit fabrication, photonics, and signal image processing. Students are individually assisted and advised in their choices of elective courses. Departmental facilities include laboratories for electronics, circuits, electrophysics, control systems, communications, integrated circuit fabrication, photonics, microwave circuit/device characterization, and digital signal/image processing.

Further details about the electrical engineering program may be found on the Web at ee.nd.edu.

The following course schedule is applicable to the students entering the College in 2020.

First Year of Studies
First-year students intending to major in electrical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

Sophomore Year
First Semester
MATH 20550. Calculus III 3.5
PHYS 10320. General Physics II 4
CSE 20133. Introduction to Computing for EE Majors 3
EE 20224. Introduction to Electric Circuit Analysis 2
EE 20225. Introduction to Electrical Engineering 2
Core Curriculum course+ 3
——
17.5

Second Semester
MATH 20580: Introduction to Linear Algebra and Differential Equations 3.5
EE 20242. Electronics 4
EE 20234. Electric Circuits 3
CSE 20221. Logic Design 4
Free Elective 3
——
17.5

Senior Year
First Semester
EE 41430. Senior Design I 3
Electrical Engineering Electives* 6
Free Elective 3
Core Curriculum course+ 3
——
15

Second Semester
EE 41440. Senior Design II 3
Electrical Engineering Electives* 6
Technical Elective† 3
Core Curriculum course+ 3
——
15

Total for four years: 131 semester hours.
* At least one electrical engineering elective must be chosen from EE 30342, 40446, 40453, 40455, 40458, and 40468.
† See "University Core Curriculum" on the first page of the College of Engineering section.

Interdepartmental Engineering

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Electrical Engineering (Non-Departmental). Course descriptions can be found by clicking on the subject code and course number in the search results.

Dual Degree Programs

DUAL DEGREE PROGRAM WITH THE COLLEGE OF ARTS AND LETTERS

Coordinators:
College of Engineering
Michael Ryan
Assistant Dean
College of Arts and Letters
Advising dean for each cohort

Program of Studies. The five-year dual degree program between the College of Arts and Letters and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of arts from the College of Arts and Letters and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 1952, offers students the advantages of both a liberal and a technical education. The student completing one of these combination programs has a background in the humanities and social sciences as well as a degree from one of the programs offered by the College of Engineering. Advisors for the program are available for consultation about the advisability of entering the program and about meeting the particular needs of each student pursuing this program.

Qualified students are eligible to receive modest scholarship support from the John J. Reilly Endowed Scholarship program during their third, fourth, and fifth years of study.

The decision to enter the program ideally should be made prior to beginning the sophomore year, although students can also enter the program at a later stage. Three sets of requirements must be met by students in the program: University requirements, Arts and Letters requirements and Engineering requirements, as the following table indicates.
University Requirements
Six courses in the liberal arts:
Liberal Arts 1. Quantitative Reasoning 3
Liberal Arts 2. Science and Technology 3
Liberal Arts 3. Another Quantitative Reasoning or Science and Technology 3
Liberal Arts 4. Arts and Literature or Advanced Languages and Cultures 3
Liberal Arts 5. History or Social Science 3
Liberal Arts 6. Integration, or a course from an area not yet chosen in 4 or 5 above 3

Theology/Philosophy:
Theology 6
Philosophy/Catholicism and the Disciplines 6
The two-semester Moreau First Year Experience 2

*Please consult the University Requirements section of this Bulletin for details.

Arts and Letters Requirements
College Seminar 3
Literature 3
History 3
Foreign Language* (1–4 courses) 3–14
Fine Arts
Social Science
Major (minimum) 27

42/45

Engineering Requirements
CHEM 10171 4
MATH 10550, 10560, 20550, 20580 15
PHYS 10310, 10320 8
EG 10111, 10112 6

33

Major
approximately 60 credits (see specific major for details)

Engineering Program
Engineering degree program (required courses and program or technical electives) 69–75
Total : 170–179

Schematic Program of Studies
The exact sequence of courses will vary based on the specific majors selected.

First Semester
WR 13100. Writing and Rhetoric 3
Intro to Theology/Philosophy 3
CHEM 10171. General Chemistry: Fundamental Principles 4
EG 10111. Introduction to Engineering Systems I 3
MATH 10550. Calculus I 4
Moreau First Year Experience 1

18

Second Semester
University Seminar 3
(Theo/Philo recommended)+
CHEM 10122. General Chemistry: Biological Processes 3
EG 10112. Introduction to Engineering Systems II 3
MATH 10560. Calculus II 4
PHYS 10310. General Physics I 4
Moreau First Year Experience 1

18

Third Semester
Modern Language 3
PHYS 10320. General Physics II 4
MATH 20550. Calculus III 3.5
Engineering Program† 3
Engineering Program 3

16.5

Fourth Semester
Theology/Philosophy 3
College Seminar 3
Modern Language 3
MATH 20580. Linear Algebra and Differential Equations 3.5
Engineering Program 3
Engineering Program 3

18.5

Fifth Semester
History/Social Science 3
History/Social Science 3
Engineering Program 3
Arts and Letters Major†† 3
Engineering Program 3
Engineering Program 3

18

Sixth Semester
Philosophy/Theology 3
Engineering Program 3
Engineering Program 3
Engineering Program 3
Arts and Letters Major 3
Arts and Letters Major 3

18

Seventh Semester
Literature 3
History/Social Science 3
Engineering Program 3
Engineering Program 3
Engineering Program 3
Arts and Letters Major 3

18

Eighth Semester
Fine Arts 3
Engineering Program 3
Engineering Program 3
Engineering Program 3
Arts and Letters Major 3

18

Ninth Semester
Engineering Program 3
Engineering Program 3
Engineering Program 3
Arts and Letters Major 3
Arts and Letters Major 3

18

Tenth Semester
Engineering Program 3
Engineering Program 3
Engineering Program 3
Arts and Letters Major 3
Arts and Letters Major 3

18

* The University Seminar may be selected from an appropriate history, social science, fine arts or literature course, or the first course in theology or philosophy.

† Students who place out of lower level language courses must take at least one language course at the appropriate level.

†† Courses specified by the student's major engineering department.

†† Courses necessary to fulfill the requirements for a major in the student's major arts and letters department.
 Dual Degree Programs

**Dual Degree Program with the College of Science**

**Coordinators:**
- Michael Ryan
  - Assistant Dean
  - College of Engineering
- Malgorzata Dobrowolska-Furdyna
  - Associate Dean
  - College of Science

**Program of Studies.** The five-year dual degree program between the College of Science and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of science from the College of Science and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 2013, offers students the advantages of the liberal arts aspects of natural science and mathematics education coupled with a strong technical education. Because a student may enter the program from either college, both colleges have agreed to a certain degree of flexibility in allowing students to meet degree requirements. The following guidelines apply to all students intending to pursue this dual degree program, regardless of the student's initial college:

1. Students must complete the degree requirements of both colleges, including University requirements (satisfied only once for both degrees), college requirements (with liberal appropriate substitutions for similar courses), and major requirements (with limited appropriate substitutions for similar content). Students may double-count more than one course between both degrees as appropriate to eliminate unnecessary duplication in course content.

2. Students must earn 30 usable (degree-appropriate) credits past engineering degree requirements. Usable credits are defined as credits—including AP, IB, credit-by-examination and course credits—that are of high enough level that they could be applied to degree requirements. For example, additional AP credits in economics could be used to satisfy a free elective credit in a degree program, but AP credit for statistics (ACMS 10145) cannot be used in either degree program because the class level is lower than the statistics requirements for any degree program in science or engineering.

3. Students must complete sequences of courses in mathematics, chemistry and physics, as described in the course sequences below and the corresponding table on the following page. This requirement ensures that all necessary material is covered through a sequence of classes, and that students do not duplicate content by taking classes from more than one approved sequence.

4. The exact set of courses a student must complete to earn both degrees will be determined by agreement between the appropriate associate/assistant deans of each college and will, naturally, depend on the pair of majors selected. Ordinarily, a student will present a plan of study that incorporates the above rules for approval.

**Approved Math Sequences:**

1. MATH 10550, 10560, 20550, 20580
2. CHEM 10171/11171, 10122
3. MATH 10171/11171, 10172/11172
4. CHEM 10118/11118, 10182/11182

**Approved Chemistry Sequences:**

1. CHEM 10171/11171, 10122
2. CHEM 10171/11171, 10172/11172
3. CHEM 10118/11118, 10182/11182

**Approved Physics Sequences:**

1. PHYS 10310, 10320
2. PHYS 10310, 10320, 20330
3. PHYS 10411, 10424, 20435, 20464

**Dual Degree Program with the Mendoza College of Business**

**Coordinators:**
- Michael Ryan
  - Assistant Dean
  - College of Engineering
- Kristin McAndrew
  - Director of Admissions
  - Master of Business Administration Program

**Program of Studies.** The five-year dual degree program between the Mendoza College of Business and the College of Engineering enables the student to earn the bachelor of science in a chosen field of the College of Engineering and the master of business administration.

This program, instituted in 1991, offers students the opportunity to better integrate study in engineering and in management. The student completing this program has a background in the management sciences, as well as the first professional degree in one of the fields of engineering. Because it is a demanding program, only those students of superior scholastic ability, who have both the aptitude and motivation necessary for the combined graduate and undergraduate program, should apply. Advisors for the program are available for consultation about the advisability of applying for the program and about meeting the particular needs of each student pursuing this program.

This program is open only to those currently enrolled Notre Dame students who have completed three years of a degree program in the College of Engineering. Students interested in the MBA/engineering program should apply to the MBA program during their junior year. To facilitate the application process, students should take the
Graduate Management Admission Test (GMAT) by December of their junior year.

An applicant who is not admitted to the dual degree engineering/MBA program continues in the undergraduate engineering program and completes his or her undergraduate engineering program in the usual four-year time frame.

As a general rule, it is expected that a student accepted to this program will take two courses required for the undergraduate engineering degree during the summer session following the junior year. The following schedule of classes is an example of how a program might be accomplished.

Students in the five-year engineering/MBA program are also required to:

1. Complete a minimum of 48 MBA credit hours and maintain a GPA of at least 3.0 to successfully complete the program.
2. Take only MBA courses in their fourth year and be able to complete 16 MBA credits plus all outstanding engineering degree requirements in the fifth year.
3. Maintain full-time student status (minimum course load of 12 credit hours per semester).

First Year, Sophomore Year, Junior Year:

As outlined for individual engineering degree programs in this Bulletin, 98–104 credit hours.

Summer Session Following Junior Year:

Arts and Letters course+ 3
Arts and Letters course+ 3
Math Review Workshop* 0
Accounting Review Workshop* 0

The MBA curriculum divides each semester into two modules.

Senior Year

36 credits, all MBA courses

First Semester, Module 1:

ACCT 60100, Financial Accounting 2
MBET 60340, Conceptual Foundation of Business Ethics 2
MGT 60100. Statistics 2
MGT 60300. Organizational Behavior 2

First Semester, Interterm Week:

Professional Development Seminar 1
Communications Seminar++ 1

First Semester, Module 2:

ACCT 60200. Cost Accounting 2
FIN 60400. Finance I 2
FIN 60210. Microeconomic Analysis 2
MARK 60100. Marketing Management 2

Second Semester, Module 3:

FIN 70600. Finance II 2
FIN 60220. Macroeconomic Analysis 2
MGT 60900. Strategic Decision Making 2
Free Elective 2

Second Semester, Interterm Week:

Values in Decision Making 1
Required Course (TBD) 1

Second Semester, Module 4:

MGT 60400. Leadership and Teams 2
MGT 60700. Operations Management 2
Free Elective 2

Fifth Year

12 credits, MBA courses and remainder engineering courses

First Semester, Module 1:

MGT 60200. Problem Solving 2
Management Communication Elective 1
(Floating Optional Elective*) 2

* Students have the option to take one additional two-credit-hour elective now or in any remaining module.

First Semester, Module 2:

Ethics Elective 2
Management Communication Elective 2
(Floating Optional Elective 2)

Second Semester, Module 3:

Free Elective 2
Free Elective 2
(Floating Optional Elective 2)

Second Semester, Interterm Week:

(Required Course (TBD) 1)

Second Semester, Module 4:

Free Elective 2
Free Elective 2
(Floating Optional Elective 2)

+See “Arts and Letters Core” on the first page of the College of Engineering section.
++Special one/two-week courses. All other MBA courses are seven weeks in length.

* Occurs during August Orientation

Total for both degrees: 128–134 undergraduate, 48 MBA

One MBA course will be accepted as an elective or technical elective by each College of Engineering program. No more than two MBA courses may be accepted toward an undergraduate degree from the College of Engineering. Students are advised to check specific program requirements.
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<thead>
<tr>
<th>Name</th>
<th>City, State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audrey M. Beckman</td>
<td>Warsaw, Indiana</td>
</tr>
<tr>
<td>Patricia L. Begrowicz</td>
<td>Pittsfield, Maine</td>
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<td>Thomas P. Bernhardt</td>
<td>Austin, Texas</td>
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<tr>
<td>Maureen A. Borkowski</td>
<td>Saint Louis, Missouri</td>
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<td>James P. Bradley</td>
<td>Dallas, Texas</td>
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<td>Angelo J. Bufalino</td>
<td>Lake Forest, Illinois</td>
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<tr>
<td>Michael J. Chmell</td>
<td>Rockford, Illinois</td>
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<tr>
<td>Christy Clarey</td>
<td>Irvine, California</td>
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<tr>
<td>Matthew E. Connors</td>
<td>Hingham, Maine</td>
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<tr>
<td>Timothy J. Connors</td>
<td>Atherton, California</td>
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<tr>
<td>Jacqueline A. Dimples</td>
<td>Cottonwood Heights, Utah</td>
</tr>
<tr>
<td>Patrick E. Dolan</td>
<td>Brigantine, New Jersey</td>
</tr>
<tr>
<td>Dennis O. Doughty</td>
<td>Osprey, Florida</td>
</tr>
<tr>
<td>George R. Dunn, Jr.</td>
<td>Chevy Chase, Maryland</td>
</tr>
<tr>
<td>Anthony F. Earley, Jr.</td>
<td>Bloomfield Hills, Michigan</td>
</tr>
<tr>
<td>John F. Gaither, Jr.</td>
<td>Evansville, Indiana</td>
</tr>
<tr>
<td>Nicholas J. Galassi</td>
<td>Hinsdale, Illinois</td>
</tr>
<tr>
<td>Mark A. Galasso, P.E.</td>
<td>Cableskill, New York</td>
</tr>
<tr>
<td>Donald L. Gothard</td>
<td>Washington, Michigan</td>
</tr>
<tr>
<td>Vincent N. Greggo</td>
<td>Wilmington, Delaware</td>
</tr>
<tr>
<td>Paul J. Guercio, Jr.</td>
<td>Spring, Texas</td>
</tr>
<tr>
<td>Diane G. Gulyas</td>
<td>Johns Island, South Carolina</td>
</tr>
<tr>
<td>Suzanne M. Hull</td>
<td>New Canaan, Connecticut</td>
</tr>
<tr>
<td>James H. Hunt, Jr.</td>
<td>McLean, Virginia</td>
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<thead>
<tr>
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<tr>
<td>John M. Kelly, Jr.</td>
<td>Houston, Texas</td>
</tr>
<tr>
<td>Patricia C. Kilgallon</td>
<td>Boca Raton, Florida</td>
</tr>
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<td>Charles B. Kitz</td>
<td>Farmington, Michigan</td>
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<td>Dennis M. Malloy</td>
<td>Houston, Texas</td>
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<tr>
<td>Kenneth R. Marino</td>
<td>Pittsburgh, Pennsylvania</td>
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Keough School of Global Affairs

The Donald R. Keough School of Global Affairs is the first new school at the University of Notre Dame in nearly a century. In keeping with Notre Dame’s mission to place scholarship in service to the common good, the Keough School advances integral human development through research, policy, and practice; transformative educational programs; and partnerships for global engagement.

Founded in 2014, the Keough School builds on the strengths of existing institutes focused on international research, scholarship, and education at Notre Dame. The Keough School educates and trains global affairs professionals, preparing students for effective and ethical professional leadership in governments, nongovernmental organizations, and the private sector. The Keough School welcomed its first class of students in its Master of Global Affairs in 2017, and it inaugurated a new Supplementary Major in Global Affairs in 2019.

The Keough School offers Notre Dame students a wide range of globe-spanning academic opportunities and programs of study in addition to the extensive study abroad and other options available through Notre Dame International.

Details about the Donald R. Keough School of Global Affairs can be found online at http://keough.nd.edu/.

Global Affairs

Associate Director for Undergraduate Programs:
Denise A. Ayo

Supplementary Major

The supplementary major in Global Affairs, framed within the School’s mission to advance integral human development, offers an interdisciplinary and integrated study of contemporary global issues. It provides students with foundational knowledge of the major political, economic, and social institutions of our world and gives them the analytical tools and skills they need to become active, engaged, and knowledgeable global citizens. Students in the supplementary major complete 5 core courses (15 credit hours) and 5 concentration courses (15 credit hours) in a selected area of study. In addition, they are required to develop cross-cultural competency through proficiency in a second language and participation in an immersive cross-cultural experience.

Core Courses (15 credits)
• KSGA 10001 Introduction to Global Affairs and Integral Human Development
• KSGA 10002 Principles of Economics
• KSGA 30001 International Economics
• A global policy course (attribute code: GLBP)
• A global cultures course (Attribute Code: GLBC)

Concentrations (15 credits)
• Civil and Human Rights
• International Development Studies
• Peace Studies
• Global Policy Studies
• Religion and Global Affairs

The Keough School and its Institutes also support the study of global affairs in relation to many world regions, including Asia, Europe, Ireland, Latin America, and Africa. Within these concentrations, students receive an introduction to the region, its history and culture, and are challenged to consider the transnational networks and global impact that link each region to global issues.

Co-requirements
• Students must take four semesters of a second language. They may place out of lower-level courses but must take at least one language course at the appropriate level during their undergraduate career at Notre Dame.
• Students must spend at least 6 weeks in 1 or more immersive, cross-cultural experience(s). Qualifying experiences include study abroad and international research as well as internships and service learning work, both locally and abroad.

For more information, please contact Denise A. Ayo at dayo@nd.edu.

Asian Studies

Director:
Michel Hockx

Academic Advisor:
Alex Hsu

The Liu Institute for Asia and Asian Studies’ program in Asian Studies introduces students to the complexity of the continent of Asia. Students select courses in a wide variety of fields, such as anthropology, East Asian languages and cultures, economics, film, television, and theatre, history, political science, and psychology. The Liu Institute for Asia and Asian Studies also provides enriching activities such as lectures, films, gatherings, and grant opportunities to students interested in Asia. Students with the supplementary major or the minor in Asian Studies will be very desirable employees of international business or accounting firms, nongovernmental organizations, and service organizations. They will be well prepared for graduate school in a discipline, or for a professional school such as law or business. The supplementary major and the minor in Asian Studies provide recognition of students’ training in this significant aspect of the world.

The Supplementary Major in Asian Studies emphasizes the study of Asia as an integral part of the world today. Students study both historical and contemporary aspects of culture, society, politics, literature, language, religion, etc. Required classes stress interdisciplinary through our intra-university offerings.

Through the interdisciplinary nature of the major, classes draw from a broad range of topics, enabling the student to come away with a holistic and comprehensive study of Asia, including both humanistic and social scientific approaches to study.

Requirements for the Supplementary Major:

Asia-related courses from each of the following disciplines: (Total of 24 credit hours)
• One history: one class in ancient, early, or modern history (3 credit hours)
• One literature/culture (East Asian Languages and Cultures, English) (3 credit hours)
• One social science (anthropology, economics, political science, psychology, or sociology) (3 credit hours)
• One humanities (theology or philosophy) OR an additional literature/culture (3 credit hours)
• Three general electives (can include up to 6 credit hours of language) (9 credit hours)
• One upper-level course taken during the senior year that culminates in a capstone essay (3 credit hours)

The Minor in Asian Studies

Students who are contemplating graduate study in a particular area of the world or a career in international business or government—as well as those who are generally interested in the region—are well served by the minor in Asian Studies. It provides a well-rounded introduction to the world’s most populous region. The minor in Asian Studies is a very appropriate accompaniment to majors in anthropology, East Asian languages and cultures, history, political science, economics, or other arts and letters departments. It is also suitable for students in the Mendoza College of Business, the College of Science, and other Colleges and Schools at our University.

Students should meet with the director of undergraduate studies (DUS) as early as possible in their academic career in order to plan their courses. They should also meet with the DUS each semester to select approved courses.

Requirements for the Minor:

Asia-related courses fulfilling each of the following: (Total of 15 credit hours)
• Four courses from at least three different disciplines (history, literature/culture, humanities,
European Studies

Interim Director: Clemens Sedmak

The Nanovic Institute for European Studies is dedicated to enriching the intellectual culture of Notre Dame by creating an integrated, interdisciplinary home for students to explore the evolving ideas, cultures, beliefs, and institutions that shape Europe today. In addition to offering a range of grant programs and events, the Institute supports an interdisciplinary curriculum in European Studies serving students across the University through two curricular paths: a Minor in European Studies (MES), and a Concentration in Transnational European Studies (TES) for undergraduate students in the Keough School. Questions can be directed to the Institute’s advising team.

The Minor

The MES is designed for students who are looking for a flexible way to frame their coursework in European studies and write a capstone project. The Minor in European Studies has the following requirements (15 total credits):

- Three upper-division elective courses from two different departments, chosen from courses carrying the MESE attribute (9 credits)
- One course in an approved European language at the Intermediate II level (3 credits)
- A capstone essay on a topic in European studies, to be completed in close consultation with a faculty member with expertise in European studies (3 credits).

Funding Opportunities
The Institute offers a wide range of undergraduate grant programs. All undergraduates at Notre Dame wishing to travel to Europe to conduct research, learn a language, carry out internships or service projects, or embark on other academic initiatives are encouraged to visit the Institute’s website for up-to-date information about grant opportunities for students across the University and throughout the academic year.

For more information, consult the Institute’s website at nanovic.nd.edu. Questions may be directed to the Institute's student programming and advising staff via contact information available on the website.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Asian Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

International Development Studies

Director: Steve Reifenberg
Associate Director: Holly Rivers

The goal of the Kellogg Institute for International Studies’ minor in International Development Studies (IDS) is to provide undergraduate students with both the opportunity to learn about and contribute to international development. IDS will provide context and an academic foundation for students to analyze the dynamics of development across the globe as well as help students develop skills for effective engagement in a complex world.

Development studies is interdisciplinary in nature, so students are required to take courses in a variety of disciplines. This equips students with a broad lens through which to view and investigate development challenges. Students from all colleges and departments are encouraged to enroll.

The IDS minor prepares students for a variety of post-graduate options related to international development, including graduate work in development studies, volunteer work or employment in the field, ranging from international and advocacy organizations, businesses, consulting firms, and policy and research groups. Regardless of what career path IDS students follow, the breadth and diversity of academic and fieldwork training help prepare them to apply their learning from the classroom to the world around them.

The IDS minor was founded by the Kellogg Institute’s Ford Program in Human Development Studies and Solidarity, and today the minor is managed by the Kellogg Institute, working closely with the Ford Program. To supplement their course work, students can take advantage of the many opportunities made available by the Kellogg Institute and the Ford Program: a calendar of events, grants and internship opportunities, an annual student-led human development research conference, and other resources.

Requirements:
A central component and requirement of the IDS minor is a field-based research project in the so-called “developing” world, allowing students to contribute to the Ford Program’s mission of seeking solutions to real world challenges by examining the causes and consequences of extreme poverty. This research project will normally be conducted the summer after a student’s junior year.

Additionally, the minor in International Development Studies consists of 15 credit hours:

- Gateway Course (3 credit hours): Introduction to International Development Studies
- This course is offered in the fall and spring semesters and will normally be taken during sophomore year.

Research Methods Course (3 credit hours):
- Students are expected to take a research methods course through the designated IDS courses.

Two Electives (6 credit hours):
- Qualifying elective courses are listed each semester in the Schedule of Classes under IDS.
- When possible, students are encouraged to take an elective outside a student’s major college.
- One of these electives must be outside a student’s major.
- With approval, one course may be taken abroad.

Capstone Seminar (3 credit hours):
- This course will be taken the fall semester of senior year.
- Each student will write a senior essay based on his or her field research.
- Bringing together their unique experiences and disciplinary perspectives, students will discuss and critique each other’s work.

For more complete information about the minor in International Development Studies, please consult our website at kellogg.nd.edu/students/ids. Questions about the minor can be directed to Holly Rivers at hrivers@nd.edu

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject International Development Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.
Irish Studies

Director:
Patrick Griffin
Director of Undergraduate Studies:
Mary O’Callaghan

The Keough-Naughton Institute for Irish Studies provides students with a unique opportunity to explore Ireland’s extraordinary tradition in literature (in both the English and Irish languages) and distinctive historical development, including its influence on the history of the United States. The Irish Studies faculty includes leaders in several fields, including English, history, film, television, and theatre, anthropology, American studies, marketing, politics, psychology, medieval studies, classics and Irish language and literature. The Irish Studies Program also organizes a calendar of intellectual and cultural activities in which undergraduates are encouraged to participate; visitors to campus have included Seamus Heaney and John Hume, both Nobel Prize winners, and other leading Irish writers and public figures, including Mary McAleese, two-term president of Ireland.

Minor
The core of the program is a minor in Irish Studies. The minor helps students develop their understanding of Irish society, culture, and politics through both course work and firsthand experience of Ireland. To qualify for the minor, students must demonstrate proficiency in Irish language (by taking IRST 10101, 10102, and 20103) and complete four three-credit Irish Studies courses; students may choose to undertake independent study with a faculty fellow in lieu of one of the four courses. The topic must be agreed upon before the independent study begins. Courses may be taken on Notre Dame’s campus, at Dublin’s O’Connell House, and through the Kylemore Abbey Global Center; courses from other study abroad programs may be substituted with permission. All qualifying classes are listed in the Schedule of Classes under IRST.

Dublin Program
The home of the Dublin program is the Keough Naughton Notre Dame Centre in O’Connell House in the historic heart of Ireland’s capital. Each semester, roughly 35 Notre Dame students enroll for courses in the Centre and at Trinity College Dublin, University College Dublin, and the National College of Art and Design. The program includes several field trips and a variety of social and cultural activities. Students taking the minor in Irish Studies have a distinct advantage when applying for this highly competitive program.

Irish Internships
The Keough-Naughton Institute for Irish Studies annually awards Keough Irish Internships, which place undergraduates in internship positions in Dublin relating to Irish politics and commerce, culture, and society. In the past, students have been placed in the Irish parliament, government departments, the Irish Film Centre, and various social service organizations. Most internships last for a period of seven weeks.

For further information, students should consult Mary O’Callaghan, mocalla2@nd.edu, director of undergraduate studies.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Irish Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

Peace Studies

Director of Undergraduate Studies:
Laura Miller-Griff
Assistant Director:
Anna Van Overberghe

Peace studies at the University of Notre Dame is centered at the Kroc Institute for International Peace Studies. Profiles of the peace studies faculty and information about activities in peace studies can be found on the Kroc Institute’s website at kroc.nd.edu.

Program of Studies
Peace studies is defined as an interdisciplinary field of study that draws on diverse academic disciplines to understand the causes of violent conflict; develop nonviolent ways to prevent and resolve war, genocide, terrorism and gross violations of human rights; and build peaceful and just societies.

As a liberal arts curriculum, peace studies links scholarship to practice and empowers students to become effective citizens with a global perspective. It develops critical thinking skills, strengthens research and writing ability, teaches specific tactics in areas such as conflict resolution and social change, and challenges students to develop their knowledge into new ways of thinking and acting in the world. Peace studies provides students with the capacity to imagine and build the global community as it ought to be (rather than simply how it is) and with the skills to work toward that vision.

The Undergraduate Program in Peace Studies offers two curriculum options: the Supplementary Major in Peace Studies (24 credits) and the Interdisciplinary Minor in Peace Studies (15 credits). Both require students to complete an introduction course, a mid-level course on peacebuilding, and a capstone research and writing seminar. The remaining coursework consists of electives selected from the program’s course catalog. Electives are designated as either core electives or support electives.

The Supplementary Major in Peace Studies requires successful completion of eight (8) courses: the three required courses and five courses selected from a list of approved peace studies electives. At least two of the five electives must be core electives. The curriculum for the supplementary major is:

Required Courses
IIPS 20101 Introduction to Peace Studies 3 cr
IIPS 33101 Perspectives on Peacebuilding 3 cr
IIPS 43101 Peace Studies Senior Seminar 3 cr

Peace Studies Electives
2 core IIPS courses 6 cr
3 additional IIPS courses (core or support) 9 cr

The Interdisciplinary Minor. The Interdisciplinary Minor in Peace Studies requires successful completion of five (5) courses: the three required courses and two courses selected from a list of approved peace studies electives. The curriculum for the minor is:

Required Courses
IIPS 20101 Introduction to Peace Studies 3 cr
IIPS 33101 Perspectives on Peacebuilding 3 cr
IIPS 43101 Peace Studies Senior Seminar 3 cr

Peace Studies Electives
2 additional IIPS courses (core or support) 6 cr

The required courses may not be taken concurrently. Introduction to Peace Studies is a pre-requisite for Perspectives on Peacebuilding, and both of those foundational courses are pre-requisites for Peace Studies Senior Seminar. The senior seminar course may only be taken during the senior year.

Elective courses may be completed at any point, and they may be taken concurrently with required courses. However, students are advised to take Introduction to Peace Studies first, before completing other work in the curriculum. Courses taken abroad count only as peace studies electives and may not substitute for any of the required courses.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Institute for International Peace Studies. Course descriptions can be found by clicking on the subject code and course number in the search results.

To Table of Contents
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HAL CULBERTSON
Associate Dean for Operations
IRIS MA
Assistant Dean for Academic Affairs
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BRENNAN SMITH
LU SUN
LAURA TAYLOR
College of Science

The University of Notre Dame awarded its first bachelor of science degree in 1865. Before that time, courses had been taught in mathematics (from 1842), in biology (from 1844), and in chemistry (from 1850). In 1867, a program in general science was formulated. Subsequently, specialized programs were added, leading to the degree of bachelor of science in botany and in zoology (both now covered by one degree in biological sciences), in environmental sciences, in biochemistry, in chemistry, in physics, in mathematics, and in preprofessional studies.

Departments of the College of Science

The Department of Applied and Computational Mathematics and Statistics is housed in Crowley Hall, in the academic center of campus. The facilities include office space for faculty members, graduate students and postdoctoral associates, as well as space for these department members to collaborate with undergraduate students in research and educational activities. The department has access to the computing resources of the Center for Research Computing and computing facilities dedicated to department research groups.

The Department of Biological Sciences, located in the Galvin Life Science Center, has well-equipped laboratories for undergraduate and graduate research, spanning the wide realm of the life sciences, across scales of complexity—from cells and organs to whole organisms and ecosystems. The facilities include controlled-environment rooms; an optics facility containing confocal microscopes, scanning and transmission electron microscopes; molecular analysis facilities for DNA sequencing, microarrays, cell sorting; and extensive data storage and retrieval equipment.

The Hank Center for Environmental Science provides more than 20,000 square feet of state-of-the-art research space for aquatic, terrestrial, and environmental studies that includes greenhouses, wet laboratories, and a field sample processing room.

The Freimann Life Science Center provides additional laboratories, vertebrate animal care, and associated specialized modern research facilities to serve the expanding needs of life science research at Notre Dame.

The Jordan Hall of Science contains 16 state-of-the-art biology laboratories for teaching undergraduate and graduate life science laboratory courses. In addition, the collections of museum specimens, including the Greene-Nieuwland Herbarium and the Museum of Biodiversity, are available for research and teaching, housed in superb facilities in Jordan Hall.

The Department of Chemistry and Biochemistry, located in Nieuwland Science Hall and Stepan Hall of Chemistry and Biochemistry, has laboratories devoted to research in several areas of chemistry; physical, inorganic, organic, and biochemistry. The laboratories are equipped with all necessary facilities for undergraduate students, graduate students, postdoctoral investigators, and faculty. Undergraduate researchers have access to seven high-field NMR spectrometers and three state-of-the-art single crystal X-ray diffractometers, plus many other pieces of equipment such as infrared, ultraviolet, Raman, mass spectrometer; photoelectron spectroscopy; potentiostats; analytical and preparative HPLC and GC equipment; special apparatus for studying mechanisms and rates of reactions; and cell culture facilities. For theoretical work, two large parallel cluster supercomputers are available. The facilities of the Radiation Research Laboratory are used by some faculty of the chemistry department for research in physical chemistry.

The new Jordan Hall of Science houses all of the undergraduate teaching laboratories for chemistry and biochemistry. Included are spacious facilities for introductory and organic chemistry; analytical, physical, and inorganic chemistry; and biochemistry. The building also contains a new NMR spectrometer. Also within Jordan Hall are two large lecture rooms specially designed for teaching introductory science courses, along with a 150-seat multimedia visualization center.

The Department of Mathematics is housed in Hayes-Healy Center/Hurley Hall, conveniently located in central campus. The facilities for undergraduate and graduate instruction and research in mathematics include a first-rate research library; a faculty room; offices for the faculty, postdoctoral investigators, and other visitors, graduate students, and staff; several research seminar and conference rooms; and several large classrooms with state-of-the-art media capability.

The Department of Physics, located in Nieuwland Science Hall, has teaching facilities and laboratories for both undergraduate and graduate research. There are facilities for experimental work in astrophysics, biophysics, condensed-matter physics, elementary particle physics, and nuclear physics. There are three atomic spectroscopy laboratories, and some additional use is made of facilities at Argonne National Laboratory. Elementary particle experiments are done at the Stanford and Fermi national laboratories, and at CERN in Geneva, Switzerland. Detector development for the major accelerators is also being done in the department. The Nuclear Science Laboratory has two accelerators dedicated to nuclear astrophysics. This facility is home to the second largest low-energy nuclear physics program in the country. A variety of solid state facilities are available for the study of metals, high Tc superconductors, and semiconductors. Off-site facilities at Argonne, the National High Magnetic Field Laboratory, and the National Institutes of Standards and Technology are also heavily used. Notre Dame is a partner in the Large Binocular Telescope project. This will be one of the most capable facilities in the world for cutting-edge cosmology and astrophysics research. Research is conducted in many major areas of theoretical physics, including all of the above areas as well as statistical mechanics, field theory, general relativity, and astrophysics. The department has a substantial machine shop and research library and a variety of staff technicians. Many faculty members and research groups have computing facilities, and all have access to the Office of Information Technologies' very large computers.

Jordan Hall of Science houses all of the undergraduate teaching laboratories for physics, including spacious facilities for introductory mechanics, electricity and magnetism, and modern physics. Within Jordan Hall are also a laser and optics lab and an advanced laboratory for physics majors. The building also hosts a rooftop observatory equipped with a dozen small telescopes for introductory astronomy courses, along with a separate dome housing a large, research-quality telescope for physics and astronomy students. Jordan Hall is also home to a 150-seat digital visualization theatre that serves as a planetarium for a variety of astronomy and astrophysics courses.

The Department of Preprofessional Studies is located in the Center for Health Sciences Advising in the Jordan Hall of Science. This center centralizes the advising process for all University students interested in the health professions. All courses for students enrolled in the preprofessional program and collegiate sequence programs are provided by the other departments of the College of Science and the other colleges of the University.

Undergraduate Education

The aim of the program of undergraduate education in the College of Science is to produce intellectually able graduates who are grounded in the broad fundamental principles of the basic sciences, versed in the advanced concepts of their chosen scientific discipline and educated in the humanistic and social studies. Each graduate should be a good scientist in his or her own field; a fully developed person, aware of his or her responsibilities to society and prepared to participate fruitfully in the affairs of society.

To Table of Contents
Education in science at Notre Dame is a coordinated program involving the basic sciences, the chosen advanced science, and the humanistic and social studies, including theology and philosophy. In this education, the student should acquire a thorough, integrated, and broad understanding of the fundamental knowledge in his or her field, a competence in orderly analytical thinking, and the capacity to communicate ideas to others, orally and in writing. This system of education is so arranged to develop in each student the desire and habit of continuing to learn after graduation, advancing over the years to higher levels of professional and personal stature and keeping abreast of the changing knowledge and problems of his or her profession.

Emphasis is placed on fundamental principles so that the students can develop abilities to apply these principles to the solution of new problems never before encountered by society, to the discovery of new things and to the invention of devices not learned about in books. Notre Dame stresses basic concepts useful in later learning rather than masses of particular facts and data that can better be found in books at the time of need.

Curricula and Degrees

The College of Science offers curricula leading to the degree of bachelor of science in each of six undergraduate departments:

- Applied and Computational Mathematics and Statistics
- Biological Sciences
- Chemistry and Biochemistry
- Mathematics
- Physics
- Preprofessional Studies

The following are degree programs offered by these departments:

- Applied and Computational Mathematics and Statistics
- Biochemistry
- Biochemistry combined with Neuroscience
- Biological Sciences
- Chemistry
- Chemistry combined with Business
- Chemistry combined with Computing
- Chemistry combined with Neuroscience
- Environmental Sciences
- Mathematics
- Mathematics (combined with other programs)
- Neuroscience and Behavior
- Physics
- Physics-in-medicine
- Preprofessional Studies
- Science-Business
- Science-Computing
- Science-Education
- Statistics

These degree programs are described in detail in later sections of this Bulletin.

See also the bachelor of science degree programs offered by the College of Engineering:

- Computer Science
- Environmental Geosciences
- Environmental Geosciences

Each College of Science student must enroll in the department of his or her major beginning with the sophomore year; however, a student may change primary majors in the College of Science at any point up until the last drop day of the 7th semester in consultation with their advisor and dean. Concentrations, second and supplementary majors, and minors may be changed at any time; provided, however, that a student’s request to change his/her curriculum generally will be denied if the requested change would require the student to remain at the University beyond 8 semesters.

The College of Science maintains a website at science.nd.edu. Further information related to programs offered by the college may be found at that location.

Listed below are the allowed options for students interested in double science majors, double majors between colleges, second majors in the College of Science, and supplementary majors and minors in the College of Arts and Letters.

- Students pursuing one of these combination programs must have superior scholastic ability and be formally accepted by the dean of both colleges involved. Approval will not be granted if there is substantial overlap between the two programs.

- Note: Courses taken toward the completion of an additional major, supplementary major or minor may not also be counted toward the student’s other major, supplemental major, supplementary major or minor.

- Double Science Majors. In certain instances, students will have the option of pursuing majors in two departments of the College of Science. Details on the double science major option and lists of combinations that are normally approved are found under “Special Programs,” later in this section of the Bulletin.

- Dual Degree. Notre Dame students pursuing majors in two of the undergraduate colleges may qualify for a five-year dual-degree program.

- The requirements for a dual degree generally are as follows: The student completes all of the university requirements, all of the requirements for both colleges, all of the requirements for both majors, and the total number of degree credits specified for a dual degree in the two colleges. While the total number of hours required does depend on the two major programs, the minimum required total number of degree credits is set to be 30 degree credits beyond the college total for the college with the greatest required number of degree credits.

- Double Majors in Two Colleges. Qualified Notre Dame students pursuing majors in one of the other undergraduate colleges or schools may add another major in the College of Science. Additionally, qualified Notre Dame students pursuing a major in the College of Science may also add another major in one of the other undergraduate colleges or schools.

- The requirements for a double major between colleges generally are as follows: The student completes all the University requirements, the requirements of his or her college or school, and the requirements of both majors. In general, a single course may not satisfy requirements for both majors.

- Supplementary Majors and Minors. Qualified Notre Dame students pursuing majors in the College of Science may add a supplementary major or minor. Options include programs offered through the College of Arts and Letters and the Environmental Geosciences minor offered through the College of Engineering.

- Science students may not add the Arts and Letters Preprofessional Studies supplementary major.

- Supplementary Majors, Minors, and Concentrations in the College of Science. In the College of Science, the term "second major" is used for a supplementary major. Three departments offer a secondary major program specifically for students in the other colleges: mathematics as a second major, physics as a second major, and environmental sciences as a second major. The Applied and Computational Mathematics and Statistics department offers supplementary majors for students with a primary major in other departments in the College of Science, as well as other colleges. For details, see the departmental sections of this Bulletin.

- Three departments in the College of Science offer concentration programs: Applied and Computational Mathematics and Statistics, Mathematics and Physics. For details, see the departmental sections of this Bulletin.

- Combination Five-Year Program with the Mendoza College of Business. The College of Science and the Mendoza College of Business have established a competitive cooperative program in which a student may simultaneously earn a bachelor of science and a master of business administration degree. The program is structured so that the student who has completed the three years of a science bachelor’s degree program, if accepted, completes the master of business administration and the bachelor of science in a major in the College of Science in a summer session and two subsequent academic years.

- Students who wish to pursue this program should have a superior scholastic record in their major program and must make application to, and be accepted by, the MBA program.

- The general sequence of courses in the five-year Science-MBA program may be found under “Dual Degree Program with the Mendoza College of Business,” later in this section of the Bulletin.
University and College Requirements

A minimum of 124 credit hours is required for graduation from the College of Science. A minimum of 60 credit hours must be in science; however, each department may specify more than 60 credit hours for any of its programs. A minimum cumulative and major GPA of 2.0 is required for graduation.

All College of Science majors must fulfill University requirements. The specifics of University Requirements are listed in this Bulletin on pages 15–17.

Six courses in the liberal arts:
1. Quantitative Reasoning
2. Science and Technology
3. An additional course in Quantitative Reasoning or Science and Technology
4. Arts and Literature or Advanced Languages and Cultures
5. History or Social Science
6. Integration, or a course from an area not yet chosen in 4 or 5.

Four courses exploring explicitly Catholic dimensions of the liberal arts:
1. A foundational Theology course
2. A developmental Theology course
3. A Philosophy course
4. An additional Philosophy course or a Catholicism and the Disciplines course.

Two courses in writing:
1. A University Seminar
2. A Writing and Rhetoric course, or another writing-intensive course.

The two-semester Moreau First Year Experience.

* One of these requirements must be designated as a University Seminar course typically numbered as 13180–13189.

In addition, all College of Science majors must take courses in:
- Chemistry (10171 and 10172 or 10122) or 10181, 10182
- Mathematics (10350, 10360 or 10550, 10560 or 10850, 10860)
- Physics (10310, 10320 or 10411, 10424, 20435 or 20210, 20220).

The appropriate sequence for a student depends on the student’s major.

The College of Science requires language proficiency through intermediate level. “Intermediate proficiency” is defined differently in each of the languages, depending on the complexity of the language and the intensity of the course. Students may complete the language requirement by either completing a course taught at intermediate level or by demonstrating proficiency through placement examination. The college office maintains a list of language courses at intermediate level. (See the college website, science.nd.edu under Academic Information Frequently Asked Questions.)

Students with no previous background in a language should start with a beginning-level course. They take typically either nine credits over a three-semester period, eleven credits over a three semester sequence, or two semesters of an intensive language sequence (10 credits total). Students with Advanced Placement or SAT II credit may receive up to eight credit hours of language toward their degree. If for some reason more than eight credits appear on the transcript, only eight credits will count toward the required 124 credits. Students who arrive with some background in the language they elect, but without AP or SAT II credit, will be placed by departmental examination but will receive no credit hours.

The College of Science will count a maximum of one credit hour from the following types of activity courses:
- Band (Marching and Concert)
- Orchestra
- Chorale
- Glee Club
- Liturgical Choir
- Folk Choir
- Music Lessons and Ensembles
- Dance
- Debate
- Science in the Classroom

Additionally, a maximum of six credit hours of upper-level (30000- or 40000-level) ROTC courses can be counted toward the 124-credit-hour requirement. These courses will be counted as free electives.

The College of Science works with the Center for Social Concerns (see page 26 of the Bulletin) to develop relevant, community-based opportunities. Science majors may count as general electives up to 3 credits for approved Summer Service Learning Program courses (e.g., THEO 33936) or Social Concerns Seminars (e.g., CSC 33951).

Not all science courses will count toward degree credit or science elective credit for science majors. The survey science courses offered as options for non-science majors for their University science requirement will not count as a science elective or toward the minimum science credit hour requirement. Because of overlap in content with required courses for science majors, many of these courses will also not count toward the degree credit requirement (see “Science Degree Credit,” later in this section of the Bulletin).

Some major programs have a science elective requirement. For a course to be a science elective, it must meet the following rules: (1) It is offered through one of the departments of the College of Science or through the college itself. (2) It is major’s level; that is, other science majors are required to take this course to meet a major requirement or it has a prerequisite course that is offered for science majors, or the Bulletin description for the course states that it is a science elective in the College of Science. Finally, the departments may place additional restrictions on allowed science electives, e.g., for biological sciences major one science elective must be a non-biology course.

All College of Science courses offered by a major program must be taken at the University of Notre Dame. If a student wants to take a course outside Notre Dame for credit toward the Notre Dame degree, prior approval of the dean's office must be obtained. This does not apply to the courses taken by a transfer student prior to attending Notre Dame.

Advising. All Notre Dame science majors have been assigned an advisor in the department of their major. All advisors are members of the faculty of the College of Science. In some departments, the director of undergraduate studies for the department advises all students. In others, the director of undergraduate studies or the department office may be contacted to find out the name of the student’s advisor. A complete list of names of advisors is kept on the science website.

Notre Dame students who have questions concerning the choice of a major or considering a change of major are urged to make appointments with the advisors of the departments involved. Students needing help choosing from similar majors may request an advising appointment with the associate or assistant dean of undergraduate studies of the College of Science, 215 Jordan Hall. Any Notre Dame student who is considering a health profession can receive advising in the Center for Health Sciences Advising in 219 Jordan Hall.

Student Organizations and Activities

In addition to participation in University-wide student activities, the undergraduate students of the College of Science may participate in activities directly related to science, including the undergraduate departmental science organizations: the Biology Club, the Notre Dame Chapter of Student Affiliates of the American Chemical Society, the Mathematics Club, the Society of Physics Students, the PreMed Club (preprofessional), the Prevet Club, the Science-Business Club, and the Notre Dame Chapter of Alpha Epsilon Delta (premedical honorary fraternity).

Student Council. The Student Council of the College of Science is composed of representatives of the majors of the College of Science. The student council serves as the official body representing the undergraduate students before the administration of the College of Science.
Student Awards and Prizes

The Dean's Award. Presented to a graduating senior in the College of Science in recognition of exemplary academic achievements, leadership, and service to society.

The Dean's Research Award. Presented to a graduating senior in the College of Science in recognition of exceptional research that advances scientific knowledge in their field through publications and presentations.

Outstanding Senior Biological Scientist(s). To the senior(s) who have/have demonstrated the most promise in the biological sciences as evidenced by both academic performance and research participation.

Outstanding Biology Student Leader Award. Seniors nominated for this award must be exemplary student leaders in the Department of Biological Sciences. The student will have made outstanding contributions, through their leadership and service, to advance the interests of other students in the department.

Paul F. Ware, M.D., Excellence in Undergraduate Research Award. The top student nominated for the Outstanding Biological Scientist award will be chosen for the Paul F. Ware award, the highest honor given to a graduating senior in the department. Leadership and/or service in the department, college, or university are also key qualifications for this award.

Outstanding Environmental Scientist Award. Seniors nominated for this award must be exemplary students in the Environmental Science major with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory that emphasizes any aspect of environmental science. The student must have made a significant intellectual contribution to their lab, typically evidenced by a co-authored publication and/or national or regional conference presentation.

Mr. and Mrs. Frank McDonald Undergraduate Research Award. Seniors nominated for this award must be exemplary undergraduate researchers with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory. The student must have made a significant intellectual contribution to their lab, resulting in a co-authored publication and/or a national or regional conference presentation. A successful candidate would also have been exemplary in all honors activities including the honors seminars, the graduate course, and the honors thesis.

Royal Society of Chemistry Certificate of Excellence. For outstanding achievements in chemistry or biochemistry.

Norbert L. Wisch Ph.D. Award. Given to a chemistry or biochemistry major in the junior year for outstanding achievement in academics and research.

Outstanding Biochemist Award. For leadership, academic achievements, research and scholarship in biochemistry.

Outstanding Chemist Award. For academic and research achievements in chemistry as an undergraduate.

William R. Wischerath Outstanding Chemistry Major Award. For academic achievements of a graduating senior chemistry major.

Chemistry-Education Award. For academic achievements in preparation for teaching of chemistry in a secondary education system.

ACS Division of Organic Chemistry Outstanding Senior Organic Chemistry Student. For senior students who have displayed a significant aptitude for organic chemistry in coursework and research accomplishments. Awardees receive a certificate of recognition from the ACS Division of Organic Chemistry.

Chemistry & Biochemistry Leadership Award. For a senior that has devoted substantial time and energy to create sustainable programs or other changes that fundamentally improve the student experience in the Department of Chemistry & Biochemistry.

The General Electric Prizes for Honors Majors in Mathematics. Awarded to senior honors majors in the Department of Mathematics who, in the opinion of the members of the faculty, excelled in mathematics during their undergraduate career.

The General Electric Prizes for Majors in Mathematics. A similar award to senior majors.

The George Koletis Award in Mathematics. An award established by friends of the late Prof. George Koletis, for a graduating senior who excelled in mathematics and contributed notably to the spirit de corps of the mathematics student body.

The Aumann Prize for First Year Students in Mathematics. A prize given by Ms. Monika Aumann in honor of her father, Prof. Georg Aumann, awarded on the basis of a competition among First Year honors mathematics students.

The Norman and Beatrice Haaser Mathematics Scholarships. These scholarships, made possible by the generosity of Professor and Mrs. Haaser, are awarded to worthy, needy students majoring in mathematics.

R. Catesby Taliaferro Competition for Sophomore Mathematics Honors Students. Friends and students of the late Professor Taliaferro established this prize, which is awarded to a sophomore mathematics major on the basis of an essay submitted by the student.

J & C Sophomore Award in Mathematics. Exemplary performance in mathematics classes by a non-honors math major sophomore female or minority (African-American, Asian, Hispanic, Native American) student.

Neuroscience and Behavior Senior Awards for Academic Excellence

Outstanding Undergraduate Research Award. Seniors nominated for this award must be exemplary undergraduate researchers with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory. The student must have made a significant intellectual contribution to their lab, typically evidenced by a co-authored publication and/or national or regional conference presentation.

Outstanding Undergraduate Teaching Award. Seniors nominated for this award must have consistently demonstrated excellence in teaching, either through undergraduate teaching assistantships, community education, mentorship, or other direct teaching experience. The student will have demonstrated commitment to teaching excellence through multiple semesters (minimum of 2) of superior teaching performance, as demonstrated by the quality of teaching reviews, faculty or community mentor recommendation.

Outstanding Undergraduate Leadership and Service Award. Seniors nominated for this award must be exemplary student leaders in the Neuroscience and Behavior major and/or the University at large. The student will have made outstanding contributions, through their leadership and service, to advance the interests of other students in the major and/or make significant impact on the larger Notre Dame or South Bend communities.

Universal Scholar Award. Seniors nominated for this award demonstrate remarkable capability across multiple domains (research, teaching, leadership, service), while simultaneously demonstrating the character traits and behaviors that align with the teachings of Catholic Social Tradition: The Common Good, Life and Dignity of Human Persons, Correlation of Rights and Responsibilities, Preferential Option for the Poor, Care for Creation, and Solidarity.

Outstanding Senior Physics Major. This award is given to the outstanding senior physics major, who, in the judgment of the departmental faculty, shows the...
most promise for a distinguished career in physics. Course grades, the opinion of those who have taught the candidates, and any research performance are considered in making the award.

Paul Chagnon Award. An award to be given to a senior physics major for demonstrated character and leadership and for service to the University, the physics department, and to his or her fellow physics majors.

Physics Outstanding Undergraduate Research Award. A monetary award given for excellence in research to an undergraduate physics major.

DiNardo Award. To the outstanding junior preprofessional student.

Emil T. Hofman Scholarships. To six outstanding students pursuing premedical studies.

J.C. Lungren, M.D., Scholarships. Awarded to three outstanding science preprofessional students.

The Lawrence H. Boldinger Award. To seniors in the preprofessional program who excel in scholarship, leadership, and character.

The Patrick J. Niland, M.D., Award. A monetary award given to a preprofessional studies senior to purchase books for the first year of medical school.

The Samuel Cinnell, M.D., Award. To an outstanding senior in preprofessional studies who exemplifies high academic achievement and uncompromising integrity within the program.

The Rev. Joseph L. Walter, C.S.C., Award. To a senior with a keen social awareness who shows great promise as a concerned physician.

Special Opportunities

Glynn Family Honors Program. In the fall of 1983, the University inaugurated an honors program for a small number of outstanding students in the College of Arts and Letters and the College of Science. A limited number of students with academic intents for each college are identified at the time of admission. Although selection criteria include the promise of outstanding academic performance as demonstrated by standardized test scores and high school performance, the program is looking for more than mere academic ability. It hopes to identify students with a deep intellectual curiosity.

The program offers honors sections to fulfill most of the University and college requirements in the students’ freshman and sophomore years. At present, there is the yearlong Honors Seminar (satisfying the writing and literature requirements). Honors Calculus, Honors Philosophy, Honors Theology, Honors Biology, Honors Physics, and an array of Honors Social Science courses. Since these course are restricted to honors students, they are smaller than non-honors sections and are usually taught in a seminar format. The teachers for honors sections are chosen from the most outstanding teachers in each college. After the first year, each student’s academic work will be mainly centered in his or her major field (or fields) of study, but two or more honors electives are also taken during these years. In the fall of the senior year, there is an “Honors Thesis/Research Seminar,” which is followed by the “Senior Seminar” in the spring. The fall seminar is intended to be a spur to the students’ capstone project, whereas the spring seminar brings the honors students from diverse majors back together for some concluding topical discussions. All honors students will also be expected to complete a special six-hour senior research honors project in their major field of study. In science, this is the culmination of a research project begun earlier, and in arts and letters, it is a two-semester project culminating in a thesis. Those writing senior theses work individually under the direction of a faculty advisor of their choosing in their major field. Funds are available for research projects during summers either at Notre Dame or other universities.

In addition to the more narrowly academic features of the honors program, students will be offered various opportunities for broadening personal, cultural, and spiritual growth. Regular colloquia, informal discussions, and cultural excursions are available.

Further information on the structure and content of the Honors Program may be obtained by contacting Prof. Chris Kolda or Prof. Paul Weithman, 323 O'Shaughnessy Hall, Notre Dame, IN 46556, 574-631-5398.

The Environmental Research Center (UNDERC), a University facility, is composed of approximately 7,500 acres located primarily in the Upper Peninsula of Michigan. Research is conducted at UNDERC by undergraduate as well as graduate students on a variety of environmental problems, including the manipulation of ecosystems. Internships are available to support student participation in BIOS 35502, 35503, and 35504 at UNDERC each summer semester.

Study Abroad. Students from any of the majors in the College of Science may participate in one of the University of Notre Dame’s study abroad programs. Science students who go abroad generally do so in one of the two semesters of their junior year. Students applying to medical or dental school during the summer following their junior year (to enter after their senior year) should not study abroad in the spring semester of their junior year. Science students interested in study abroad should discuss their plans with their advisor and with the associate dean, Sr. Kathleen Cannon, 248 Nieuwland Science Hall. Further information can be obtained through Study Abroad, 105 Main Building.

Applied and Computational Mathematics and Statistics

Chair: Bei Hu
Associate Chair: Jonathan Hauenstein
Director of Graduate Studies: Fang Liu
Director of Undergraduate Studies: Alan Hubeiner
Full Professors: Jonathan Hauenstein; Bei Hu; Jun Li; Fang Liu; Yongtao Zhang
Associate Professors: Martina Bukac; Lizhen Lin; Alan Lindsay; Robert Rosenbaum; Zhiliang Xu
Assistant Professors: Stefano Castruccio; Guosheng Fu; Alexandra Jilkin; Dong Quan Ngoc Nguyen; Daniele Schiavazzi; Giuseppe Vinci; Daren Wang
Full Teaching Professors: Roya Ghaseddini; Alan Huebner; Roger Woodard
Associate Teaching Professor: Molly Walsh
Assistant Teaching Professors: Shane Leib; Michael Pruitt; Victoria Weber

Program of Studies. The partnership of applied mathematics, computational mathematics and statistics brings the tools of modeling, simulation and data analysis to bear on real-world problems, producing solutions with the power to predict and explain complex phenomena. These methods, often applied computationally, are being used in a wide variety of areas in business, engineering, the natural sciences, and the social sciences.

The Department of Applied and Computational Mathematics and Statistics (ACMS) offers programs of study leading to the bachelor of science degree in applied and computational mathematics and statistics and to the bachelor of science in statistics. Computational skills, which are often required to solve real-world problems, will be developed continuously throughout the curriculum. For many students, significant work in an area of application will complement their core studies. Graduates of the program will be well prepared for the following post-graduate opportunities.

- Further training in professional masters or doctoral programs in applied mathematics or statistics;
- Graduate study, at the masters or doctoral level, in bioinformatics or computational biology;
- Employment in technical fields requiring skills in statistics and computation;
• Employment and further study in actuarial science and quantitative methods in business and economics.

In addition to the core bachelor of science in ACMS major, ACMS offers a concentration in biological sciences, which will prepare students for further study or employment in computational biology, bioinformatics, ecological modeling, or epidemiology.

ACMS also offers supplementary majors in applied and computational mathematics and statistics and in statistics. Students in numerous areas of study can benefit from advanced study in applied and computational mathematics and statistics. This is true for students in business and the social sciences as well as those in the natural sciences and engineering. These supplementary majors are well suited for these students.

BACHELOR OF SCIENCE WITH A MAJOR IN APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

The requirements for the degree include courses that develop a strong foundation in the methods of applied mathematics and data analysis, while allowing students to also take courses in a wide variety of application areas. The specific requirements for the bachelor of science in applied and computational mathematics and statistics, beyond the university and college requirements are as follows.

Chemistry (CHEM 10171, 10122 or CHEM 10171, 10172) ¹
Physics (PHYS 10310, 10320) ¹
Calculus I, II (MATH 10550, 10560) ¹
Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)
Scientific Computing (ACMS 20210)
Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Statistical Methods and Data Analysis I (ACMS 30600)
Mathematical/Comp Modeling (ACMS 40730)
or Mathematical/Comp Modeling in Neurosci (ACMS 40740)
or Stochastic Modeling (ACMS 40760) ⁶
Numerical Analysis (ACMS 40390)
ACMS electives (6 credits in ACMS courses numbered 30000 and above) ², ⁵
Genetics (BIOS 20303)
Cellular Biology (BIOS 30341) or Ecology (30312)
Biology Elective (3 credits in BIOS which has BIOS 10172 as a prerequisite)
Elective in Biology, Chemistry or Physics (3 credits)

These requirements total 40 credits in ACMS and MATH and 79 credits in Science.

ACMS Sample Curriculum:

First Year
First Semester
MATH 10550. Calculus I 4
CHEM 10171. Chemical Principles 4
PHYS 10310. General Physics I 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Second Semester
MATH 10560. Calculus II 4
CHEM 10172 or 10122 4
PHYS 10320. General Physics II 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Sophomore Year
First Semester
ACMS 20550. Applied Math Methods I 3.5
ACMS 20620. Applied Linear Algebra 3
Language 3
University Requirement 3
Elective 3

Second Semester
MATH 10560. Calculus II 4
CHEM 10172 4
PHYS 10320. General Physics II 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Junior Year
First Semester
ACMS 30600. Stat. Methods & Data Analysis I 3.5
ACMS 40390. Numerical Analysis 3
Language 3
University Requirement 3
Elective 3

Second Semester
ACMS Elective 3
ACMS/MATH Elective 3
University Requirement 3
Science Elective 3
Elective 3

Senior Year
First Semester
Mathematical/Comp Modeling (ACMS 40730)
or Mathematical/Comp Modeling in Neurosci (ACMS 40740)
or Stochastic Modeling (ACMS 40760) ⁶
or Nonlinear Dynamical Systems (ACMS 40630) ⁶
ACMS Elective 3
Elective 9

Second Semester
ACMS Elective 3
Electives 9

ACMS/BIOS Sample Curriculum:

First Year
First Semester
MATH 10550. Calculus I 4
CHEM 10171. Chemical Principles 4
BIOS 10171. Biology I: Big Questions 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Second Semester
MATH 10560. Calculus II 4
CHEM 10172 or 10122 4
PHYS 10320. General Physics II 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

To Table of Contents
### Sophomore Year

**First Semester**
- ACMS 20550. Applied Math Methods I 3.5
- ACMS 20620. Applied Linear Algebra 3
- CHEM 20273/21273 4
- Language 3
- University Requirement 3
- **Total** 16.5

**Second Semester**
- ACMS 20750. Applied Math Methods II 3.5
- ACMS 20210. Scientific Computing 3.5
- ACMS 30530. Introduction to Probability 3
- Language 3
- University Requirement 3
- **Total** 16

### Junior Year

**First Semester**
- PHYS 10310. General Physics I 4
- BIOS 30341 or 30312 3
- Language 3
- University Requirement 3
- **Total** 16

**Second Semester**
- BIOS 20303. Genetics 3
- PHYS 10320. General Physics II 4
- Biology/Chemistry/Physics Elective 3
- University Requirement 3
- Elective 3
- **Total** 19

### Senior Year

**First Semester**
- ACMS 40390. Numerical Analysis 3
- Mathematical/Comp Modeling (ACMS 40730) or Mathematical/Comp Modeling in Neurosci (ACMS 40740) 3
- or Stochastic Modeling (ACMS 40760) 3
- or Nonlinear Dynamical Systems (ACMS 40630) 6
- Biology Elective 3
- ACMS Elective 3
- Elective 3
- **Total** 15

**Second Semester**
- ACMS Elective 3
- ACMS Elective 3
- Electives 6
- **Total** 12

### Notes:
1. Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.
2. Some ACMS courses, ACMS 30440 in particular, are not acceptable as electives for the major. The list of acceptable courses for ACMS majors can be obtained from the student's advisor.

### Bachelor of Science with a Major in Statistics

The requirements for the degree include courses that develop a strong foundation in the methods of applied mathematics and data analysis, while allowing students to also take courses in a wide variety of application areas. The specific requirements for the bachelor of science in statistics, beyond the university and college requirements are as follows.

**First Year**
- MATH 10550. Calculus I 4
- CHEM 10171, 10172 4
- PHYS 10310, Chemical Principles I 4
- University Requirement 3
- University Requirement 3
- Moreau First Year Experience 1
- **Total** 19

**Second Semester**
- MATH 10560. Calculus II 4
- CHEM 10172 or 10122 4
- PHYS 10320. General Physics II 4
- University Requirement 3
- University Requirement 3
- **Total** 19

**Sophomore Year**
- ACMS 20550. Applied Math Methods I 3.5
- ACMS 20620. Applied Linear Algebra 3
- Language 3
- University Requirement 3
- Elective 3
- **Total** 15.5

**Second Semester**
- ACMS 20750. Applied Math Methods II 3.5
- ACMS 20210. Scientific Computing 3.5
- ACMS 30530 Intro Probability 3
- Language 3
- University Requirement 3
- Elective 3
- **Total** 19

**Junior Year**
- ACMS 30600. Stat. Mthds Data Anal. 3.5
- ACMS/MATH Elective 3
- University Requirement 3
- Elective 3
- **Total** 15.5

**Second Semester**
- ACMS 30550. Mathematical Statistics 3
- ACMS Statistics Elective 3
- University Requirement 3
- Science Elective 3
- Elective 3
- **Total** 15

**Senior Year**
- ACMS Statistics Elective 3
- Science Elective 3
- Elective 9
- **Total** 15

**Second Semester**
- ACMS Statistics Elective 3
- Science Elective 3
- Elective 9
- **Total** 15

### Statistics Sample Curriculum:

**First Year**
- **First Semester**
  - MATH 10550. Calculus I 4
  - CHEM 10171. Calculus I 4
  - University Requirement 3
  - University Requirement 3
  - Moreau First Year Experience 1
- **Second Semester**
  - MATH 10560. Calculus II 4
  - CHEM 10172 or 10122 4
  - PHYS 10320. General Physics II 4
  - University Requirement 3
  - University Requirement 3
  - Moreau First Year Experience 1

### Notes:
1. Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.
SUPPLEMENTARY MAJOR IN STATISTICS

The supplementary major in statistics requires 37 credits in ACMS and Mathematics. The specific requirements are as follows.

- Calculus I, II (MATH 10550, 10560)
- Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)
- Scientific Computing (ACMS 20210 or approved alternative computing course in science)
- Applied Linear Algebra (ACMS 20620)
- Introduction to Probability (ACMS 30530)
- Mathematical Statistics (ACMS 30550)
- Statistical Methods and Data Analysis (ACMS 30600)
- ACMS Statistics electives (6 credits)

Difference from the full major. The full Statistics major requires 43 credits in ACMS and MATH courses. This supplementary major requires fewer statistics elective and one fewer ACMS elective.

Double counting issues. A student is permitted to double count Calculus I and II for a first major and this program. A student whose first major requires Calculus III and Ordinary Differential Equations is exempt from ACMS 20550 and 20750, but must complete an additional 6 credits of electives in ACMS. The same principle applies to any other courses required by a first major and this program.

SUPPLEMENTARY MAJOR IN APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

The supplementary major in applied and computational mathematics and statistics requires 37 credits in ACMS and Mathematics. The specific requirements are as follows.

- Calculus I, II (MATH 10550, 10560)
- Introduction to Applied Mathematical Methods, I, II (ACMS 20550, 20750)
- Scientific Computing (ACMS 20210)

Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Mathematical Statistics and Data Analysis I (ACMS 30600)
Mathematical/Comp Modeling (ACMS 40730)
or Mathematical/Comp Modeling in Neurosci (ACMS 40740)
or Stochastic Modeling (ACMS 40760)
Numerical Analysis (ACMS 40390)
ACMS electives (3 credits in ACMS courses numbered 30000 and above, except those overlapping in content with one of the above)

1. One of the courses satisfies the modeling course requirement. If more than one course is taken, the other can be counted as an ACMS elective.

HONORS IN ACMS

Junior majors in ACMS may apply for the departmental honors program to receive the designation “Honors in Applied and Computational Mathematics and Statistics.”

Here are the requirements:
- A minimum of Cum GPA of 3.5.
- Complete a minimum of two semesters in undergraduate research ACMS 48498 during the junior or senior year, potentially including a summer semester.
- Complete an undergraduate thesis, ACMS 48500.
- Presentation of the thesis in a seminar or a conference, on campus or outside campus.

Before the end of the junior year, students interested in the Honors option must apply to the director for undergraduate studies, who will make suggestions to students for an appropriate advisor. The subject matter should be in an area of expertise of at least one member of the department. The student will work with the advisor to complete a thesis, which must be signed off by the advisor and then submitted to the Director of Undergraduate Studies by April 15 of the senior year. If approved, the student will receive credit for ACMS 48500, Undergraduate Thesis.

The undergraduate thesis must go beyond what is found in an undergraduate course, and present a novel approach to a subject.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Applied & Computational Mathematics and Statistics. Course descriptions can be found by clicking on the subject code and course number in the search results.

Program of Studies. The Department of Biological Sciences offers programs of study leading to the degrees of bachelor of science with a major in biological sciences or bachelor of science with a major in environmental sciences, master of science in biological sciences and doctor of philosophy. Also offered is a second major in environmental sciences for students in the College of Arts and Letters or in the College of Business Administration.

Program in Biological Sciences. The Department of Biological Sciences at Notre Dame is committed to understanding the fundamental mechanisms by which living systems operate. The Department is highly interdisciplinary and in excellent position to fulfill the promise of the new integrative approach
to biology. Basic research is at the center of our endeavors and fuels and inspires our teaching and training. We seek solutions to human health and environmental crises facing our society—such as finding treatments, cures and prevention for human diseases, maintaining biodiversity on land and in our natural water sources, ensuring an adequate supply of food and fresh water, and reversing the effects of pollution and climate change.

Research in the department spans the wide realm of the life sciences, across scales of complexity—from cells and organs to whole organisms and ecosystems—and across foci as varied as infectious disease, cancer, organ regeneration, climate change and biodiversity. United through the ultimate goals of fostering human and environmental health, we believe that real-world solutions require integrative biological inquiry and multidisciplinary collaboration. Our department serves as a hub connecting different academic units across campus and different universities worldwide, through life science-related investigation and problem solving.

Students choosing an undergraduate major in biological sciences will be prepared for graduate study (M.S., Ph.D., MD/Ph.D.) leading to a research career, or for admission to medical, veterinary, and other professional schools. Graduates with a bachelor's degree may enter careers in industry, government, or health-related research laboratories. Those who wish to teach at the elementary or secondary level should be sure to include required education courses such as those offered through Saint Mary's College.

Policy Statement on the Use of Organisms in Biological Sciences Teaching Laboratories. Some laboratory courses offered by the Department of Biological Sciences may involve the use of living or preserved organisms. Instructors use these animal specimens in cases where this is deemed necessary for teaching important biological concepts and principles. Students who have concerns about the use of organisms in classes must, prior to registering, submit a request for alternate materials to the course instructor. It is up to the discretion of the instructor(s) as to whether and how non-organism alternatives may be substituted for biological materials in classes. Students permitted to use alternate materials are responsible for the same knowledge and application as their classmates and may be required to complete examinations that involve the inspection or handling of biological specimens.

Biology Courses. The biology courses included in this Bulletin are those reasonably expected to be offered several times to every semester during the next four years. However, changes may occur as faculty add new courses or drop those with little demand. Courses without laboratories are indicated as lecture only.

The requirements in biological sciences include courses from a basic five-core sequence, laboratory courses and sufficient numbers of BIOS electives to complete the 41-credit-hour requirement. All majors are strongly encouraged to complete the sequence Biological Sciences I and II (BIOS 10171–10172) in their first year to ensure the completion of all requirements in four years. Students may begin the core in sophomore year; however, they will be at a considerable disadvantage in scheduling requirements in the two remaining years; they also will have one year less to explore their interests in biology.

BACHELOR OF SCIENCE WITH A MAJOR IN BIOLOGICAL SCIENCES

Director of Undergraduate Studies: David J. Veselik

The biological sciences majors take the following basic sequence of courses in the College of Science:

General Chemistry (CHEM 10171 and 20274)
Organic Chemistry (CHEM 10172 and 20273)
Physics (PHYS 20210–20220)
Calculus (MATH 10350–10360 or 10550–10560)

There are six components to the biology core requirement, consisting of courses in the following areas:

Core I: Introductory Biology Sequence
Biology I: Big Questions (BIOS 10171)
Biological Investigations Laboratory (BIOS 11173)*
Core II: Molecules to Ecosystems (BIOS 10172)
Research Experience in Biology Laboratory (BIOS 11174)*

Core III: Evolution (3 credits)
Core IV: Cell Biology and Physiology (3 credits)
Core V: Ecology and the Environment (3 credits)
Core VI: Laboratory Courses

Students complete five laboratory courses. Three semesters of undergraduate research can fulfill one of the five laboratory courses.

Note that select overseas courses that have been approved for science credit may satisfy the Core II through VI requirement if approved by the Director of Undergraduate Studies in Biological Sciences before taking the class.

TRACKS

The Department of Biological Sciences offers eight tracks within the Biological Sciences major. Tracks provide structure to electives to assist students’ development in their fields of interest, and provide experience in a field within biology for students seeking admission to graduate school, medical school, or other programs/jobs.

Each track requires at least 14 credits, two of which can be used for Undergraduate Research. These credits are in addition to the core requirements of the Biological Sciences major listed above. Note that courses listed in more than one track will not count twice.

Tracks include:

- Biomedical Sciences
- Cell and Developmental Biology
- Computational Biology
- Ecology and Environment
- Evolution and Genomics
- Infectious Disease and Global Health
- Integrative Biology
- Medical Neurobiology

For full descriptions of each track, see biology.nd.edu/undergraduate/programs-of-study/

BIOS ELECTIVES

The minimum required credits in the core including labs is 23. An additional 18 credits of electives in biological sciences are chosen to complete the required total of 41 credits. 4-7 All biological sciences majors are encouraged to include non-science among their free electives.

The minimum required credits in the core including labs is 23. An additional 18 credits of electives in biological sciences are chosen to complete the required total of 41 credits. 4-7 All biological sciences majors are encouraged to include non-science among their free electives.

Notes:

1. Students are required to take a total of five laboratories; two of the five labs will be part of Core I, and the remaining three of the five laboratories are chosen among the Core II through Core V and/or BIOS electives, including 50000- and 60000-level courses. Thus, there are two required “named” BIOS labs and three additional elective BIOS labs. Students who conduct a minimum of three semesters of undergraduate research (BIOS 48498) in a laboratory or research group at Notre Dame and earn a minimum of 3 credits (i.e., 3 x 1.0 credit), may substitute those research semesters for one of the five required labs.

2. Select non-BIOS major-level College of Science courses (i.e., those taken to meet science-major requirements and not among those designated as “Recommended University electives”) that are not being used to fulfill other specific graduation requirements can be chosen with the consent of the director of undergraduate studies for the Department of Biological Sciences and counted toward the BIOS elective credits. While majors are allowed to take one 3-credit, non-BIOS lecture course and have that count toward the 41 required credits, students may also include one non-BIOS lab if it is required for that non-BIOS lecture and have that laboratory satisfy one of the six required laboratories. For example, Physical Geology (SC 20110, ENVG 10110/20110) has a required
laboratory, and majors who choose BIOS electives based on their environmental or ecological interests may elect to take Physical Geology for a total of 4 credits toward the 41 required credits. Majors who might have transferred into BIOS from BCHM and had taken the required biochemistry (CHEM 30341) lecture and laboratory course will be allowed to count both the lecture and laboratory toward the 41 credits. The same would be true of other relevant science courses (e.g., analytical chemistry, physical chemistry) as approved by the director of their major and the associate dean of the College of Science.

3. Undergraduate Research (BIOS 48498) and Directed Readings (BIOS 46497) count toward the 41-credit biological sciences requirement; however, only a maximum of two credits per semester per course and a combined total of six credits from these two courses may be counted in fulfilling the 41-credit requirement. A maximum of two credits of BIOS 37495 (Teaching Practicum) may be included in any combination of these six credits. A maximum of only nine credits in these courses may be used toward graduation; however, additional credits do remain on a student's permanent transcript record.

Sample Curriculum: The sample curriculum for the four-year program listed below is only one of a number of ways a student can complete all the requirements for a biology major. Students should discuss their specific interests with their departmental advisor and plan their semesters accordingly. Alternative sample curricula can be developed with the assistance of the biology advisor.

Note that this sample curriculum assumes that no language CE credits are included.

First Year
Fall Semester
BIOS 10171/BIOS 11173 (Lab #1)  4
MATH 10350 or 10550  4
CHEM 10171 (or 10181)  4
University Requirements  3
WR 13100  3
Moreau First Year Experience  1
——  19

Spring Semester
BIOS 10172/BIOS 11174 (Lab #2)  4
MATH 10360 or 10560  4
CHEM 10172 (or 10182)  4
University Requirements  3
Theology or Philosophy  3
Moreau First Year Experience  1
——  19

Sophomore Year
Fall Semester
Core II: Genetics  3-4
Elective BIOS lab  1-2
CHEM 20273/21273  4
Theology/Philosophy  3
Language  4
——  15-16

Spring Semester
Core III: Evolution
Core IV: Cell Biology and Physiology
Elective BIOS Lab
CHEM 20274/21274
Theology/Philosophy
Language
Elective BIOS Lab
——  17

Junior Year
Fall Semester
Core V: Ecology and the Environment
Physics 20210, 21210
Free Elective
Theology/Philosophy
Language
Elective BIOS Lab
——  17

Spring Semester
BIOS Elective
BIOS Elective
Physics 20220, 21220
Fine Art/Literature
——  13

Senior Year
Fall Semester
BIOS Elective
BIOS Elective
Free Elective/Ways of Knowing
Free Elective/Ways of Knowing
Free Elective
——  15

Spring Semester
BIOS Elective
BIOS Elective
Free Elective/Ways of Knowing
Free Elective/Ways of Knowing
Free Elective
——  15

Need a minimum total of 124 credits.

1 Students who begin with the CHEM 10181–10182 sequence and select BIOS as their major would complete the four-semester sequence with CHEM 20273–20274.

2 One of these courses must be a University Seminar.

3 While not required, many students choose to take a supporting 3-credit non-BIOS science course that counts toward the required 41 credits in their major.

| SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ANY BIOLOGICAL SCIENCES MAJOR |
|---------------------------------------------------------------|-------------|
| Biological Sciences*                                          | 41          |
| Chemistry (10171–10172 or 10181–10182)                       | 8 First year |
| Physics (20210–20220 with labs)                               | 8 Sophomore |
| Mathematics (10350–10360 or 10550–10560)                      | 8 Junior    |
| Total Science                                                 | 73          |
| Liberal Arts 4–6                                             | 9 First year |
| Philosophy**                                                 | 6           |
| Theology**                                                   | 6           |
| WR 13100                                                     | 3 First year |
| Language                                                     | Intermediate Level Competency (3) |
| Free Electives                                               | 24+         |
| Moreau First Year Experience                                 | 2 First year |

* It is essential for prospective biology majors to begin their general biology courses in the first year to schedule all required core curriculum courses within a four-year period.

** One of these courses must be a University Seminar.

+ Minimum number of free electives based on the assumption that intermediate-level competency in language was achieved by taking a minimum of one three-credit course.

Majors often have time to incorporate 20 or more free elective credits (i.e., a second major or minor) into their four-year course selection.
4. Proposal writing
3. Research presentations (posters and talks)
2. The publication process
1. Thesis writing

Senior year topics (offered each fall):
1. Thesis writing
2. The publication process
3. Graduate fellowship and graduate school personal statements
4. Attend biology seminars and discuss research methods and results with faculty
5. Research presentations.

UNDERC FIELD BIOLOGY PROGRAMS

Seven-credit programs for undergraduates that emphasize field biology are offered at the University’s Environmental Research Centers (Michigan and Montana). The programs entail course work, group research projects, and an independent research project. Application to the programs occurs in the fall of the sophomore and junior years and enrollment is limited by housing at each location. If selected, students enroll in BIOS 35501 during the spring semester and BIOS 35502 during the summer. To participate in the Montana (BIOS 35503) or other programs (BIOS 35504, 35505), one must first participate in the Michigan program.

ENVIRONMENTAL SCIENCES

Director of Undergraduate Studies:
Dominic Chaloner

Program in Environmental Sciences. All life, including humans, directly depends on the functioning of Earth’s ecosystems. Further, it has become apparent that human activities have altered Earth’s environments. Factors such as pollution, invasive species introductions, anti-biotic resistance, and global climate change can all be traced to human activity. Increasing the knowledge and awareness of the link between humans and the environment is one of the most important endeavors of the twenty-first century.

The environmental sciences major stresses interdisciplinary knowledge and logic. The curriculum is designed to expose students to a scientific understanding of our environment from biological, chemical, and physical perspectives. Particular emphasis is placed on understanding how humans interact chemically and biologically with the environment. Material and energy resource limitations, chemical and thermal pollution, and effects of environmental pollution on public health are major considerations within the environmental sciences curriculum. Emphasis is also placed on understanding interactions between human societies and the environment from social, ethical, economic, anthropological, and governmental points of view. Students are also encouraged to strengthen their mathematical and computational skills and to participate voluntarily in environmentally oriented research projects or summer internships.

Concentrations in Earth Science. With this collaboration students will explore how geologic processes affect humans and how human activity is...
changing earth systems, studying a range of topics including earthquakes, volcanic activity, global climate change, subsurface transport of toxic heavy metals, carbon sequestration, and safe disposal of nuclear waste. The Earth Science concentration program combines classroom, laboratory and field studies, and all students are encouraged to conduct independent research under faculty supervision. The flexibility of the undergraduate program allows students to switch to this concentration if they have followed either an engineering or science track during their first or even their second years.

An undergraduate major in Environmental Science with a concentration in Earth Science prepares a student for graduate study (M.S., Ph.D.) in many aspects of geological and environmental science, as well as for admission to a variety of professions. Graduates with a B.S. degree may enter careers in diverse areas such as state geological offices, the National Park Service, oil and mining industries, environmental consulting, and government national research laboratories or policy offices.

The First Major. College of Science students who major in Environmental Sciences will earn the degree of bachelor of science. Students following the Environmental Sciences first major program complete a total of 69 credits of science.

The Second Major for Arts and Letters and Business: Most students in the College of Arts and Letters or in the Mendoza College of Business may participate in the Environmental Sciences Program as a second major. Second majors are required to complete a minimum of 37 credits of science. Students considering this program should investigate options brought to a first major by adding course work in environmental sciences. For example, students majoring in government and in environmental sciences could consider postgraduate study or careers in public policy. Students majoring in economics and in environmental sciences would have a good background for the developing field of environmental economics. A second major in Environmental Sciences also complements majors in the other sociological fields of anthropology, psychology, or sociology. Similarly, business students will likely find environmental sciences to be useful background when working with local or federal governments on issues of environmental compliance or when considering the impact of business decisions on the environment (environmental assessment). All students are urged to discuss their long-range career plans with advisors in both majors.

Relationship with Other Programs: The Environmental Sciences Major Program has a special collaborative relationship with the Science, Technology, and Values (STV) Concentration program housed in the Reilly Center in O’Shaughnessy Hall. Select courses required of environmental sciences first majors are also cross-listed as STV courses. Thus, students in the STV program from across the university are expected to benefit in the curricular endeavors of the Environmental Sciences Program. Environmental sciences first majors often enroll in the STV program. (Environmental science students with flexibility in their program often have room to complete an STV concentration by taking STV courses beyond those required by the first major or university requirements.) However, arts and letters students with second majors in environmental science will be encouraged to participate in further interdisciplinary course work through the STV concentration. Second majors are especially encouraged to take the capstone course, SC 40491, Current Topics in Environmental Science, provided it completes that second program.

BACHELOR OF SCIENCE WITH A MAJOR IN ENVIRONMENTAL SCIENCES

All environmental sciences first majors take the following courses in science:

Introductory Biology (BIOS 10171–10172 and 11173–11174)
Chemistry (CHEM 10171 and 10172)
Calculus (MATH 10350–10360)\(^1,2,3\)
Planetary Earth (SC 20110/21110)
Physics (PHYS 20210–20220)
Ecological Biostatistics (BIOS 40411)\(^4\)
General Ecology (BIOS 30312 and 31312)
Chemistry Elective\(^5\)
Current Topics in Environmental Science (SC 40491)

Students also will choose science electives chosen from an approved list,\(^6\) completing a required minimum total of 69 credits in science.

Also required for the major are the following non-science courses:

One philosophy or theology University requirement must be in the area of ethics. An ethics course with emphasis on environmental biology or life science issues, i.e., Environmental Ethics or Science, Technology, and Society, or other approved arts and letters courses.

Students must take Introduction to Microeconomics (ECON 10010 or 20010) as a social science University requirement.\(^7,8\)

Students are also urged to choose their electives from a recommended list of arts and letters courses.\(^9\)

Requirements for the program are summarized in the table in this section.

Notes:

1. Equivalent or higher-level sequences in mathematics may be substituted, e.g., MATH 10850–10860 for MATH 10350–10360.
2. Students interested in the area of ecological modeling are strongly urged to take MATH 10550–10560 for their mathematics requirement. Other mathematics courses should be taken as science electives.
3. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350–10360 or MATH 10550–10560. Students having taken MATH 10250, 10110 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found later in this section of the Bulletin.)
4. Students transferring into the ES or ES2 major, or transfer students who have previously taken a statistics course equivalent to ACMS 20340, MAY BE allowed to have this course count for BIOS 40411 (Biostatistics) with the permission of the ES Director. Students will be allowed to substitute ACMS 20340, or an equivalent statistics course (e.g., PST 30100) as ES or ES2 majors in exceptional cases with the permission of the director of their major and the associate dean of the College of Science.
5. The 4-credit chemistry elective requirement is satisfied by either one additional course in organic chemistry (CHEM 20273) or Inorganic Chemistry (CHEM 20243) or by Analytical Chemistry (CHEM 30333, 31333) or by an alternative 4-credit CHEM course as approved by the director of their major and by the associate dean of the College of Science. Students are also allowed to take the 3-credit CHEM 10122 lecture or CHEM 20294 with the understanding that if/when a laboratory is established for that course, they will be required to take that lab prior to graduation.
6. The following are examples of many approved science electives for this program:

- Botany (BIOS 30304) or at St. Mary’s Evolution (BIOS 30305)
- The History of Life (BIOS 30310)
- Genetics (BIOS 20250 or 20303)
- Principles of Microbiology (BIOS 30401)
- Animal Behavior (BIOS 30407)
- Aquatic Ecology (BIOS 30420)
- Stream Ecology (BIOS 40527)
- Numerous other BIOS courses as designated by the ES director, including 60000-level graduate courses are accepted.

Environmental Chemistry (CHEM 20204)
Further chemistry electives (from Note 6 above)
Second course in general chemistry (CHEM 20274)
Principles of Biochemistry (CHEM 40420)
Computer Programming and Problem Solving (MATH 20210)
Calculus III (MATH 20550)
Introduction to Linear Algebra and Differential Equations (MATH 20580)
Differential Equations (MATH 30650)
Topics in Computing

Historical Geology (SC 20120)
Sedimentation and Stratigraphy (SC 30530)
### Sample Curriculum (B.S. Degree Majors):

**First Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>Biology I and lab 4, Calculus A 4, General Chemistry I and lab 4, University Requirement 3, University Requirement 3, Moreau First Year Experience 1</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>Biology II and lab 4, Calculus B 4, Organic Chemistry I and lab 4, University Requirement 3, University Requirement 3, Moreau First Year Experience 1</td>
</tr>
</tbody>
</table>

**Sophomore Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>Planet Earth and lab 4, General Ecology and lab 4, Language I 4, Microeconomics 3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>Chemistry Elective and lab 4, Biostatistics 4, Language II 4, General Elective 3</td>
</tr>
</tbody>
</table>

**Junior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>Physics for Life Sciences I and lab 4, University Requirement 3, Language III (intermediate level) 3, Science Elective #1 3, Science Elective #2 3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>Physics for Life Sciences II and lab 4, Science Elective #3 3, University Requirement 3, General Elective 3</td>
</tr>
</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>Current Topics (SC 40491) 3, Science Elective #4 3, Science Elective #5 3, University Requirement 3, General Elective 3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>Science Elective #6 3, General Elective 3, General Elective 3, General Elective 3</td>
</tr>
</tbody>
</table>

* Ideally, students who decide to major in environmental sciences before beginning their first year should take BIOS 10171–10172. This will allow for an additional year of relevant science and other electives to be included in their total curriculum. See notes accompanying BIOS 10171–10172.

**Honors.** ES majors can participate in the Biological Sciences honors program. See page 146 for more information.

**ENVIRONMENTAL SCIENCES MAJOR WITH A CONCENTRATION IN EARTH SCIENCES**

The following outlines the course requirements (totaling 34 credits) for Earth Sciences concentration:

- CE 20520. Environmental Mineralogy
- CE 20320. Environmental Aquatic Chemistry
- CE 20300. Global Change, Water & Energy
- CE 20530. Sedimentation and Stratigraphy
- CE 30300. Geomorphology for Engineers and Earth Scientists
- CE 34540. Petrology of Earth Materials
- CE 30560. Dynamic Earth
- CE 40300. Geochemistry
- CE 40350. Environmental Microbiology
- CE 40381. Environmental Isotope Geochemistry
- CE 45200. Spring Field Trip
- CE 45340. Field Trip

**First Year** (see core environmental sciences major)

<table>
<thead>
<tr>
<th>Semester</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Semester</strong></td>
<td>Planet Earth and lab 4, General Ecology and lab (BIOS 31312) 4, Language I 3, Topics in Environmental Science 3, University Requirement 3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td>Global Change, Water &amp; Energy 3, Biostatistics and tutorial 4, Chemistry Elective 3, Language II 3, University Requirement 3</td>
</tr>
</tbody>
</table>

**To Table of Contents**
The total required course work requires a minimum total of 32 credits in science beyond the University math requirement.

Note, the same policy applies for Environmental Sciences first and second majors: All College of Science courses specified by the major program must be taken at the University of Notre Dame. (An exception is made for any science courses taken for this major through an approved Notre Dame study abroad program.)

**Sample Curriculum (Second Majors):**

Students should remember that all science major programs require course work that builds upon prerequisites and thus require careful planning. A sample curriculum for second majors is given below. Note: Only the courses for the second major are listed.

**First Year***  
First Semester  
CHEM 10171 Chemical Principles and Lab 4  
Second Semester  
CHEM 10122 or CHEM 10172 3/4

**Sophomore Year**  
First Semester  
General Biology I (10171) 3  
Second Semester  
General Biology Lab (11173) 1

**Junior Year**  
First Semester  
SC 20110 Planet Earth 4  
Second Semester  
Statistics or Biostatistics 3/4  
CHEM or SC/CE requirement** 3

**Senior Year**  
First Semester  
BIOS 30312, 31312. General Ecology 4  
BIOS or CE or PHYS or SC Elective*** 3  
Second Semester  
Course selection(s) to complete second major, as needed

*One of these courses must be a University Seminar 13180–13189

** Assumes intermediate-level competency in language was achieved by taking a minimum of one three-credit course

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**MINOR IN SUSTAINABILITY**

**Director of the Minor in Sustainability:**  
Rachel Novick

**Advisory Committee:**  
Samantha Salden (Chair)  
Jon Coleman  
Alan Hamlet  
Jason McLachlan  
Jessica McManus Warnell  
Samuel Miller  
John Sitter  
Jennifer Tank  
Laura Walls

The Minor in Sustainability is a course of study for undergraduates from broadly diverse academic disciplines. It examines the footprint of humanity on Earth’s systems and ways to reduce that footprint to achieve social well-being and environmental protection. Faculty from multiple Colleges teach the principles and practices of sustainability from varied perspectives to provide a unique and dynamic curriculum. The curriculum is designed to augment

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**SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ENVIRONMENTAL SCIENCES MAJOR**

<table>
<thead>
<tr>
<th>Credit</th>
<th>Biological Sciences</th>
<th>Chemistry</th>
<th>Geology</th>
<th>Mathematics</th>
<th>Physics</th>
<th>SC 40491</th>
<th>Science Electives</th>
<th>Total Science</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16</td>
<td>12</td>
<td>4</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>18</td>
<td>69</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Language Intermediate-Level Competency (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University Requirement 3</td>
</tr>
</tbody>
</table>

**Universities: University Requirement 3**

**Theology* 6**

<table>
<thead>
<tr>
<th>* One of these courses must be a University Seminar 13180–13189</th>
</tr>
</thead>
</table>

**Free Electives 28**

**Total: 124**

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**ENVIRONMENTAL SCIENCES AS A SECOND MAJOR**

Most students in the College of Arts and Letters or in the Mendoza College of Business may participate in the Environmental Sciences Program as second majors. Students who are considering the environmental sciences second major must have a first major in one of the departments of the College of Arts and Letters or the Mendoza College of Business. Because of the sizable overlap in requirements, students in the College of Arts and Letters who have a second major in preprofessional studies will not be allowed to add this second major program.

The requirements for second majors consist of the following science courses: 18

General Biology (BIOS 10171+11173 and BIOS 10172+11174)

General Ecology (BIOS 30312, 31312)

Chemistry (CHEM 10171, 10172) or (CHEM 10171, 10122)

Environmental Chemistry (CHEM 20204) or approved alternative

Geology (SC 20110 with lab)

Biostatistics (BIOS 40411)

Biology or Geology elective (3 or 4 credits) 12

**The total required course work requires a minimum total of 32 credits in science beyond the University math requirement.**

**Note, the same policy applies for Environmental Sciences first and second majors: All College of Science courses specified by the major program must be taken at the University of Notre Dame. (An exception is made for any science courses taken for this major through an approved Notre Dame study abroad program.)**

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To Table of Contents
disciplinary coursework in an area of major study so that students learn to integrate diverse ways of thinking and appreciate interdisciplinary problem-solving.

Students in the minor receive training in the principles and practices of sustainability through formal courses and independent study. Graduates of the minor will be equipped with knowledge and skills about sustainability, an ability to communicate about sustainability, and an imperative to implement sustainable practices. Graduates will be prepared to make substantive contributions to the development of more sustainable practices, practices that benefit their personal and professional lives, the lives of others, and the lives of future generations. Students will also be well positioned for in-depth study on sustainability at the post-baccalaureate level. Finally, the study of Catholic traditions and social and environmental ethics will help students understand the role that religious commitment can play in achieving sustainability.

Students can apply for admission to the minor in their first year, sophomore year, or junior year by contacting the director of the minor. They are required to take a gateway course “Sustainability: Principles and Practices”, an interdisciplinary course taught by faculty from multiple departments across the University. This course should be taken at or near the beginning of study in the minor, but students do not need to declare the minor to enroll.

Students then select from a list of approved courses totaling at least 4 classes of at least 10 credits. These courses fall into four categories (Design, Impacts, Social Institutions, and Individual Behavior and Values) and are tagged as such using the course attributes which are searchable via the University’s online Class Search. Students must take two courses outside of their College. They also must take courses from three out of the four elective categories. Several 1-credit courses are offered each year that can be used to fulfill the 10th elective credit. Students planning to study abroad are encouraged to petition for approval of relevant courses at their international institution before they leave campus.

Students must meet with the director of the minor in sustainability to discuss their capstone projects during the spring semester of their penultimate year, but they are encouraged to set up an initial meeting sooner. They are required to submit a brief description of their project proposal at the end of their penultimate year and identify a faculty member who has agreed to serve as their advisor. Students will receive feedback on their proposals from the Sustainability Minor Advisory Board and may be required to resubmit their proposals with modifications to gain approval. Students wishing to start their project earlier (for example, the summer before their junior year) should submit their project proposal before they begin their research. Students will enroll in one credit of independent study in the fall of their final year (SUS 48001), during which they will hand in a substantial portion of their project, and one credit of independent study in the spring (SUS 48002), during which they will complete their project. Students wishing to partner with another student for their capstone project or to combine their capstone with a thesis in their home department are encouraged to consult with the director of the minor.

Additional details about the Minor in Sustainability can be found online at [http://sustainabilitystudies.nd.edu](http://sustainabilitystudies.nd.edu).

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**Chemistry and Biochemistry**

**Chair:**
Brian M. Baker  
George and Winifred Clark Professor of Chemistry  
Christian Melander  
Emil T. Hofman Professor of Chemistry  
Bradley D. Smith  
Charles Huisking Professor of Chemistry  
Brian Blagg  
Kleiderer-Pezold Professor of Biochemistry  
Francis J. Castellino  
Kleiderer-Pezold Professor of Biochemistry  
Sharon Stack  
Navari Family Professor of Life Sciences  
Shahriar Mobashery  
Rev. John A. Zahn Professor:  
Brian M. Baker  
Rev. John Cardinal O'Hara Professor:  
Patricia L. Clark  
Arthur J. Schmidt Professor of Chemical and Biomolecular Engineering:  
Paul Bohn  
Rev. John A. Zahn Professor of Science:  
Prashant V. Kamat

**Professors:**
Seth Brown; Ian Carmichael; Steven A. Corcelli; Mary Galvin; J. Daniel Gezelter; Holly V. Goodson; Gregory V. Hartland; Paul Helquist; Paul W. Huber; Masaru Kenneth Kuno; A. Graham Lappin; Marya Lieberman; Anthony Serianni; Slavi Sevov; Richard E. Taylor; Olaf G. Wiest

**Associate Professors:**
Brandon L. Ashfield; Jon P. Camden; Haifeng Gao; Vlad M. Iluc; S. Alexander Kandel; Laurie E. Littlepage; Jeffrey W. Peng; Rebecca Whelan

**Assistant Professors:**
Jessica Brown; Armando Serrano; Emily Tsui; Katherine White

**Teaching Faculty:**
Rachel Branco; DeeAnne Goodenough-Lashua; Douglas Miller; Bahram Mousser; Jim Parise; Sarah West; Steven Wietstock; Kelley M.H. Young

**Emeriti:**
Subbhas C. Basu; Xavier Creary; Norman Dovichi; Thomas P. Fehlner; Richard W. Festenfeld; Dan Meisel; Thomas L. Nowak; W. Robert Scheidt; Anthony M. Trozzolo

**Program of Studies.** Chemistry is the science of substances that comprise the world about us and is concerned with their structure, their properties and the reactions that change them into other substances. Chemists and biochemists practice their profession in many ways—in educational institutions, government laboratories, private research institutions and foundations and in many commercial areas, including the chemical, drug, health, biotechnology, pharmaceutical and food industries.
The Department of Chemistry and Biochemistry has a strong undergraduate program together with a strong graduate education and research program. The graduate program greatly benefits undergraduate education by attracting highly qualified faculty and results in the availability of excellent research facilities and modern instrumentation necessary to train the scientists of tomorrow. This department is able to provide an excellent program of undergraduate research to complement regular course work. Student participation in research is highly encouraged as a key part of the education of chemistry and biochemistry majors.

The programs in chemistry and biochemistry described in the following pages prepare students for graduate studies and professional work in the chemical and biochemical sciences, as well as in interdisciplinary areas that rely heavily on chemistry. Bachelor of science degrees are offered with a major in biochemistry. At the graduate level, the Department of Chemistry and Biochemistry offers programs leading to the degrees of master of science and doctor of philosophy, as described in the Graduate School Bulletin of Information.

BACHELOR OF SCIENCE WITH A MAJOR IN CHEMISTRY

The chemistry curriculum at Notre Dame includes two programs: the Chemistry Career Program, designed for students interested in a professional career in chemistry, and the Chemistry Combination Program, designed for students interested in a professional career in chemistry, and the Chemistry Combination Program are from either the area of chemical and biochemical sciences, as well as in interdisciplinary areas that rely heavily on chemistry.

Bachelor of science degrees are offered with a major in biochemistry. At the graduate level, the Department of Chemistry and Biochemistry offers programs leading to the degrees of master of science and doctor of philosophy, as described in the Graduate School Bulletin of Information.

Combination Program
Program Electives (15 credit hours)
Science Electives (three credit hours) ²

The program electives for the Chemistry
Combination Program are from either the area of business or from the area of computing and are the same as those in the corresponding Colleague Sequence programs:

Chemistry with Business
Accounting I (BASC 20100)
Accounting II (ACCT 20200 or FIN 30210 or
FIN 30220 or FIN 30600 or MGT 40750)
Corporate Financial Management (BASC 20150)
Principles of Management (BASC 20200)
Principles of Marketing (BASC 20250)
Introduction to Economics (ECON 10010) or
Principles of Microeconomics (ECON 20010) is
suggested as a non-program elective, as a prerequisite
to BASC 20250 and meets the University social
science requirement.

Chemistry with Computing
Each student selects 15 credit hours of computer
science and engineering and chemistry courses in
consultation with a departmental advisor. Program
electives require careful scheduling.

Chemistry with Neuroscience
BIOS 10172/11174* Biology II: Molecules to
Ecosystems (w/lab)
NSBH 20450/21450 Neuroscience and Behavior
w/lab
NSBH 30301 Molecular Neuroscience
NSBH 30520 Introduction to Cognitive
Neuroscience
NSBH Elective I
NSBH Elective II

Biochemistry with Neuroscience
NSBH 20450/21450 Neuroscience and Behavior
w/lab
NSBH 30301 Molecular Neuroscience
NSBH 30520 Introduction to Cognitive
Neuroscience
NSBH Elective I
NSBH Elective II

*Although not required for chemistry, this biology
course is a prerequisite for the neuroscience courses.

Sample Curriculum (Career Program):
First Year
First Semester
CHEM 10181 4
CHEM 11181 4
MATH 10550 4
PHYS 10310 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Second Semester
CHEM 10182 4
CHEM 11182 0
MATH 10560 4
PHYS 10320 4
University Requirement 3
University Requirement 3
Moreau First Year Experience 1

Sophomore Year
First Semester
CHEM 20283 3
CHEM 21283 1
CHEM 23201
Language 3
University Requirement 3
Elective 4

Second Semester
CHEM 20284 3
CHEM 21284 1
CHEM 20262 3
Language 3
Electives 6

Junior Year
First Semester
CHEM 30321 3
CHEM 30333 3
CHEM 31333 1
CHEM 23203 1
Elective (or Language) 3
University Requirement 3

Second Semester
CHEM 30322 3
CHEM 31322 2
CHEM 40434 or CHEM 40436 3
University Requirement 3
Elective 3

Senior Year
First Semester
CHEM 40420 3
CHEM 40443 3
CHEM 41443 2
Electives 3
University Requirement 3

Second Semester
CHEM 23202 1
Science Electives ² 6
Electives 6

To Table of Contents
### Sample Curriculum (Combination Program):

#### First Year

**First Semester**
- CHEM 10181 4
- CHEM 11181 0
- MATH 10550 4
- PHYS 10310 4
- University Requirement 3
- University Requirement 3
- Moreau First Year Experience 1

**Second Semester**
- CHEM 10182 4
- CHEM 11182 0
- MATH 10560 4
- PHYS 10320 4
- University Requirement 3
- University Requirement 3
- Moreau First Year Experience 1

#### Sophomore Year

**First Semester**
- CHEM 20283 3
- CHEM 21283 1
- CHEM 23212 0
- CHEM 23201 1
- BIOS 30341 3
- Language 3
- University Requirement 3
- Elective 3

**Second Semester**
- CHEM 20284 3
- CHEM 21284 1
- CHEM 20262 3
- Language 3
- Elective 4

#### Junior Year

**First Semester**
- CHEM 30321 3
- CHEM 30333 3
- CHEM 31333 1
- Elective (or Language) 4
- Program Elective 3

**Second Semester**
- CHEM 23202 1
- CHEM 30322 3
- CHEM 31322 2
- CHEM 40434 3
- University Requirement 3
- Program Elective 3

**Senior Year**

**First Semester**
- CHEM 40420 3
- CHEM 40443 3
- Program Electives 6
- CHEM 41443 2

**Second Semester**
- CHEM 23202 1
- Science Elective 2
- Program Elective 3
- University Requirement 3
- University Requirement 3

**Notes:**
1. Substitution with permission only.
2. Undergraduate research, CHEM 48498, is a recommended science elective in all programs beginning in the sophomore year, with typically one or two credits per semester.
3. The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. Economics is required for the Chemistry with Business program.
4. One course in theology and philosophy should be completed by the end of the sophomore year. These courses may be taken in either semester of the first or second year.
5. In all the programs, one chemistry seminar is generally taken in each of the sophomore, junior and senior years.

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### Bachelor of Science with a Major in Biochemistry

The biochemistry curriculum emphasizes the chemical basis of biological processes. All biochemistry majors are required to take the following courses:

- General Chemistry
- Organic Chemistry
- Inorganic Chemistry
- Physical Chemistry
- Analytical Chemistry
- Chemistry Seminars
- Biochemistry Seminar
- Biochemistry
- Mathematics
- Physics
- Biology
- Genetics
- Cell Biology
- Molecular Biology

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### Sample Curriculum (Biochemistry Program):

#### First Year

**First Semester**
- CHEM 10181 4
- CHEM 11181 0
- MATH 10550 4
- BIOS 10171 3

**Second Semester**
- CHEM 10182 4
- CHEM 11182 0
- MATH 10560 4
- BIOS 11174 1

#### Sophomore Year

**First Semester**
- CHEM 20283 3
- CHEM 21283 1
- CHEM 20262 3
- Language 3
- University Requirement 3

**Second Semester**
- CHEM 20284 3
- CHEM 21284 1
- BIOS 20303 3
- Language 3

#### Junior Year

**First Semester**
- CHEM 30341 3
- CHEM 31341 2
- CHEM 23203 1
- PHYS 20210 4
- Elective (or Language) 3

**Second Semester**
- CHEM 30338 3
- CHEM 30342 3
- PHYS 20220 4
- University Requirement 3

**Senior Year**
- CHEM 40420 3
- CHEM 40443 3
- Program Electives 6
- CHEM 41443 2

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### Notes:
1. Substitution with permission only.
2. Undergraduate research, CHEM 48498, is a recommended science elective in all programs beginning in the sophomore year, with typically one or two credits per semester.
3. The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. Economics is required for the Chemistry with Business program.
4. One course in theology and philosophy should be completed by the end of the sophomore year. These courses may be taken in either semester of the first or second year.
5. In all the programs, one chemistry seminar is generally taken in each of the sophomore, junior and senior years.
Chemistry and Biochemistry

Senior Year
First Semester
CHEM 30333 2
CHEM 31333 2
BIOS/CHEM 50531 3
University Requirement 3
Elective 3
—— 13

Second Semester
CHEM 23202* 5 1
University Requirement 3
Electives 9
—— 13

Notes:
1. Substitution with permission only.
2. The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. Economics is required for the Chemistry with Business program.
3. One course in theology and philosophy should be completed by the end of the sophomore year. These courses may be taken in either semester of the first or second year.
4. Undergraduate research, CHEM 48498, is a recommended science elective in all programs beginning in the sophomore year with typically one or two credits per semester. BIOS 21303 and BIOS 31341 can also satisfy science electives.
5. In all the programs, one chemistry seminar is generally taken in each of the sophomore, junior and senior years.

Honors in Chemistry and Biochemistry
Junior majors in chemistry and biochemistry may apply for the departmental honors program to receive the designation “honors in chemistry” or “honors in biochemistry” in their student transcript if they have a minimum grade point average of 3.5 and are enrolled in undergraduate research CHEM 48498 or CHEM 48499. The requirements for completion of the honors program are a minimum of two semesters of undergraduate research after the beginning of the junior year and the course CHEM 48500, with a grade of B or better. CHEM 48500 has to be taken in the semester the thesis is presented.

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Chemistry and Biochemistry. Course descriptions can be found by clicking on the subject code and course number in the search results.

Graduate courses in chemistry are open to qualified advanced undergraduate students, subject to the approval of the departmental advisor. These courses are listed in the Graduate School Bulletin of Information.

SUMMARY OF MINIMAL REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY AND BIOCHEMISTRY

<table>
<thead>
<tr>
<th></th>
<th>Chemistry Career Program</th>
<th>Chemistry Combination Program</th>
<th>Biochemistry Program</th>
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<td>Physics</td>
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<td>3</td>
</tr>
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<td>Philosophy+</td>
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<td>6</td>
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<tr>
<td>Theology+</td>
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</tr>
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<td>University Requirement</td>
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<tr>
<td>University Requirement</td>
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<tr>
<td>Free Electives</td>
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<td>8++</td>
<td>15++</td>
</tr>
<tr>
<td></td>
<td>**124</td>
<td>**124</td>
<td>**124</td>
</tr>
</tbody>
</table>

* One of these courses must be a University Seminar.
++ Assumes intermediate-level competency in language was achieved by taking two 4-credit introductory-level and one 3-credit intermediate-level course.
Mathematics

Chair: Richard Hind
Associate Chair: Matthew J. Dyer
Director of Graduate Studies: Samuel R. Evens
Director of Undergraduate Studies: Sonja Mapes-Székelyhidi
William J. Hank Family Professor of Mathematics: Anand Pillay
Charles L. Huisking Professor of Mathematics: Julia F. Knight
John and Margaret McAndrews Professor of Mathematics: Arthur Lim; Annette Pilkington
Charles L. Huisking Professor of Topology: Andrew Putman

Professors:
Peter A. Cholak; Francis X. Connolly (emeritus); Jeffrey A. Diller; William G. Dwyer (emeritus); Matthew J. Dyer; Samuel R. Evens; Leonid Faybusovich; David Galvin; Michael Gekhtman; Karsten Grove (emeritus); Matthew Gursky; Alexander J. Hahn (emeritus); Brian C. Hall; Qing Han; Alex A. Himonas; Richard Hind; Alan Howard (emeritus); Francois Ledrappier (emeritus); Juan Migliore; Gerard K. Misiolek; Liviu Nicolaescu; Barth Pollak (emeritus); Mei-Chi Shaw ; Roxanne Smarandache; Brian Smyth (emeritus); Dennis M. Snow; Nancy K. Stanton (emeritus); Sergei Starchenko; Laurence R. Taylor; Warren J. Wong (emeritus); Frederico Xavier (emeritus)

Associate Professors:
Kathina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Claudiu Raicu

Assistant Professors:
Nicholas Edelen; Felix Janda; Alexandra Kjuchukova; Pavel Mnev; Juanita Pinzon Calcedo; Marco Radeschi; Christopher Schommer-Pries; Alexander Shapiro

Special Professional Faculty:
Arthur Lim; Annette Pilkington

Associate Special Professional Faculty:
Andrew Jorza; Sonja Mapes-Székelyhidi

Program of Studies. Mathematics has had a profound effect upon civilization since ancient times, when the legend originally inscribed on the entrance to Plato's academy was "Let no one ignorant of geometry enter here." It was equally true during the medieval period, when arithmetic and geometry constituted two of the seven subjects considered essential for a liberal education. It has been said that the second most influential book in the span of Western civilization—after the Bible—is Euclid's Elements. Although mathematics is usually associated with science and technology in the modern mind, it seems apparent from the writings of the great mathematicians of the 17th and 18th centuries that religious belief played a great role in their pursuit of mathematics. They saw the "system of the world" obeying mathematical laws and as a consequence felt impelled to study mathematics so as to better appreciate the world's Creator.

Mathematics continues to have a profound influence in our century. From the theory of relativity, with its applications to the study of the large-scale structure of the universe, to the development of the modern computer, with its manifold applications in science, technology and business, mathematics has played a fundamental role. It is surely the most universal of all scientific tools, and the student equipped with a strong mathematical background will be in the enviable position of being able to employ his or her expertise in any area in which rigorous thought and precision of results are mandated.

The department is dedicated to the development of undergraduate studies, to the teaching of mathematics to scientists, engineers and teachers, to graduate education and research, and to the discovery of new mathematics. The entire faculty is involved with undergraduate affairs, and students have the opportunity of associating with scholars of international repute. Mathematics at Notre Dame provides students with a discipline of the mind and a stimulation of the imagination par excellence.

Programs in mathematics prepare students for graduate studies or for professional work in fields in which mathematics plays a dominant role. They provide an excellent preparation for law school, medical school, business school and secondary school teaching. Graduates may enter careers in research institutes or industrial or government positions.

In addition to its undergraduate programs, the department offers programs of graduate study leading to the degree of doctor of philosophy, as described in the Graduate School Bulletin of Information.

The department recognizes that, besides those students who wish to pursue a career devoted primarily to mathematical research and teaching, many will wish to take positions in business, industry or government where they will be using their mathematical skills in close collaboration with engineers as well as biological, physical and social scientists. These students will find among the listed programs one well suited to their needs. Besides these programs a student may, in consultation with the director of undergraduate studies and the department chair, create a program especially tailored to his or her career goals.

BACHELOR OF SCIENCE WITH A MAJOR IN MATHEMATICS

The mathematics curriculum at Notre Dame includes seven course sequences or areas of concentration within the College of Science. These programs are designed to accommodate the academic and professional interests of all mathematics majors. Brief descriptions are given below, and more detailed descriptions of these programs are available on request from the Department of Mathematics.

College Requirements. All must take the following College of Science courses: (CHEM 10171, 10172) or (CHEM 10171, 10122); PHYS (10310 or 10093) and PHYS (10320 or 10094); and an additional science elective.

A student who takes two semesters of organic chemistry or two semesters of general biology is only required to take PHYS (30210 or 10095) and (30220 or 10096).

Mathematics Honors Program
This program is suited to students who are interested in graduate work in one of the mathematical sciences and to those whose career plans require a strong background in modern mathematics.

Honors Calculus I (MATH 10850)
Honors Calculus II (MATH 10860)
Honors Calculus III (MATH 20850)
Honors Calculus IV (MATH 20860)
Honors Algebra I (MATH 20810)
Honors Algebra II (MATH 20820)
Honors Algebra III (MATH 30810)
Honors Algebra IV (MATH 30820)
Honors Analysis I (MATH 30850)
Honors Analysis II (MATH 30860)

Electives (12 credit hours with six at the 40000 level)

Mathematics Courses for the Other Programs
All other mathematics programs (except the computing program) require the following mathematics core courses:

Calculus I (MATH 10550)
Calculus II (MATH 10560)
Calculus III (MATH 20550)
Ordinary Differential Equations (MATH 20750)
Linear Algebra (MATH 20610)
Introduction to Math Reasoning (MATH 20630)
Algebra (MATH 30710)
Real Analysis (MATH 30750)

In addition to this basic sequence, the following courses are required for each program:

Mathematics Career Program
This program is designed to give students a general background in mathematics. In addition to the basic sequence of courses listed above, 15 hours of mathematics electives are required, at least three of which are at the 40000 level.

Mathematics and Life Sciences Program
This program is designed for mathematics majors who are interested in life-science-oriented careers.
Mathematics and Business Administration

The following mathematics courses are required in addition to the basic sequence of courses listed above:

- Introduction to Probability (MATH 30530)
- Mathematical Statistics (ACMS 30540)
- Elective in Mathematics (three credit hours at the 40000 level)

The following College of Science courses are required:

- Chemistry (CHEM 10171, 10172, 20273, 20274)
- Biology I and II (BIOS 10171–10172)
- Genetics (BIOS 20303, 21303)

Mathematics and Computing Program

This program is designed for students who plan to pursue graduate study or industrial careers in computing science. All of the mathematics core courses listed above are required, as well as 15 hours of mathematics electives, at least three hours of which are at the 40000 level.

In addition, the student must complete one of the following sequences of computing courses:

- Software design option: CSE 20311, CSE 20312, CSE 20110, CSE 30331, CSE 30246, fourth elective
- Theory option: CSE 20311, CSE 20312, CSE 20110, CSE 30331, CSE 30151, CSE 40113
- Theory and compilers option: CSE 20311, CSE 20312, CSE 20110, CSE 30331, CSE 30151, CSE 40243
- Computer architecture option: CSE 20311, CSE 20312, CSE 20221, CSE 30321, CSE 40322, fourth elective

Mathematics Education Program

This program is designed for students who plan a career in secondary education. The following mathematics courses are required in addition to the basic sequence listed above:

- Introduction to Probability (MATH 30530)
- Mathematical Statistics (ACMS 30540)
- Geometry (MATH 361 at Saint Mary's College, 3 credit hours)
- Discrete Math (MATH 30210, 40210 or 40220, 3 credit hours)
- One Mathematics elective (3 credit hours)

(One of these classes must be at the 40000 level)

The following education courses are to be taken at Saint Mary's College: EDUC 201, 220, 340, 345, 346, 356, 451, and 475.

Mathematics and Business Administration Program

This program is designed to prepare students for a career in business or in the actuarial profession. The following mathematics courses are required in addition to the basic sequence:

- Introduction to Probability (MATH 30530)
- Mathematical Statistics (ACMS 30540)
- Introduction to Operations Research (MATH 30210)

Two electives in Mathematics (including three credits at the 40000 level)

Also required are ECON 20010 or its equivalent and the following courses from the College of Business: BASC 20100, BASC 20150, BASC 20200, BASC 20250 and one course from the following list: ACCT 20200, FIN 30210, FIN 30220, FIN 30220, FIN 30600.

Mathematics and Engineering Science Program

This program is designed for students interested in applied or industrial mathematics. In addition to the mathematics core courses, the student is required to take one of MATH 40480, MATH 40590 or MATH 40750, and 12 more credits of mathematics electives. The student must also complete one of the following two sequences of engineering classes:

- Thermal option: AME 20221, AME 20222, AME 30331, AME 20231, AME 30334
- Structures and design option: AME 20221, AME 20241, AME 20231, CE 30200, CE 30210

Mathematics as a Second Major

Students in the Mendoza College of Business or the College of Arts and Letters may pursue a second major in mathematics by completing all mathematics courses required for the career mathematics concentration. See the list below. To list mathematics as a second major on the transcript, the student must satisfy all of the requirements for a major in some department of the Mendoza College of Business or the College of Arts and Letters.

- MATH 10550–10560–20550. Calculus I-III
- MATH 20550. Calculus III
- MATH 30750. Ordinary Differential Equations
- MATH 20750. Ordinary Differential Equations
- MATH 20630. Introduction to Abstract Math
- MATH 30710. Algebra
- MATH 30750. Real Analysis
- Mathematics Electives

Students must take 24 unique credits of mathematics courses in addition to what is required for their engineering major and that their math requirements for both their engineering major as well as their math supplemental major will come from the honors sequences. Specifically, that students will take MATH 10850–10860; MATH 20850–20860; MATH 20810–20820; MATH 30810–30820; and MATH 30850–30860 in place of courses such as MATH 10550, 10560, 20550, and 20580.

Sample Curriculum (Mathematics Career Program):

**First Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Second Semester</th>
<th>Sophomore Year</th>
<th>Junior Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 10550. Calculus I</td>
<td>4</td>
<td>MATH 10560. Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 10171. Chemical Principles</td>
<td>4</td>
<td>PHYS 10310. Engineering Physics I</td>
<td>4</td>
</tr>
<tr>
<td>University Requirement</td>
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<td>University Requirement</td>
<td>3</td>
</tr>
<tr>
<td>University Requirement</td>
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</tr>
<tr>
<td>19</td>
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</tr>
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</table>

**Supplemental Major in Mathematics for Engineering**

Students in the College of Engineering may pursue a supplemental major in mathematics by completing all of the mathematics courses required for the career mathematics concentration in addition to completing the mathematics requirements for the engineering degree. In practice this means that students must take 24 unique credits of mathematics courses in addition to what is required for their engineering major and that this list must include MATH 20630, MATH 30710, and MATH 30750.

**Supplemental Major in Honors Mathematics for Engineering**

Students in the College of Engineering may pursue a supplemental major in honors mathematics by completing all of the mathematics courses required for the career mathematics concentration in addition to completing the mathematics requirements for the engineering degree. In practice this means that students must take 24 unique credits of mathematics courses in addition to what is required for their engineering major and that their math requirements for both their engineering major as well as their math supplemental major will come from the honors sequences. Specifically, that students will take MATH 10850–10860; MATH 20850–20860; MATH 20810–20820; MATH 30810–30820; and MATH 30850–30860 in place of courses such as MATH 10550, 10560, 20550, and 20580.
MINOR IN ACTUARIAL SCIENCE

The Department of Mathematics offers actuarial science as an academic minor. There is a heavy demand for the business courses which are required for this minor, and students are not guaranteed registration availability for these courses. Please see the academic advisor for more information. The actuarial science minor requires completion of the following ten courses:

- MATH 30530. Probability 3
- ACMS 30540. Statistics 3
- MATH 30610. Introduction to Financial Mathematics 3
- One mathematics elective at the 30000-level or above 3
- BASC 20100 or ACCT 20100. Accountancy I 3
- BASC 20150 or FIN 20150. Corporate Financial Management 3
- FIN 30220. Macroeconomic Analysis 3
- ECON 10010. Principles of Microeconomics 3
- Actuarial Elective 3

Total: 27

Among the ten courses required for the minor, up to five courses can be double-counted for the student's major.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject Mathematics. Course descriptions can be found by clicking on the subject code and course number in the search results.

Certain graduate courses in mathematics are open to qualified advanced undergraduates, subject to the approval of the director of undergraduate studies. Other graduate courses are described in the Graduate School Bulletin of Information.

Neuroscience and Behavior

Director of Undergraduate Studies:
Nancy Michael

Program in Neuroscience and Behavior.
Neuroscience is a relatively young, exciting, and fundamentally interdisciplinary field devoted to the scientific study of the nervous system. Neuroscience encompasses the study of problems from multiple disciplinary perspectives at different levels of analysis in human and non-human organisms. It includes, for example, the study of molecular mechanisms in individual neurons and the coordination of millions of neurons into neural systems. Problems range from investigation of the evolution of nervous systems in basal vertebrates to the application of neuroscience to education and law. Neuroscientists also seek to develop neurologically plausible models of human thinking, affect and behavior.

At the University of Notre Dame, the neuroscience and behavior major is an interdisciplinary program that includes both Bachelor of Science and Bachelor of Arts tracks. This description covers the BS track only (see the Arts & Letters section for description of the BA track). The requirements for the major are essentially the same, including three foundational neuroscience and behavior Core courses, and an introductory neuroscience and behavior laboratory course beginning the fall of the sophomore year. The tracks differ in how they fulfill college requirements. Required courses and electives for both the BS & BA that will satisfy the major credit requirements are drawn primarily from the Departments of Biological Sciences and Psychology. Undergraduate research and approved electives in other departments are also encouraged.

Research within the neuroscience and behavior program is reflective of the diversity of the field, with faculty pursuing research spanning from cellular and molecular approaches to architectural design and policy. Faculty are not housed within a specific department, but are affiliated based off their research interests; the unifying theme across disciplines is the understanding of the brain and behavior.

Students choosing an undergraduate major in neuroscience and behavior are well prepared for admissions to medical school, physical therapy or other professional schools, or to continue on for graduate study (e.g., Ph.D., M.D./Ph.D., M.S., MPH). Graduates who wish to enter the work force directly from their undergraduate studies are desirable candidates in careers ranging from industry, biotechnology, biotechnology sales, health-related research, health-related consulting, government, education, or policy.

This major requires a minimum of 61 credits in the College of Science. Students should discuss their specific choices with the program’s undergraduate adviser.
BACHELOR OF SCIENCE WITH A MAJOR IN NEUROSCIENCE AND BEHAVIOR

All neuroscience and behavior majors (BS track) take the following courses in science:

Mathematics (MATH 10350 or 10550 or 10850) and (MATH 10360 or 10560 or 10860)
General Chemistry (CHEM 10171/11171 or 10181/11181)
Organic Chemistry (CHEM 10172/11172 or 10182/11182) and (CHEM 20273/21273 or 20283/21283)
Physics (PHYS 10310/11310 or 20210/21210 or 10411/11411) and (PHYS 10320/11320 or 20435/21435 or 20220/21220)
Bios: Big Questions w/lab—BIOS 10171/11173
Biology II: Molecules to Ecosystems & lab (BISO 10172/11174)
Intro to Cognitive Neuroscience (NSBH/PSY 30520)
Molecular Neuroscience (NSBH/CHEM 30301)
Perspectives on the NSBH major (NSBH 20010)
One additional lab in Biological Sciences (genetics, cell bio, physiology accepted; others with prior approval)

All majors to choose an additional 2 courses from the foundational science elective choices below:

Genetics—BIOS 20250/21250 (taken together) or 20303
Cell Biology—BIOS 20241 or 30341
Biochemistry—CHEM 40420
Scientific computing—ACMS 20210
Intro Appl Math Methods I—ACMS 20550
Intro Dynamical Syst for Sci—MATH 20480
Intro to Math Reasoning—MATH 20630
Exp Psych I: Research Methods—PSY 30160

All neuroscience and behavior majors take the following courses in Psychology:

Intro to Psychology PSY 10000 or 20000

In addition all neuroscience and behavior majors take at least one course in statistics:

BIOS 40411 or PSY 30100

All majors to take an additional 6 credits from the list of approved Biological Science electives, 6 more credits from the list of approved Psychological Science electives and an additional 12 credits of approved NSBH coursework that can include a maximum of 6 credits of undergraduate research (with approved faculty advisors), 3 credits of neuroscience embedded community-based or service learning, and/or approved electives across several departments. See the undergraduate advisor for lists of approved courses and approved research advisors.

The major allows significant flexibility, directed by interests and career goals. The following is one curricular example of many, and students are urged to discuss their personal plans with the undergraduate advisor. The acronym “NSBH” refers to neuroscience and behavior elective choices pre-approved for the major.

COURSE DESCRIPTIONS

For a list of approved courses, contact the Director of Undergraduate Studies in the College of Science for this program Nancy Michael, (nmichael@nd.edu), or Anré Venter (aventer@nd.edu) the Director of Undergraduate Studies in the College of Arts & Letters. All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and searching within the home department of the course listing. Biological, psychological and additional courses for a given semester may be found within class search by selecting all subjects (CTRL/Shift) and selecting the NSBH attribute. Course descriptions can be found by clicking on the subject code and course number in the search results.

To Table of Contents

<table>
<thead>
<tr>
<th>NSBH B.S. SAMPLE CURRICULUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumes NO language placement or AP credit</td>
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<table>
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<th>FALL</th>
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<td><strong>First Year:</strong></td>
<td><strong>Second Year:</strong></td>
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<td>BIOS I: Big Questions 10170/11173</td>
<td>BIOS II: Molecules to Ecosystems 10172/11174</td>
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<td>CHEM 10171/11171 (Univ Core 2)</td>
<td>CHEM 10172/11172 (Univ Core 3)</td>
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<td>NSBH Core 2: Intro to Cog Neuro</td>
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<td>CHEM 20273 and 21273</td>
<td>NSBH Core 3: Molecular Neuro</td>
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<td>Intro Psych (Univ Core 5)</td>
<td>Statistics (BIOS 40411 or PSY 30100)</td>
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<td>Foundational Science elective (2)</td>
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Physics

Chair:
Peter M. Garnavich

Director of Graduate Studies:
Mark A. Caprio

Director of Undergraduate Studies:
Philippe Collon

Frank M. Freimann Professor of Physics:
Michael C.F. Wiescher

Aurora and Tom Marquez Professor of Physics:
Jacek K. Furdyna

Frank M. Freimann Professor of Physics:
Ani Aprahamian

Glynns Family Honors Collegiate Professor of Physics:
Christopher F. Kolda

Grace-Rupley Professor of Physics:
Timothy C. Beers

Frank M. Freimann Assistant Professor of Physics:
Badih Assaf

Rev. John Cardinal O’Hara, C.S.C., Professor of Physics:
Margaret Dobrowolska-Furdyna

Orentzo Family Associate Professor in Applied Medical and Nuclear Physics:
Maxime Brodeur

Tom and Carolyn Marquez Assistant Professor of Physics:
Yuhbin Tsai

Professors:
Dinesh Balsara; Daniel Bardayan; Philippe Collon; Antonio Delgado; Morten Eskildsen; Stefan G. Frauendorf; Umesh Garg; Peter M. Garnavich; Michael D. Hildreth; J. Christopher Howk; Boldizsar Jankó; Colin Jessop; Masaru Kuno (concurrent); Kevin P. Lannon; Craig S. Lent (concurrent); John M. LoSecco; Grant Mathews; Graham F. Peaslee; Terrence W. Rettig; Randal C. Ruchti; Jonathan R. Sapirstein; Rebecca Surman; Zoltán Toroczkai; Mitchell R. Wayne

Associate Professors:
Deriv Can Vural; Mark A. Caprio; Manoel Couder; Justin Crepp; Adam Martin; Jeffrey Peng (concurrent); Sylwia Ptasinska; Anna Simon

Assistant Professors:
Tan Ahn; Badih Assaf; Jeffrey Chilcote; Yi-Ting Hsu

Assistant Teaching Professors:
Abigail Mechenten; Will Zech

Emeriti:
Gerald B. Arnold; H. Gordon Berry; Ikaros I. Bigi; Howard A. Blackstead; Bruce A. Bunker; Neal M. Cason; Anthony K. Hyder; Walter R. Johnson; Gerald L. Jones; James J. Kolata; A. Eugene Livingston; William D. McGlinn; Kathleen E. Newman; John A. Poirier; Steven T. Ruggiero; Paul E. Shanley; Carol E. Tanner; Walter J. Tomash

Program of Studies. Physics is the study and description of the structure and behavior of the physical universe. As such, it is fundamental to all physical sciences, pure and applied. A knowledge of physics is basic to an understanding of astronomy, chemistry, geology and even biology in that physics contributes to the interpretation and detailed description of many of the natural phenomena which constitute the proper subjects of investigation in these sciences.

In addition to the undergraduate curricula, the Department of Physics offers programs for graduate study leading to the degrees of master of science and doctor of philosophy, as described in the Graduate School Bulletin of Information.

BACHELOR OF SCIENCE WITH A MAJOR IN PHYSICS

Science undergraduates may choose from two different majors within the Department of Physics: physics, and physics-in-medicine. The course sequences in these two programs are designed to accommodate the academic and professional interests of the majority of physics majors.

The basic physics major is a particularly flexible option for students, and is the one that will be chosen by the majority of undergraduates majoring in the department. Students following the physics major program will gain a broad understanding of physics. Depth is gained through the addition of one or more supplemental concentration programs offered through the department. Two of these concentration programs, advanced physics and astrophysics, help to prepare the student for graduate work in physics and astronomy or astrophysics.

Physics majors may add as many of the following concentrations as their interests and schedules allow. Completion of these concentrations is indicated on the student’s final transcript.

Concentration in Advanced Physics
The following outlines the course requirements (totaling 14 credits) for the advanced physics concentration:

Junior Seminar (PHYS 33411)
Electromagnetic Waves (PHYS 30472)
Quantum Mechanics II (PHYS 40544)
Senior Seminar (PHYS 43411)
Modern Physics I Laboratory (PHYS 40441)
Thermal Physics (PHYS 30461)
Quantum Mechanics I (PHYS 40453)

Concentration in Astrophysics
The following outlines the course requirements (totaling 14 credits) for the astrophysics concentration:

Junior Seminar (PHYS 33411)
Intro. Astronomy and Astrophysics M (PHYS 20481)
Modern Observational Techniques (PHYS 50481)
Senior Seminar (PHYS 43411)
Physics of Astrophysics (PHYS 50201)
Relativity: Special and General (PHYS 50472)

Concentration in Applied Physics
The requirements for the physics major are designed to accommodate the special interests of students intending careers in medicine, medical technology, or biophysics.

Requirements for the Physics Major
A total of 60 credits in science and mathematics is required for the physics major. The following outlines the course requirements:
**Requirements for the Physics-in-Medicine Major**

A total of 77 credits in science and mathematics is required for the physics-in-medicine major. The following outlines the course requirements:

**Physics A: Mechanics (PHYS 10411)**

**Physics B: E&M (PHYS 10422)**

**Physics C: Thermo & Relativity (PHYS 20433)**

**Physics D: Modern (PHYS 20444)**

**Intro to Circuitry and Electronics (PHYS 20430)**

**General Chemistry I–IV (CHEM 10171, 11171, 10172, 11172, 20273, 20274, 21273, 21274)**

**Calculus I, II, III (MATH 10550, 10560, 20550)**

**Sophomore Seminar (PHYS 23411)**

**Mathematical Methods in Physics I, II (PHYS 20451, 20452)**

**Intermediate Mechanics (PHYS 20454)**

**Electricity and Magnetism (PHYS 30471)**

**Quantum Mechanics I (PHYS 40453)**

**Biology I, II (BIOS 10171, 11173, 10172, 11174)**

**Three specialized science electives (9 credits total)**

**Requirements for Physics as a Second Major**

The requirements for physics as a second major, for students in the colleges of engineering, arts and letters or business, consists of the physics and mathematics courses listed above for the physics major, except the chemistry sequence. To list physics as a second major on the transcript, the student must satisfy all of the requirements for a major in some department and college of the university.

**Sample Curricula**

**MAJOR: PHYSICS**

**First Year**

**First Semester**

- MATH 10550, 12550
- PHYS 10411, 11411
- CHEM 10171, 11171
- University Requirements
- Moreau First Year Experience

**Second Semester**

- MATH 10422, 11422
- PHYS 10422, 11422
- University Seminar
- University Requirement
- Moreau First Year Experience

**Sophomore Year**

**First Semester**

- MATH 20550, 22550
- PHYS 20433
- PHYS 20430
- PHYS 20451, 22451
- PHYS 23411
- Language

**Second Semester**

- MATH 20430
- PHYS 20452, 22452
- Language
- University Requirement

**Junior Year**

**First Semester**

- PHYS 30461
- PHYS 30471
- PHYS 20430
- Language
- Elective

**Second Semester**

- PHYS 20454
- PHYS 40444
- PHYS 20452
- Language
- Electives

**Senior Year**

**First Semester**

- Modern Physics Electives
- PHYS 50501
- PHYS 40441, 41441
- Elective

**Second Semester**

- Modern Physics Electives
- PHYS 50502, 50701
- Elective

**MAJOR: PHYSICS CONCENTRATION: ASTROPHYSICS**

**First Year**

**Sophomore Year**

**First Semester**

- MATH 20550, 22550
- PHYS 20433
- PHYS 20451, 22451
- PHYS 23411
- Language

**Second Semester**

- University Requirement
- Electives

**Junior Year**

**First Semester**

- Modern Physics Electives
- PHYS 50501
- PHYS 40441, 41441
- Language

**Second Semester**

- Modern Physics Electives
- PHYS 50502, 50701
- Electives

**Senior Year**

**First Semester**

- Modern Physics Electives
- PHYS 50501
- PHYS 40441, 41441
- Elective

**Second Semester**

- Modern Physics Electives
- PHYS 50502, 50701
- Elective

**MAJOR: PHYSICS CONCENTRATION: ADVANCED PHYSICS**

**First Year**

**Sophomore Year**

**First Semester**

- PHYS 30461
- PHYS 30471
- PHYS 30481 or PHYS 50201
- Language

**Second Semester**

- Modern Physics Electives
- PHYS 50602, 50701
- Elective

**Junior Year**

**First Semester**

- Modern Physics Electives
- PHYS 50501
- PHYS 40441, 41441
- Language

**Second Semester**

- Modern Physics Electives
- PHYS 50502, 50701
- Electives

**Senior Year**

**First Semester**

- Modern Physics Electives
- PHYS 50501
- PHYS 40441, 41441
- University Requirement

**Second Semester**

- Modern Physics Electives
- PHYS 50502, 50701
- University Requirement
Second Semester
Modern Physics Electives\textsuperscript{\textsuperscript{28}}
PHYS 50602, 50701
3
PHYS 50472
3
Electives
6
University Requirement
3
\hline
15

\section*{MAJOR: PHYSICS-IN-MEDICINE}

\section*{First Year}

\textbf{First Semester}
MATH 10550, 12550\textsuperscript{10}
4
PHYS 10411, 11411
4
CHEM 10171, 11171
4
University Requirement
6
Moreau First Year Experience
1
\hline
19

\textbf{Second Semester}
MATH 10560, 12560
4
PHYS 10422, 11422
4
CHEM 10172, 11172
4
University Seminar
3
University Requirement
3
Moreau First Year Experience
1
\hline
19

\section*{Sophomore Year}

\textbf{First Semester}
BIOS 10171, 11174, 11173
4
MATH 20550, 22550
3.5
PHYS 20433
3
PHYS 20430
1.5
PHYS 23411
1
CHEM 20273, 21273
4
\hline
17

\textbf{Second Semester}
BIOS 10172, 11174
4
PHYS 20444
3
CHEM 20274, 21274
4
University Requirement
3
Language\textsuperscript{9}
4
\hline
18

\section*{Junior Year}

\textbf{First Semester}
BIOS 20303 \textsuperscript{4}
3
BIOS 30344 \textsuperscript{4}
3
PHYS 20451, 22451
3.5
Language\textsuperscript{9}
4
University Requirement
3
\hline
16.5

\textbf{Second Semester}
BIOS 30341 \textsuperscript{6}
3
PHYS 20454
3
PHYS 20452, 22452
3.5
University Requirement
3
Language\textsuperscript{9}
3
\hline
15.5

\section*{Senior Year}

\textbf{First Semester}
PHYS 40453
3
PHYS 30471
3
University Requirement
3
Electives
6
\hline
15

\textbf{Second Semester}
University Requirement
3
PHYS 50401\textsuperscript{7}
3
Electives
9
\hline
15

\section*{Notes}
1. Alternatively, PHYS 10310 and its laboratory and tutorial.
2. Alternatively, PHYS 10320 and its laboratory and tutorial.
3. Alternatives for CHEM 10171 and 10122 include CHEM 10171–10172 or CHEM 10181–10182 plus the associated laboratories and tutorials.
4. Honors Calculus I through III (MATH 10850, 10860, and 20850) may substitute for Calculus I to III.
5. Options include a 40000-level or above physics course, PHYS 48480 (Undergraduate Research: The student must take at least 3 credits in research with one advisor and the credits must be distributed over at least two semesters), or MATH 40480 (Complex Variables). Additional options are possible with approval of the Director of Undergraduate Studies. Physics electives cannot be double counted with requirements for the Astrophysics concentration.
6. Students take three from the following:
CHEM 40420 (Principles of Biochemistry),
BIOS 20303 (Fundamentals of Genetics),
BIOS 30344 (Vertebrate Physiology),
PHYS 30341 (Cellular Biology),
PHYS 50401 (Physics of Cells).
7. Alternatives for CHEM 10171–10172 include CHEM 10171–10172 or CHEM 10181–10182 plus the associated laboratories and tutorials.
8. PHYS 50481 (Modern Observational Techniques) is offered in the fall of odd years.
9. Assumes no AP credit or advanced placement.
10. One of these courses, minimum, must be taken (Fall or Spring).

\section*{COURSE DESCRIPTIONS}

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Physics. Course descriptions can be found by clicking on the subject code and course number in the search results.

\section*{HONORS TRACK IN PHYSICS}

The goal of this honors track is to give our most talented students an exceptional background in physics research. This track is open for both Physics majors and Physics in Medicine.

The track will accept physics majors in good academic standing as early as the spring of their sophomore year, who have identified their research advisor in the Physics Department and have already completed one semester of undergraduate research. Acceptance will be based on a research statement and transcript. At acceptance into the track a formal agreement will be set up between the student and the advisor.

To graduate with this honor, students will have to complete:
1. Typically at least three semesters and one summer of independent research either at Notre Dame or another university or research laboratory. Alternate research/internship venues and opportunities must be approved in advance by the DUS or Department Chair. Students are expected to apply for REU, COS-SURF or other summer funding as appropriate.
2. A substantial thesis that needs to be approved by the advisor (a manuscript submitted for publication can substitute only if the student has made substantial contributions to the work).
3. A presentation at a national or regional meeting, or at the Notre Dame COS-JAM conference.
4. Successful completion of all requirements for one of the physics concentrations, or completion of the physics in medicine degree.
5. A GPA of at least 3.33 in College of Science courses.

\section*{Thesis Requirements:}

The final draft of the thesis will be written under the supervision of the advisor, and will be submitted by April I. Each thesis will be reviewed by one member of the Undergraduate Research Committee. If the thesis is not approved, a second committee member will read the thesis and confer. The students will be notified by April 15 if a rewrite is needed. The rewrite will be due May 1.

The thesis is intended to support and develop each student's independence, scientific communication skills, critical review skills, and understanding of their research in the context of the larger field. It will have the added benefit of helping students prepare for graduate applications and fellowships.

The student's transcript will carry the notation “Honors Physics” to distinguish it from the Glynn Family Honors Program. If the student is also in the Glynn Family Honors program, the thesis presented in that program could be considered for the Honors Track in Physics, but would need approval by the Physics Undergraduate Research Committee.
Preprofessional Studies

Chair, Assistant Dean and Faculty:
Rev. James K. Foster, C.S.C., M.D.
Associate Dean for Collegiate Sequence & Study Abroad:
Sr. Kathleen Cannon, O.P.
Assistant Dean, Advisor and Faculty:
Kathleen J.S. Kolberg, Ph.D.
Advisor and Faculty:
Susan Gursky Ph.D.
Hillebrand Center Director and Faculty:
Dominic Vachon, Ph.D.

Adjacent Professors:
Mark Fox, M.D.; Gary B. Fromm, M.D.; Robert D. White, M.D.; Brandon Zabukovic, M.D.

Program of Studies. The Department of Preprofessional Studies offers several programs in the two major sequences, namely the program sequence in science preprofessional studies (SCPP) and the program in the collegiate sequence (SCBU, SCCO, SCED).

SCIENCE PREPROFESSIONAL PROGRAM (SCPP)

Healthcare in the United States has been undergoing a sea change including health systems, best clinical practices, and training, extending even into the pre-professional undergraduate years. There is an emphasis on broader and deeper education and interest in professionals on the healthcare team beyond the physician is expanding rapidly. This major is designed to allow those seeking to enter any of the health professions to customize their undergraduate education to fulfill the prerequisites for a variety of health professions schools. The biggest change has come from medical admissions with a new 7.5 hour MCAT exam and a changing emphasis on competencies rather than a checklist of prerequisites. There is an emphasis on a depth of science competency (e.g. biochemistry, research methods, and statistics) and an added emphasis on the psychosocial aspects of care.

With the new holistic model of pre-medical education, this major offers flexibility to study across science departments and space in the schedule to add depth in the humanities or social science by adding a second major or minor. This department also provides general elective courses, open to all majors, that address clinical practice and medical systems (See the following section on the Hillebrand Center).

There are 24 credit hours of science elective courses required beyond the core sciences. These include most upper level science courses taught across the traditional science departments (biological sciences, chemistry, physics and mathematics). The classes are taken during the school year and only occasionally, with consultation with your advisor, should students take any of the major courses in the summer. The Notre Dame College of Science does not allow transfer of science courses with the exception of preapproved courses through Notre Dame International Programs. Those students who wish to matriculate directly to medical school after graduation should plan to take cell biology, statistics and biochemistry by the end of junior year in order to take the MCAT at the end of that year. Students planning to attend PA or PT programs should plan physiology and anatomy during the junior year. Student involvement in research is encouraged and up to 2 credit hours per semester for 3 semesters taken in one of the traditional science departments can count toward the 24 science elective credits (total of 6 maximum).

Non-science courses are important in preparation for health professional schools. The AAMC Admissions Initiative has identified development of cultural competence, ethics, communication skills and background in human behavior as critical in the competencies of future physicians. Because of this, students should take multiple courses in social science, humanities and ethics.

The major allows students to customize their development for the scientific and non-scientific competencies for health professions schools. Students are also advised to chart their progress through an e-portfolio and fill out their academic preparation with experiences in service, clinical settings, teamwork, reliability, and in leadership. Experience in being responsible for the well-being of others is a key factor in preparation for the health professions.

Information concerning preparation for admission to schools of medicine, dentistry, physician assistant, optometry, podiatry, pharmacy, physical therapy, occupational therapy, public health, post-baccalaureate nursing, as well as information on several other allied health careers, is available for all majors from the Center for Health Science Advising, 219 Jordan Hall of Science.

BACHELOR OF SCIENCE WITH A MAJOR IN PREPROFESSIONAL STUDIES

PREPROFESSIONAL SCIENCE SEQUENCE

(124 semester hour credits; 64 science hour credits minimum)

First Year
First Semester
Writing 3
MATH 10350 Calculus I 4
CHEM 10171 Chemical Principles I 4
University Requirement* 3
University Requirement* 3
Moreau First Year Experience 1

(continued)
Preprofessional Studies

Second Semester
Philosophy or Elective 3
MATH 10360 Calculus II 4
CHEM 10172 Organic Chemistry I 4
Literature 3
University Requirement* 3
Moreau First Year Experience 1

14–17

Sophomore Year
First Semester
CHEM 20273 Organic Chemistry II 4
BIOS 10171 General Biology I 3
BIOS 11173 General Biology I Lab 1
Elective(s) 3–6
Language 3

16

University Requirement 3
Second Semester
CHEM 20274 General Chemistry II 4
BIOS 10172 General Biology II 3
BIOS 11174 General Biology II Lab 1
Elective(s) 3–6
Language 3

16

Junior Year
First Semester
Science Elective 3
PHYS 20210 Physics for Life Sciences I 4
Language or Elective 3
University Requirement 3
Science Elective 3

14

Second Semester
Science Elective 3
Science Elective 3
PHYS 20220 Physics for Life Sciences II 4
Electives 6

16

Senior Year
First Semester
Science Elective 3
Science Elective 3
University Requirement 3
University Requirement 3
Elective 3

15

Second Semester
Science Elective 3
University Requirement 3
Elective 3
Science Elective 3

12

Notes:
1. Students who have completed only six hours of mathematics in the first year of studies may transfer into the program but will be required to complete a mathematics sequence equivalent to MATH 10350, 10360, or MATH 10550, 10560. Students having taken MATH 10250 may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. Those students should see also the discussion on degree credit found later in this section of the Bulletin. With the increased emphasis on Statistics, students should also plan to take a Statistics course as a science elective and for those with AP credit for MATH 10550/10560 the Statistics course will also fulfill their University Requirement for Quantitative Reasoning.
2. All students who have had previous exposure to language will be required to take a placement examination in that language for placement in the proper course if the student wishes to continue in that language for the college requirement. If a student wishes to take a new language, of course, he or she must start from the beginning. Spanish is encouraged.
3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20210.
4. Well developed communication skills are important in healthcare and patient safety and health professions schools require training in written communication. With this in mind, the SCPP major will require a Literature course taught in English, which will also fulfill the University Liberal Arts Requirement 4.
5. Behavioral and social issues have an immense impact on health, and effective healthcare provision and health professions schools have increased their requirements for training in social sciences. Students should plan on taking courses in psychology, sociology, or anthropology. One of these courses may also fulfill University Liberal Arts Requirement 5.
6. Undergraduate Research (e.g. BIOS 48498, CHEM 48498), Teaching Practicum (e.g. BIOS 37491), and Directed Readings (BIOS 48497) may count toward the 24 credits of Science Electives with limits. Undergraduate Research and Teaching is limited to 2 credits per semester, for up to three semesters, for a total of six combined credit hours. Credits above these numbers will be counted in General Electives. Directed Readings are limited to 3 credit hours total.
7. Interested parties may obtain additional information including various statistics from the department Web page. See preprofessional.nd.edu.

Summary of Requirements for the Degree of Bachelor of Science in Preprofessional Studies

<table>
<thead>
<tr>
<th>Category</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td>8</td>
</tr>
<tr>
<td>Chemistry</td>
<td>16</td>
</tr>
<tr>
<td>Mathematics</td>
<td>8</td>
</tr>
<tr>
<td>Physics</td>
<td>8</td>
</tr>
<tr>
<td>Language, Intermediate-level Competency</td>
<td><strong>11</strong></td>
</tr>
<tr>
<td>University Requirements</td>
<td>21</td>
</tr>
<tr>
<td>Moreau First Year Experience</td>
<td>2</td>
</tr>
<tr>
<td>Science Electives</td>
<td>24</td>
</tr>
<tr>
<td>General Electives</td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

124

* One of these courses must be a University Seminar.

** Assumes Intermediate-level Competency in Language was achieved by taking two four-credit and one three-credit courses.

HILLEBRAND CENTER FOR COMPASSIONATE CARE IN MEDICINE

As part of the Department of Preprofessional Studies, the Ruth M. Hillebrand Center for Compassionate Care in Medicine has the mission of advancing the scientific theory and evidence based practice of compassionate care in healthcare and of promoting effective communication skills in physicians, nurses, and allied health professionals. The Center offers courses, programs, and research opportunities to help students gain a scientific and humanistic understanding of the importance of compassionate caring in all patient care as well as an introduction to preventing burnout and promoting personal well-being in the health professions. Students can also be involved in research on the integration of compassionate care in clinical practice.

The following elective courses are regularly offered:

Medical Counseling Skills and Patient-Centered Medicine

Science of Compassionate Care in the Medical Professions

Introduction to Clinical Ethics
Psychology and Medicine
Film and the Physician
Introduction to the American Healthcare System
Spiritualities of Caring in the Helping Professions
Introduction to Personalism in Medicine:
The Pathos Project
Introduction to Hospice and Palliative Care
**MINOR IN COMPASSIONATE CARE IN MEDICINE**

The Minor in Compassionate Care in Medicine (MCCM) provides interdisciplinary training in the science and sustainable practice of compassionate care for future health professionals. The minor is rooted in the biology, neuroscience, and psychology of compassion as it is practically applied to the effective and sustainable care of the sick. The practice of compassionate care not only improves patient outcomes, but also sustains the well-being of the healthcare provider, reducing clinician burnout.

**Program Requirements (15 credit hours):**
- Gateway Course (3 credits): SCPP 30405
- Electives (6 credits): Two courses are required from the list of approved electives in the areas of biology, neuroscience, psychology, ethics, and policy/social justice in medicine.
- Experiential/Skills-Based Courses (total of 3 credits required): Students may satisfy the experiential learning requirements by taking a total of three credit hours of learning through a combination of approved 1-credit seminars, an approved 3-credit SSLP, or an active-learning based 3-credit Medical Counseling Skills course.
- Capstone Project (3 credits): The Capstone Project can be satisfied through a Directed Readings course (i.e., SCPP 46397-06 Directed Readings), or another pre-approved course. For all options, students will be required to complete a 20-page paper integrating the courses and experiences of the CCIM minor. The Capstone Project must be pre-approved by the Director.

To enroll or discuss an interest in the program, please schedule a consultation with Dominic Vachon, the John G. Sheedy, MD Director of the Hillebrand Center, at dvachon@nd.edu.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Science Preprofessional. Course descriptions can be found by clicking on the subject code and course number in the search results.

**COLLEGIATE SEQUENCE PROGRAMS**

The three collegiate sequence programs, science-business, science-computing, and science-education, were instituted in 1987. These three programs allow students to obtain a strong science background while simultaneously preparing them for professions in health care, business, computing or education.

**SCIENCE-BUSINESS COLLEGIATE SEQUENCE**

The Science-Business Collegiate Sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates courses from the basic areas of business along with the four basic areas of science. The major prepares students to pursue health care professional education such as medical school, dental school, public health, or health care administration. It also enables students to attain a diversified background to enter an MBA program leading to a position in the scientific or health professions business area. It is also a complete and sufficient program to enable the B.S. graduate of the sequence to enter the scientific business market immediately upon graduation.

Information on the areas of public health and hospital administration, as well as the business needs of the pharmaceutical, biological and chemical industries are available in the office of the Department of Health Professions, 219 Jordan Hall of Science.

The other departments in the College of Science as well as the colleges of arts and letters and business administration provide all course instruction in the curricula of the Science-Business Collegiate Sequence.

**BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-BUSINESS**

All science-business majors take the following basic sequence of science courses:

- General Biology (BIOS 10171–10172 and 11173–11174)
- CHEM 10171 and 11171 and 10172 and 11172 and two of the following: CHEM 20273 and 21273, CHEM 20274 and 21274, SC 20110, CHEM 10122
- Calculus (MATH 10350–10360 or 10550–10560) 1,2
- Physics (PHYS 20210–20220) 1 and 21210, 21220
- Statistics (ACMS 20340 or BIOS 40411)

They also are required to take 20–21 credits of science electives, 4 completing a minimum of 64 credits of science courses.

Also required for the major are the following business and economics courses:

- Principles of Microeconomics (ECON 10010 or 20010) 1,4
- Accountancy 1 (BASC 20100)
- Corporate Financial Management (BASC 20150)

Principles of Management (BASC 20200)
Principles of Marketing (BASC 20250)

One upper-level business elective for which prerequisites are completed.

Requirements for the program are summarized in the table following this section.

**Notes:**

1. Equivalent or higher-level sequences in science may be substituted, e.g., MATH 10850–10860 for MATH 10550–10560.
2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 10360 or MATH 10550, 10560. Students having taken MATH 10250, (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit, found later in this section of the Bulletin.)
3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20220.
4. The choice by the student of the elective courses in science for the program will be discussed with the student and will be based on the future industrial or health professions interests of the student. Any major-level College of Science courses (i.e., those taken to meet science-major requirements and not those designated as “Recommended University electives”) and that are not being used to fulfill other specific graduation requirements can be used to satisfy the “Science Elective” requirement. Major-level geology courses cross-listed as science courses may be taken as science electives. Students are restricted to no more than two credits per semester (six total) for science credit and three credits per semester (nine total) for graduation credit of courses such as Undergraduate Research or Directed Readings.
5. The economics requirement for this major is fulfilled by taking Principles of Microeconomics either in the first year (ECON 10010) or in the sophomore year (ECON 20010). Note: The course ECON 1318I (Social Science University Seminar) will not fulfill the economics requirement for this major.
6. For this major, the University social science requirement will be fulfilled by the required economics course. Additional social science courses are recommended and will count toward the student’s general electives.

**Suggested Curriculum for the Degree of Bachelor of Science in the Science-Business Collegiate Sequence (124 semester hour credits: 64 science hour credits, minimum)**

**First Year**

**First Semester**
- CHEM 10171, 11171
- MATH 10350 or 10550. Calculus (Note 2)
- University Requirement
- Moreau First Year Experience

**Second Semester**
- MATH 10360 or MATH 20171
- PHYS 20210, 20220
- ECON 10010

**Second Year**

**First Semester**
- CHEM 20273, 21273
- MATH 20210
- ECON 20010
- Corporate Financial Management (BASC 20150)
- Principles of Management (BASC 20200)

**Second Semester**
- CHEM 20274, 21274
- MATH 20220
- ECON 20200
- Experiential/Skills-Based Courses (total of 3 credits required)
- Capstone Project (3 credits)

**Third Year**

**First Semester**
- CHEM 30173, 31173
- MATH 30210
- ECON 30100
- Electives 6 credits

**Second Semester**
- CHEM 30174, 31174
- MATH 30220
- ECON 30200
- Electives 6 credits

**Fourth Year**

**First Semester**
- CHEM 40173, 41173
- MATH 40210
- ECON 40100
- Electives 6 credits

**Second Semester**
- CHEM 40174, 41174
- MATH 40220
- ECON 40200
- Electives 6 credits

**To Table of Contents**
Second Semester
CHEM 10172 and 11172 4
MATH 10360 or 10560 Calculus 4
University Requirement 6
ECON 10010* 3
Moreau First Year Experience 1

Sophomore Year
First Semester
BIOS 10170 Biology I 3
BIOS 11170 Biology I Lab 1
CHEM 20273, 21273 (or SC 20110, 21110) 4
Language 3
Elective 3

Second Semester
BIOS 10172 Biology II 3
BIOS 11174 Biology II Lab 1
CHEM 20274, 21274 or CHEM 10122 4 (3)
Language 3
BASC 20100 (ACCT) 3

Junior Year
First Semester
Science Elective or
SC 20110, 21110 Planet Earth 3 (4)
PHYS 20210, 21210 Physics for Life Sciences I 4
BASC 20200 (MGT) 3
University Requirement 3
Science Elective 3

Second Semester
BIOS 40411. Biostatistics or
ACMS 20340 Statistics for Life Sciences 4 (3)
PHYS 20220, 21220 Physics for Life Sciences II 4
BASC 20150 (FIN) 3
Science Electives 6

Senior Year
First Semester
Science Electives 6
Elective 3
BASC 20250 (MKT) 3
University Requirement 3

Second Semester
Science Electives 6
Electives 6
Business Elective 3

* One of these courses must be a University Seminar.

15 (17)

SCIENCE-COMPUTING COLLEGIATE SEQUENCE

The science-computing collegiate sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates courses from the four basic areas of science along with a sequence of computing courses. The program will give the student working knowledge of various computer languages and experience using current computer technology. By choosing science electives appropriately, the student has the option of focusing in an area in science of particular interest. Graduates of this program earn a B.S. degree and are able to enter the scientific computing job market immediately upon graduation.

The other departments in the College of Science as well as the colleges of arts and letters and engineering provide all course instruction in the curricula of the Science-Computing Collegiate Sequence.

BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-COMPUTING

All science-computing majors take the following basic sequence of science courses:

General Biology (BIOS 10171–10172 and 11173 and 11174)*

CHEM 10171 and 11171, 10172 and 11172 and two of (CHEM 20273 and 21273, CHEM 20274 and 21274, SC 20110), CHEM 10122 Calculus (MATH 10350–10360 or 10550–10560) 1,2

Physics (PHYS 20210–20220 and 21210–21220) 3

Statistics (ACMS 20340 or BIOS 40411) They also are required to take 20–21 credits of science elective,* completing a minimum of 64 credits of science courses.

They also are required to complete 14–15 credits in computing courses.

Please see advisor for information on possible sequences in computing.

Requirements for the program are summarized in the table on the following page.

Notes:
1. Equivalent or higher-level sequences in science may be substituted, e.g., MATH 10850–10860 for MATH 10550–10560.

2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10550, 106300 or MATH 10550, 10560. Students having taken MATH 10250 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10550, 10560. (See also the discussion on science degree credit found later in this section of the Bulletin.)

3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20220.
Preprofessional Studies

### SCIENCE-EDUCATION COLLEGIATE SEQUENCE

The science-education collegiate sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates many courses from the four basic areas of science along with education courses that most states require to give the student the background necessary to receive a certificate to teach in a secondary education system. Information concerning the requirements for secondary education in the various states, as well as the general course requirements for a certificate necessary to teach science in a secondary education program, is available in the College of Science office, 248 Nieuwland.

The other departments in the College of Science and the other colleges of the University, as well as the Education Department at Saint Mary’s College, provide all course instruction in the curricula of the Science-Education Collegiate Sequence.

### BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-EDUCATION

All science-education majors take the following basic sequence of science courses:

- General Biology (BIOS 10171–10172 and 11173–11174)\(^1\)
- CHEM 10171 and 10172 and (CHEM 20273 and 21273, CHEM 20274 and 21274) or (CHEM 20273 AND 21273, ENVG 20110) OR (SC 20110, ENVG 20120)\(^1\)
- Calculus (MATH 10350–10360 or 10550–10560)\(^1,2\)
- Physics (PHYS 20210–20220)\(^3\) and 21210, 21220

They also are required to take 20 credits of science electives,\(^4,5\) completing a minimum of 60 credits of science courses.

Also required for the major are the following education courses taught by Saint Mary’s College:

- EDUC 201 Teaching in a Multicultural Society
- EDUC 220 Applied Media and Instructional Technology
- EDUC 345 Curriculum and Assessment in the High School Setting
- EDUC 346 Instructional Strategies and Classroom Management in the High School Setting
- EDUC 350 Educational Psychology: Human Growth and Development of the Adolescent
- EDUC 356 Educational Psychology: Educating Exceptional Learners
- EDUC 449 Teaching Science in the Secondary School
- EDUC 475 Student Teaching in the Secondary School (spring of senior year)

The education courses are those required in the State of Indiana but are also those that are required most often by the educational accrediting agencies of most states. The practical teaching experience which is required will also be arranged through the Education Department at Saint Mary’s College.

Requirements for the program are summarized in the table above.

### SUMMARY OF MINIMAL REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN A COLLEGIATE SEQUENCE MAJOR

<table>
<thead>
<tr>
<th>Science-Business</th>
<th>Science-Computing</th>
<th>Science-Education</th>
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<tbody>
<tr>
<td>Biological Sciences</td>
<td>8</td>
<td>8</td>
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<tr>
<td>Chemistry</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Organic Chemistry/Geology</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Mathematics</td>
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</tr>
<tr>
<td>Physics</td>
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<td>8</td>
</tr>
<tr>
<td>Statistics: ACMS 20340 or BIOS 40411</td>
<td>3–4</td>
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<tr>
<td>Science Electives</td>
<td>20–21</td>
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<tr>
<td>Total Required Science</td>
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<td>Business Courses</td>
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<td>Computing Courses</td>
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<tr>
<td>Language</td>
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<td>University Requirement</td>
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<tr>
<td>Moreau First Year Experience</td>
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<tr>
<td>Free Electives</td>
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<td>10(^*)</td>
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<td>Total</td>
<td>124</td>
<td>124</td>
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</tbody>
</table>

\(^*\) One of these courses must be a University Seminar.

\(^*\) Assumes intermediate-level competency in language achieved by taking two 4.0-credit and one 3.0-credit courses.

Notes:

1. Equivalent or higher-level sequences in science may be substituted, e.g., MATH 10850–10860 for MATH 10550–10560.
2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 10360 or MATH 10550, 10560. Students having taken MATH 10250 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found in this section.)
3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20220.
4. The choice by the student of the elective courses in science for the Science-education program will be based upon the requirements and list of courses suggested by the various state educational systems. Since the timing of the course work is particularly constrained for this major, the student should work closely with his or her advisors: an associate dean in the College of Science and an assigned advisor in the Education Department at Saint Mary’s College.
Special Programs

5. Any major-level College of Science courses (i.e., those taken to meet science-major requirements and not those designated as "Recommended University electives") and that are not being used to fulfill other specific graduation requirements can be used to satisfy the "Science Elective" requirement. Major-level geology courses cross-listed as science courses may be taken as science electives. Students are restricted to no more than two credits per semester (six total) for science credits and three credits (nine total) for graduation credit of courses such as Undergraduate Research or Directed Readings.

Suggested Curriculum for the Degree of Bachelor of Science in the Science-Education Collegiate Sequence (124 semester hour credits: 60 science hour credits, minimum)

First Year
First Semester
CHEM 10171 and 11171 4
MATH 10350 or 10550 Calculus (Note 2) 4
University Requirement 9
Moreau First Year Experience 1

Second Semester
CHEM 10172 and 11172 4
MATH 10360 or 10560 Calculus (Note 2) 4
Elective* 3
University Requirement 9
Moreau First Year Experience 1

Sophomore Year
First Semester
BIOS 10171 Biology I 3
BIOS 11173 Biology I Lab 1
SC 20110 Planet Earth / 21110 or CHEM 20273 and 21273 4
Language 3
Education 201F (SMC) 3
Elective 3

Second Semester
BIOS 10172 Biology II 3
BIOS 11174 Biology II Lab 1
CHEM 20274 and 21274, or CHEM 10122 4 (3)
Language or Elective 3
Fine Arts/Literature 3
EDUC 220 (SMC) 3

Junior Year
First Semester
PHYS 20210, 21210 Physics for Life Sciences I 4
Science Electives 6
EDUC 345 (SMC) 3
EDUC 356 (SMC) 3

Second Semester
PHYS 20220, 21220 Physics for Life Sciences II 4
Science Electives 8
EDUC 350 (SMC) 3
EDUC 346 (SMC) 3

Senior Year
First Semester
Science Electives 6
EDUC 449 (SMC) 3
University Requirement 6

Second Semester
EDUC 475 (SMC) 12

* One of these must be a University Seminar

Special Programs

DOUBLE MAJORS IN SCIENCE

In certain instances, students have the option of pursuing majors in two departments in the College of Science. Combinations that are normally approved include: Biological Sciences with Chemistry; Biological Sciences with Mathematics; Biological Sciences with Physics; Biochemistry with Mathematics; Biochemistry with Physics; Chemistry with Mathematics; Chemistry with Physics; Environmental Sciences (first major) with Mathematics; Mathematics with Physics; and Science Business, Science Computing, Science Education with supplementary major in ACMS or Statistics. Examples of combinations that are normally forbidden include: Preprofessional Studies with any other science majors, Collegiate Sequence majors (Science Business, Science Computing, Science Education) with any other science majors except supplementary majors in ACMS and Statistics, parallel subprograms such as Mathematics and Life Sciences with Physics-in-Medicine and either of those with Biological Sciences or Biochemistry, any majors among Mathematics, ACMS and Statistics. All requirements of each major must be met, with no exceptions. Failing to complete a required course terminates that major for a student. Every student who wishes to major in two departments in the College of Science must prepare an agenda of specific courses to be taken, which both advisors and the dean must approve. This should be done as early as possible, but absolutely no later than the seventh day of the senior year. In certain instances, a student may possibly receive approval of a normally forbidden combination of majors, but only if a specific program has been set up by the seventh day of the sophomore year.

All double major programs in science are extremely challenging programs that require that the student take four or five science courses at a time. Thus, only students of superior scholastic ability should consider this as an option.

Students are warned that it is almost certain that completing a double major in two sciences will require total credits well over the college minimum of 124. Conflicts in scheduling of required courses may occur; neither the college nor the departments undertake to reschedule courses for the sake of double majors. For these reasons, it must be emphasized that completing a double major may well require more than four years. Only one degree is awarded (degrees in science do not specify a field).

Dual Degree Program with the College of Engineering

Please refer to the Bulletin section under the heading “College of Engineering.”

Dual Degree Program with the Mendoza College of Business

Coordinators:
Neil Mangus
Director of Admissions
Malgorzata Dobrowska-Furdyna
Associate Dean, College of Science

Program of Studies. The dual degree five-year program in the Mendoza College of Business and the College of Science enables the student to earn the master of business administration and bachelor of science degrees in a major in one of the five undergraduate departments in the College of Science.

This program, instituted in 1994, offers students the opportunity to better integrate studies in science and in management. The student completing this program will have a background in management as well as the first professional degree in one of the undergraduate majors of the College of Science. Because it is a demanding program, only those students of superior scholastic ability who have the aptitude, motivation and maturity necessary for the combined graduate and undergraduate program should apply. Those with outstanding internship experiences in business will be looked upon favorably. Advisors for the program are available for consultation about the advisability of applying for the program and about meeting the particular needs of students pursuing this program.

The program is open only to those currently enrolled Notre Dame students who have completed three years of an undergraduate science first major.
Students interested in making application for the MBA/Science program should apply to the MBA program during their junior year. They should take the GMAT by December of their junior year. All candidates must schedule a personal interview as a part of the MBA admissions process. Students must also declare their intentions to the dean’s office in the College of Science and request that a dean’s eligibility letter be sent to the MBA Office for them.

An applicant who is not admitted to the dual degree MBA/Science program continues in the undergraduate program and completes his or her science major in the usual four-year period.

As a general guide, it is expected that a student accepted to this program will take two courses for the undergraduate degree during the summer session following his or her junior year. Every dual-degree student is also expected to participate in the orientation for the MBA program. This program will occupy the entire day for the two weeks prior to the first day of classes. Orientation is mandatory for all students beginning the MBA program.

Students in the five-year science/MBA program are also required to:

1. Complete a minimum of 48 MBA credit hours and maintain a GPA of at least 3.0 to successfully complete the program.
2. Take all MBA courses in their fourth year.
3. Maintain full-time student status (minimum coursework of 12 credit hours per semester). Credit hours can come from science or MBA programs.

The MBA curriculum divides each semester into two modules. In addition to the courses required to complete undergraduate and University requirements, students must complete the following MBA course work:

Summer Session Following Junior Year:
- Math Review Workshop* 0
- Accf Review Workshop* 0
(Science Undergraduate Requirements 6)

Senior Year—(Science Undergraduate Requirements Each Semester 3–7)
- First Semester, Module 1:
  - ACCT 60100. Financial Accounting 2
  - MBET 60340. Conceptual Foundation of Business Ethics 2
  - MGT 60100. Statistics 2
  - MGT 60300. Organizational Behavior 2
- First Semester, Interterm Week:
  - Professional Development Seminar 1
  - Communications Seminar++ 1
- First Semester, Module 2:
  - ACCT 60200. Cost Accounting 2
  - FIN 60400. Finance I 2
  - FIN 60210. Microeconomic Analysis 2
  - MARK 60100. Marketing Management 2
- Second Semester, Module 3:
  - FIN 70600. Finance II 2
  - FIN 60220. Macroeconomic Analysis 2
- MGT 60900. Strategic Decision Making 2
- Free Elective 2
- Second Semester, Interterm Week:
  - Values in Decision Making 1
  - Elective Course 1
- Second Semester, Module 4:
  - MGT 60400. Leadership and Teams 2
  - MGT 60700. Operations Management 2

Fifth Year—(Science Undergraduate Requirements Each Semester 3–7)
- First Semester, Module 1:
  - MGT 60200. Problem Solving 2
  - Management Communication Elective I 2
  - Free Elective 2
- Interterm Week:
  - OPTIONAL: Two one-credit-hour electives (TBD) OR
  - Corporate Case Studies OR
  - Offshore Program: China or Brussels 2
- First Semester, Module 2:
  - Ethics Elective 2
  - Management Communication Elective II 2
- Second Semester, Module 3:
  - Free Electives 4
  - (Floating Optional Elective 2)
  *Students have the option to take one additional two-credit-hour elective now or in any remaining module.
- Second Semester, Interterm Week:
  - OPTIONAL: Two one-credit-hour electives OR
  - Corporate Case Studies OR
  - Offshore Program: China or Brussels 2
  - Second Semester, Module 4:
  - Free Electives 4
  - (Floating Optional Elective 2)
*See “Arts and Letters Core” on the first page of the College of Engineering section.
++Special one/two-week courses. All other MBA courses are seven weeks in length.
*Occurs during August Orientation

Total for both degrees: 126–132 undergraduate, 48 MBA

Students involved in the MBA/Science program will complete their undergraduate program while completing MBA requirements. MBA course work will not apply to the undergraduate degree. Sample schedules for particular majors are available from advisors or the dean’s office. Students who are behind in the completion of their major requirements are strongly recommended to obtain permission and advising before applying to the joint program.

Nondepartmental Courses

COURSE DESCRIPTIONS
All of the courses associated with this academic program can be found online at registrar.nd.edu/students/class_search.php. The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject Science (Non-departmental). Course descriptions can be found by clicking on the subject code and course number in the search results.

Science Degree Credit

Courses are generally taken in the College of Science for one of three reasons: (1) for students in either the College of Arts and Letters, or the Mendoza College of Business, or the School of Architecture, to fulfill a University requirement; (2) for students in either the College of Engineering or the College of Science to fulfill a college requirement; and (3) for students in the College of Science, to fulfill a major requirement. As a result, the College of Science offers different sequences of courses which overlap considerably in content but not level. Thus it is possible for a student who has changed his or her college or major to have taken two courses which overlap in content. Both courses will appear on the student’s transcript, but only one will count for degree credit.

As a guideline for the student and the student’s advisors, listed below are the groups of courses that overlap considerably in content. (Courses within the same group are shown in the same row and are also enclosed within parentheses; courses listed within the same column generally show a typical normal progression through course work.) In every case, only one course per group should be counted for degree credit. Generally, only the course taken last should be counted. Students and advisors are warned not to use these groups when moving between course sequences but rather to seek advice from the offering department or the College of Science office.

For overlap with courses no longer taught in the year of publication of this Bulletin, please refer to previous editions of this Bulletin.

Credit is not given for both ACMS and MATH courses with the numbers 10140, 10150, 20210, 20340, 20610, 20750, 30440, 30530, 30540, 30610, or any course cross-listed between ACMS and MATH. In the following table the restrictions on MATH courses numbered 10140 and 20340 also apply to the ACMS courses with the same numbers.
### Applied and Computational Mathematics and Statistics

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### Biological Sciences

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### Chemistry and Biochemistry

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### Mathematics

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### Physics

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<tr>
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<td>MATH 20580</td>
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</table>

Note also that no degree credit is given to any students for MATH 10101; additionally, science majors will not receive degree credit for MATH 10120 or MATH 10110.
Officers of Administration

In the College of Science

MARY E. GALVIN, Ph.D.
Dean of the College of Science

SR. KATHLEEN CANNON, O.P., DMIN.
Associate Dean of the College of Science

STEVEN A. CORCELLI
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REV. JAMES K. FOSTER, C.S.C., M.D.
Assistant Dean of the College of Science

KATHLEEN J.S. KOLBERG, Ph.D.
Assistant Dean of the College of Science

In the Departments and Programs

CRISLYN D’SOUZA-SCHOREY, Ph.D.
Chair of the Department of Biological Sciences

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Chair of the Department of Chemistry and Biochemistry

BEI HU, Ph.D.
Chair of the Department of Applied and Computational Mathematics and Statistics

RICHARD HIND, Ph.D.
Chair of the Department of Mathematics

PETER M. GARNAVICH
Chair of the Department of Physics

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Chair, Preprofessional Studies

KASTURI HALDER, Ph.D.
Director of the Center for Rare and Neglected Diseases

IAN CARMICHAEL, Ph.D.
Director of the Radiation Laboratory

DAVID W. SEVERSON
Director of the Eck Family Global Health Institute

DAVID R. HYDE, Ph.D.
Kenn Director of the Center for Zebrafish Research

MARK A. SUCKOW, D.V.M.
Director of the Freimann Life Sciences Center

FRANCIS J. CASTELLINO, Ph.D.
Director of the W.M. Keck Center for Transgene Research

M. SHARON STACK, Ph.D.
Director of the Harper Cancer Research Institute

Advisory Council

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Chicago, Illinois

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Friday Harbor, Washington

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Nokomis, Florida

MR. JAMES C. MARCUCCI
Fort Wayne, Indiana

MR. LAWRENCE A. MASTROVICH
Teabuco

To Table of Contents
Faculty

The following is the official faculty roster for the 2020–21 academic year as of July 8, 2020. This roster includes faculty members who are on leave during the academic year. The date in parentheses at the close of each entry is the year the individual joined the Notre Dame faculty.

Ahmed Noman Abbasi. Professor, IT, Analytics and Operations; Joe and Jane Giovannini Professor of Information Technology, Analytics, and Operations. Bachelor of Science, Virginia Polytechnic Institute, 2001; Master of Business Admin, ibid., 2004; Philosophiae Doctor, University of Arizona, 2008 (2020)

Hussein Ali Abdulzater. Assistant Professor, Classics. B Electrical Engineering, American University of Beirut, 2006; Master of Arts, ibid., 2007; Master of Philosophy, Yale University, 2010; Philosophiae Doctor, ibid., 2013 (2016)

Christopher Paul Abram. Professor, English. Bachelor of Arts, University of Cambridge, 1998; Master of Philosophy, ibid., 1999; Philosophiae Doctor, ibid., 2004 (2013)

Nicolette Louise Achec. Research Professor, Biological Sciences. Bachelor of Science, Saint Louis University, 1992; Master of Science, Texas A&M University, 1995; Philosophiae Doctor, Uniformed Services Health Sci., 2004 (2013)

Carl Bruce Ackermann. Nolan Professorship for Excellence in Undergraduate Instruction; Teaching Professor, Finance. Bachelor of Arts (Latin), Amherst College, 1984; Philosophiae Doctor, UNC at Chapel Hill, 2000 (1998)

David Acton. Assistant Professor of the Practice, Snite Museum. Bachelor of Arts, University of Michigan, 1976; Master of Arts, ibid., 1979; Philosophiae Doctor, ibid., 1993 (2013)

Ellis Adjei Adams. Assistant Professor, Keough School of Global Affairs. Bachelor of Science, Kwame Nkrumah Univ. of Sci.&Tec, 2007; Master of Science, Michigan Technological Universi, 2011; Philosophiae Doctor, Michigan State University, 2016 (2020)

Christopher Adkins. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Coll of William & Mary, 1995; Master of Arts, Boston University, 2001; Doctor of Philosophy, Coll of William & Mary, 2009 (2016)

Sree Sai Satish Adusumilli. Assistant Professor of the Practice; Concurrent Assistant Professor of the Practice, Biological Sciences. Master of Science, Indian Vet Research Inst., 2002; Philosophiae Doctor, Univ of Missouri-Columbia, 2007 (2016)

John Felix Affleck-Graves. The Notre Dame Chair in Finance; Professor, Finance. B.S. Mathematics, University of Cape Town, 1972; Master of Science, ibid., 1974; Philosophiae Doctor, ibid., 1977; B.S. Commerce, ibid., 1982 (1986)

Pedro Aguilara-Mellado. Assistant Professor, Romance Languages and Literatures. Bachelor of Arts, University of Granada, 2009; Master of Arts, ibid., 2010; Master of Arts, University of Michigan, 2013; Philosophiae Doctor, ibid., 2017 (2018)

Tan Ahn. Assistant Professor, Physics. Bachelor of Science, SUNY at Stony Brook, 2002; Master of Science, ibid., 2004; Philosophiae Doctor, ibid., 2008 (2014)


Josephine Sarpong Akosa. Assistant Research Professor, IT, Analytics and Operations. Bachelor of Science, Kwame Nkrumah Univ. of Sci.&Tec, 2011; Bachelor of Science, ibid., 2011; Bachelor of Science, ibid., 2011; Master of Science, University of Texas at El Paso, 2014; Master of Science, ibid., 2014; Philosophiae Doctor, Oklahoma State University, 2018 (2020)


Maurizio Albahari. Associate Professor, Anthropology; Fellow, Joan B. Kroc Institute for International Peace; Fellow, Kellogg Institute for International Studies; Concurrent Associate Professor, Keough School of Global Affairs. Bachelor of Arts, Universita Degli Studi, 2000; Master of Arts, Univ California Irvine, 2002; Philosophiae Doctor, ibid., 2006 (2008)

Nahid Erfan Alexandrou. Associate Advising Professor, Center for University Advising. Bachelor of Science, Purdue University, 1979; Master of Science, ibid., 1981; M.S. Engineering, ibid., 1985 (1991)

Alex Himonas Alexandrou. Professor, Mathematics. Bachelor of Science, University of Patras, 1976; Master of Science, Purdue University, 1982; Philosophiae Doctor, ibid., 1985 (1989)

Maria Alexandrova. Assistant Professor of the Practice, Biological Sciences. Doctorate of Medicine, Yaroslav-the-Wise Novgorod St., 2002; Diploma in Post-Grad Studies, Saint Petersburg Medical Acad., 2004; Master of Science, Minnesota State University, 2008; Doctor of Philosophy, Southern Illinois University Carbondale, 2012 (2018)

Roger Paul Alford. Professor, Law School; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies; Concurrent Professor, Keough School of Global Affairs. Bachelor of Arts, Baylor University, 1985; Master of Divinity, Southern Baptist Theological S, 1988; Juris Doctor, New York University, 1991 (2012)

James Edward Allemann. Teaching Professor, Civil & Envr Engr & Earth Sciences; Director, Civil and Environmental Engineering Professional Master's Program. Bach of Sci in Civil Engr, University of Notre Dame, 1971; Master of Engineering, ibid., 1972; Philosophiae Doctor, ibid., 1978 (2019)

George Alex Ambrose. Professor of the Practice, Kaneh Ctr for Teaching and Learning. Bachelor of Arts, Rutgers State University of NJ, 2002; Master of Arts Education, Rutgers University, 2003; Philosophiae Doctor, Nova University, 2013 (2008)

Brooke Ammerman. Instructor, Psychology. Bachelor of Science, North Dakota State University, 2011; Master of Arts, University of Northern Iowa, 2013; Philosophiae Doctor, Temple University, 2018 (2018)


Selena Kathleen Anderson. Assistant Professor, School of Architecture. Bachelor of Arts, DePaul University, 2005; Master of Architecture, University of Notre Dame, 2009; Philosophiae Doctor, La Sapienza Univ. of Rome, 2016 (2009)
Faculty


Corey M. Angst. Professor, IT, Analytics and Operations. Bach of Sci in Mech Engr, Western Michigan University, 2001; Master of Business Admin, University of Delaware, 2006; Philosophiae Doctor, University of Maryland, 2007 (2007)

Wendy Angst. Teaching Professor, Management & Organization. Bachelor of Science, Michigan State University, 1995; Master in Health Administratio, University of La Verne, 2000 (2010)

Panos J. Antsaklis. H. Clifford and Evelyn A. Brouse Professor of Electrical Engineering; Professor, Electrical Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics; Concurrent Professor, Computer Science and Engineering. Diploma, Natl Technical Univ of Athens, 1972; Master of Science, Brown University, 1974; Philosophiae Doctor, ibid., 1977 (1980)

Robert Scott Appleby. Professor, History; Dean, Kennaugh School of Global Affairs. Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, University of Chicago, 1979; Philosophiae Doctor, ibid., 1985 (1994)

Ani Aprahamian. The Frank M. Freimann Professor of Physics; Professor, Physics. Bachelor of Arts, Clark University, 1980; Philosophiae Doctor, ibid., 1986 (1989)

Francisco Jose Aragon. Associate Professor of the Practice, Institute for Latino Studies. Bachelor of Arts, Univ of California Berkeley, 1989; Master of Arts, New York University, 1990; Master of Arts, Univ California Berkeley, 1989; Master of Engineering.

Neil Arner. Assistant Professor, Theology. Bachelor of Science, Georgia Institute of Technolog, 2001; Master of Divinity, Princeton Theological Seminary, 2006; Master of Sacred Theology, Yale University-Div School, 2007; Master of Arts, ibid., 2011; Master of Philosophy, Yale University, 2011; Philosophiae Doctor, ibid., 2012 (2013)

Carolina Arroyo. Associate Teaching Professor, Political Science. Bachelor of Arts, SUNY at Buffalo, 1983; Master of Arts, Stanford University, 1990 (1996)

Brandon Lee Ashfeld. Associate Professor, Chemistry and Biochemistry. Bachelor of Science, University of Minnesota, 1998; Philosophiae Doctor, Univ of Texas-Austin, 2004 (2007)

James Matthew Ashley. Associate Professor, Theology. Bachelor of Science, Saint Louis University, 1982; Master of Teacher Science, Weston School of Theology, 1988; Philosophiae Doctor, University of Chicago, 1993 (1993)

Badir Assaf. Frank M. Freimann Assistant Professor of Physics; Assistant Professor, Physics. Bachelor of Science, American University of Beirut, 2009; Philosophiae Doctor, Northeastern University, 2014 (2018)


Feraz Azhar. Assistant Professor, Philosophy. Bachelor of Science, University of Sydney, 2000; Master of Science, University of Cambridge, 2002; Philosophiae Doctor, Univ of California Sta Barbara, 2008; Master of Science, University of Sydney, 2014; Philosophiae Doctor, University of Cambridge, 2017 (2019)

Susan Elizabeth Azyndar. Associate Librarian, Library Law. Bachelor of Arts, University of Redlands, 1997; Master of Arts, University of Wyoming, 1999; Juris Doctor, University of Arizona, 2008; Master of Library & Info Sci, University of Washington, 2011 (2020)

Ruediger Bachmann. Step Family Associate Professor of Economics; Professor, Department of Economics. Master of Arts, University of Mainz, 1999; Master of Arts, ibid., 1999; Master of Arts, ibid., 2001; Master of Arts, ibid., 2001; Master of Arts, Yale University, 2002; Master of Philosophy, ibid., 2004; Philosophiae Doctor, ibid., 2007 (2014)

Brad Alan Badertscher. DeLotto and Touche Professor of Accountancy; Professor, Accountancy; PW Faculty Fellow. Master of Business Admin, University of Iowa, 2001; Bachelor of Arts, Univ. of Nebraska at Kearney, 2001; Philosophiae Doctor, University of Iowa, 2007 (2007)


Christopher Baglow. Professor of the Practice, McGrath Institute for Church Life. Bachelor of Arts, Franciscan Univ Steubenville, 1990; Master of Arts, University of Dallas, 1996; Philosophiae Doctor, Duquesne University, 2000 (2018)

Marcio Bahia. Associate Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, Federal Univ of Minas Gerais, 2001; Master of Arts, University of Ottawa, 2004; Doctor of Philosophy, ibid., 2011 (2016)

Brian M. Baker. Rev. John A. Zahn, C.S.C. Professorship of Structural Biology in the Department of Chemistry and Biochemistry; Department Chair, Chemistry and Biochemistry; Professor, Chemistry and Biochemistry. Bachelor of Science, New Mexico State Univ. Park, 1992; Philosophiae Doctor, University of Iowa, 1997 (2001)


Christopher Gordon Ball. Fellow, Joan B. Kroc Institute for International Peace; Associate Professor, Anthropology; Director of Graduate Studies. Bachelor of Arts, Univ of California Sta Barbara, 1996; Master of Arts, University of Chicago, 2003; Philosophiae Doctor, ibid., 2007 (2013)
Dinshaw S. Balsara. Concurrent Professor, Applied Computational Mathematics & Statistics; Professor, Physics. Bachelor of Science, Jai Hind College, 1977; Master of Science, Indian Inst of Tech Kanpur, 1982; Master of Science, University of Chicago, 1986; Philosophiae Doctor, Univ of IL Urbana-Champaign, 1990 (2001)

Christina Bambrick. Assistant Professor, Political Science. Bachelor of Arts, Scripps College, 2013; Master of Arts, Univ of Texas-Austin, 2015; Philosophiae Doctor, ibid., 2019 (2020)

Zygmunta Guido Baranski. Professor, Romance Languages and Literatures; R.L. Canala Professor of Romance Languages and Literatures; Director of Graduate Studies, Romance Languages and Literatures. Italian. Bachelor of Arts, University of Hull, 1973; Philosophiae Doctor, ibid., 1976 (2007)

Sotirios Angel Barber. Professor, Political Science. Bachelor of Arts, Univ of IL Urbana-Champaign, 1964; Master of Arts, University of Chicago, 1967; Philosophiae Doctor, ibid., 1973 (1986)

Stephanie Barclay. Associate Professor, Dean’s Office-Law School. Bachelor of Science, Brigham Young University - ID, 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Bachelor of Science, ibid., 2008; Juris Doctor, Brigham Young University, 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011; Juris Doctor, ibid., 2011 (2020)

Daniel W Bardayan. Professor, Physics. B.S. Physics, Tennessee Technological Univ, 1993; Master of Science, Yale University, 1994; Master of Philosophy, ibid., 1997; Philosophiae Doctor, ibid., 1999 (2013)

Justin Dewayne Barfield. Assistant Teaching Professor, Art, Art History, and Design. Bachelor Degree - Unspecified, Southeastern Louisiana Univ, 2009; Master of Fine Arts, University of Notre Dame, 2013 (2013)

Christopher Andrew Baron. Associate Professor, Classics; Concurrent Associate Professor, History. Bachelor of Arts (Latin), Illinois Wesleyan University, 1995; Master of Arts, University of Chicago, 2006; Philosophiae Doctor, Univ of Pennsylvania, 2006 (2006)


Martin Patrick Barron. Assistant Teaching Professor, IT, Analytics and Operations. Bachelor of Arts, Univ of Dublin Trinity College, 2013; Bachelor of Arts, Trinity College, 2013; Bachelor of Arts, ibid., 2013; Bachelor of Arts, ibid., 2013; Bachelor of Science, University of Notre Dame, 2015; Master of Science, University of Notre Dame, 2015; Master of Science, ibid., 2015; Master of Science, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2018 (2020)

Katrina D. Barron. Associate Professor, Mathematics. B.S. Mathematics, University of Chicago, 1986; B.S. Physics, ibid., 1987; Philosophiae Doctor, Rutgers University, 1996 (2001)

Kevin Barry. Teaching Professor, Kaneb Ctr for Teaching and Learning; Senior Director, Kaneb Center for Teaching and Learning; Fellow, Institute for Latin Studies; Concurrent Professional Specialist, Computing and Digital Technology Program - Arts and Letters. Bachelor of Science, Florida Institute of Technolog, 1988; Master of Science, ibid., 1990 (1994)

David M. Bartels. Concurrent Professional Specialist, Chemistry and Biochemistry; Research Professor, Radiation Laboratory. Bachelor of Science, Hope College, 1977; Philosophiae Doctor, Northwestern University, 1982 (2003)

Viva Ona Bartkus. Associate Professor, Management & Organization; Fellow, Center for Social Concerns. Bachelor of Arts, Yale University, 1989; Master of Arts, ibid., 1989; Master of Arts, University of Oxford, 1991; Philosophiae Doctor, ibid., 1993 (2004)

Andrew Charles Bartolini. Assistant Teaching Professor, Dean’s Office-Coll. of Engineering; Concurrent Assistant Teaching Professor, Civil & Envr Eng & Earth Sciences. Bach of Sci in Civil Engr, University of Notre Dame, 2013; Doctor of Philosophy, ibid., 2019 (2020)

Mary Kathryn Batistich. Assistant Research Professor, Department of Economics. B.A. Economics, University of Notre Dame, 2012; Master of Science, Purdue University, 2016 (2020)


Steven J Battin. Assistant Professor, Theology. Bachelor of Science, Xavier University, 1997; Master of Theological Studies, University of Notre Dame, 2005; Philosophiae Doctor, ibid., 2014; Philosophiae Doctor, ibid., 2014; Undeclared, Loyola Univ New Orleans, (2017)


Christiane Baumeister. Associate Professor, Department of Economics. Bachelor of Arts, University of Bayreuth, 1999; Master of Arts, University of Siena, 2003; Philosophiae Doctor, University of Ghent, 2010 (2015)

Timothy James Bays. Associate Professor, Philosophy. Bachelor of Arts, Northwestern University, 1988; Philosophiae Doctor, Univ. of California-Los Angeles, 1994; Philosophiae Doctor, ibid., 1994; Philosophiae Doctor, ibid., 1999; Philosophiae Doctor, ibid., 1999 (1999)

Jeffrey Charles Beall. O’Neill Family Professor; Professor, Philosophy. Bachelor of Arts, Grove City College, 1989; Master of Divinity, Princeton Theological Seminary, 1992; Philosophiae Doctor, Univ of Massachusetts, 1998 (2020)

Erik Lewis Beardsley. Assistant Professor, Accountancy. Bachelor of Business Admin., University of Wisconsin Center, 2008; Master of Science, ibid., 2009; Doctor of Philosophy, Texas A&M University, 2016 (2016)

Edward N. Beatty. Professor, History. Bachelor of Arts, Princeton University, 1983; Master of Arts, University of New Mexico Main, 1992; Philosophiae Doctor, Stanford University, 1996 (2000)

Casey Lynn Beatty. Assistant Professor, Air Science. Bachelor of Arts, University West Florida, 2013; Master of Arts, American Military University, 2018 (2020)

Emily Scott Beck. Assistant Professor of the Practice; Associate Professor of the Practice, Art, Art History, and Design. Bachelor of Arts, Meredith College, 2001; Master of Fine Arts, UNC at Chapel Hill, 2010 (2013)

Christine Ann Becker. Associate Professor, Film, Television, and Theatre. Bachelor of Arts, Univ of IL Urbana-Champaign, 1993; Master of Arts, Univ of Wisconsin-Madison, 1995; Philosophiae Doctor, ibid., 2001 (2000)
Faculty

Gail Bederman. Associate Professor, History; Concurrent Associate Professor, Gender Studies. Bachelor of Fine Arts, New York University, 1978; Master of Arts, Brown University, 1984; Philosophiae Doctor, ibid., 1992 (1992)

Timothy C. Beers. Professor, Physics; Grace-Rupley Professor of Physics. B.S. Physics, ibid., 1979; Bachelor of Science, Purdue University, 1979; Master of Arts, Harvard University, 1980; Philosophiae Doctor, ibid., 1983 (2014)

Mark Joseph Behrens. John and Margaret McAndrews Professor of Mathematics; Professor, Mathematics. Bachelor of Science, University Alabama Tuscaloosa, 1998; Bachelor of Science, ibid., 1998; Bachelor of Science, ibid., 1998; Bachelor of Science, ibid., 1998; Bachelor of Arts, ibid., 1998; Philosophiae Doctor, University of Chicago, 2003 (2014)

Heidi Ann Beidinger. Associate Professor of the Practice, Biological Sciences; Assistant Director of Community Health and Policy. Bachelor of Science, Indiana Univ-Bloomington, 1989; Master of Public Health, University of Ill. at Chicago, 1996; Philosophiae Doctor, Western Michigan University, 2013 (2014)

Alexander Daniel Beilhammer. Heiden Family Professor of Byzantine History; Professor, History. Bachelor of Arts, University of Vienna, 1995; Master of Arts, ibid., 1995; Philosophiae Doctor, ibid., 1999 (2015)

Kimberly Hope Belcher. Assistant Professor, Theology. Bachelor of Science, University of Florida, 2001; Master of Theological Studies, University of Notre Dame, 2003; Philosophiae Doctor, ibid., 2009 (2013)

Anthony Joseph Bellia. Professor, Law School; O'Toole Professorship of Constitutional Law; Concurrent Professor, Political Science; Notre Dame Presidential Fellow. Bachelor of Arts, Canisius College, 1991; Juris Doctor, University of Notre Dame, 1994 (2000)

Patricia Louise Bellia. The William J. and Dorothy K. O'Neill Professor of Law; Professor, Law School; Notre Dame Presidential Fellow. Bachelor of Arts (Latin), Harvard University, 1991; Juris Doctor, Yale University, 1995 (2000)

Judith G Benz. Teaching Professor, German and Russian Lang and Lit. Bachelor of Arts, Coll of William & Mary, 1997; Bachelor of Arts, ibid., 1997; Bachelor of Arts, ibid., 1997; Bachelor of Arts, ibid., 1997; Master of Arts, Yale University, 1999; Master of Arts, ibid., 1999; Master of Arts, ibid., 1999; Master of Arts, ibid., 1999; Master of Philosophy, ibid., 2001; Master of Philosophy, ibid., 2001; Master of Philosophy, ibid., 2001; Master of Philosophy, ibid., 2001; Philosophiae Doctor, ibid., 2007; Philosophiae Doctor, ibid., 2007; Philosophiae Doctor, ibid., 2007 (2020)

Mark Berends. Professor, Sociology; Fellow, Kellogg Institute for International Studies; Associate Vice President for Research. Bachelor of Arts, Calvin College, 1985; Master of Science, Univ of Wisconsin-Madison, 1988; Philosophiae Doctor, ibid., 1992 (2009)

Nicholas Tibor Berente. Associate Professor, IT. Analytics and Operations; Viola D. Hank Associate Professor of IT, Analytics, and Operations. . Associate in Applied Science, Cuyahoga Comm College, 1996; Bachelor of Business Admin., John Carroll University, 1996; Master of Business Admin., Case Western Reserve Univ., 2004; Philosophiae Doctor, ibid., 2008 (2018)

Georg Peter Berg. Research Professor, Physics. Bachelor of Science, University of Groningen, 1968; Diploma, University of Cologne, 1972; Philosophiae Doctor, ibid., 1974 (2009)

Cindy S. Bergeman. Professor, Psychology; Department Chair, Psychology. Bachelor of Science, University of Idaho, 1979; Master of Science, Pennsylvania State University, 1987; Philosophiae Doctor, ibid., 1989 (1990)

Jeffrey Harold Bergstrand. Professor, Finance; Concurrent Professor, Department of Economics; Concurrent Professor, Keough School of Global Affairs. Bachelor of Arts, Northwestern University, 1974; Master of Arts, Univ of Wisconsin-Madison, 1979; Philosophiae Doctor, ibid., 1981 (1986)

Tracy Catherine Bergstrom. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, Smith College, 1998; Bachelor of Arts, ibid., 1998; Bachelor of Arts, Yale University, 2002; Master in Library Science, Southern Connecticut State Col, 2007; Master in Library Science, ibid., 2007; Master of Arts, Yale University, (2018)

Melissa Berke. Concurrent Assistant Professor, Biological Sciences; Assistant Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Arts, Oberlin College, 2000; Master of Science, Univ of California Riverside, 2003; Philosophiae Doctor, University of Minnesota at Dul, 2011 (2013)


Robert James Bernhard. Vice President for Research; Professor, Aerospace and Mechanical Engineering. Bach of Sci in Mech Engr, Iowa State University, 1973; M.S. Mechanical Engr, University of Maryland, 1976; Philosophiae Doctor, Iowa State University, 1982 (2007)

Sara Bernstein. Thomas J. and Robert T. Rolfs Professor; Associate Professor, Philosophy. Bachelor of Arts, University of Chicago, 2004; Master of Arts, University of Arizona, 2008; Philosophiae Doctor, ibid., 2010 (2016)


Seth A. Berry. Assistant Teaching Professor, IT. Analytics and Operations; Assistant Teaching Professor. Bachelor of Arts, Southern Illinois Univ at Carb, 2008; Master of Arts, ibid., 2011; Doctor of Psychology, ibid., 2012 (2012)

Marinho Angelo Bertanha. Assistant Professor, Department of Economics. Bachelor of Science, University of Sao Paulo, 2006; Master of Arts, Fundacao Getulio Vargas de Sao, 2009; Philosophiae Doctor, Stanford University, 2015 (2016)

Nora J. Besansky. Professor, Biological Sciences. Bachelor of Science, Oberlin College, 1982; Master of Science, Yale University, 1987; Philosophiae Doctor, ibid., 1990 (1997)

Philip Hartzel Bess. Professor, School of Architecture; Fellow, Institute for Real Estate. Bachelor of Arts, Whittier College, 1973; Master of Theological Studies, Harvard University, 1976; Master of Architecture, University of Virginia, 1981 (2004)

Laura Wells Betz. Assistant Professor of the Practice, English; Director of Undergraduate Studies. Bachelor of Arts, University of Virginia, 1997; Philosophiae Doctor, University of Maryland, 2005 (2017)

John Renner Betz. Associate Professor, Theology; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Wake Forest University, 1991; Philosophiae Doctor, University of Virginia, 1999 (2010)

Kraig Beyerlein. Associate Professor, Sociology; Director of the Center for Study of Religion & Society. Bachelor of Arts, Concordia University, 1998; Master of Arts, UNC at Chapel Hill, 2002; Philosophiae Doctor, ibid., 2006 (2009)

Kyle James Bibby. Associate Professor, Civil & Environmental Engineering and Earth Sciences; Wanzek Collegiate Chair. Bachelor Degree - Unspecified, University of Notre Dame, 2008; Philosophiae Doctor, Yale University, 2012 (2017)

Zihni Basar Bilgicer. Associate Professor, Chemical and Biomolecular Engineering; Concurrent Associate Professor, Chemistry and Biochemistry. Bachelor of Science, Bogazici Universities, 1998; Philosophiae Doctor, Tufts University, 2004 (2008)

Richard E. Billo. Associate Vice President for Research; Professor, Computer Science and Engineering. Bachelor of Arts, West Virginia University, 1978; Master of Arts, University of the Pacific, 1981; Master of Science, Arizona State University, 1986; Philosophiae Doctor, ibid., 1989 (2013)

Francis Bilson Darku. Assistant Research Professor, IT, Analytics and Operations. Bachelor of Science, Kwame Nkrumah Univ. of Sci.&Tec, 2011; Bachelor of Science, ibid., 2011; Bachelor of Science, ibid., 2011; Bachelor of Science, ibid., 2011; Master of Science, Texas at Dallas, 2017; Master of Science, Texas University Dallas, 2017; Philosophiae Doctor, ibid., 2018 (2020)


Alessia Blad. Director of the Center for the Study of Languages and Cultures; Teaching Professor, Romance Languages and Literatures. Bachelor Degree - Unspecified, Indiana Univ South Bend, 2008; Master of Arts, University of Notre Dame, 2008 (2010)

Brian S. J. Blagg. W. K. Warren Family Director of the Warren Family Research Center for Drug Discovery and Development; Charles L. Huisking Professor, Chemistry and Biochemistry; Professor, Chemistry and Biochemistry. Bachelor of Arts, Sonoma State University, 1994; Bachelor of Arts, ibid., 1994; Bachelor of Arts, ibid., 1994; Bachelor of Arts, ibid., 1994; Philosophiae Doctor, University of Utah, 1999 (2017)


Patricia A. Blanchette. Professor, Philosophy; McMahan-Hank Professor of Philosophy; Bachelor of Arts, Univ. of California-San Diego, 1983; Philosophiae Doctor, Stanford University, 1990 (1993)

Paul Leonard Blaschko. Assistant Teaching Professor, Philosophy. Bachelor of Philosophy, Univ of St. Thomas, 2010; Bachelor Degree - Unspecified, ibid., 2011; Master of Philosophy, Univ of Wisconsin-Milwaukee, 2013; Philosophiae Doctor, University of Notre Dame, 2019 (2018)

Jaimie Bleck. Associate Professor, Political Science; Concurrent Associate Professor, African and African American Studies. Bachelor of Arts, University of Illinois at Chicago, 2003; Master of Arts, Cornell University, 2008; Philosophiae Doctor, ibid., 2011 (2011)


Matt Bloom. Research Professor, Management & Organizations. Bachelor of Science, Baker University, 1983; Master of Arts, University of Kansas, 1989; Philosophiae Doctor, Cornell University, 1996 (1996)

W. Martin Bloomer. Professor, Classics; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Yale University, 1982; Master of Arts, ibid., 1983; Master of Philosophy, ibid., 1984; Philosophiae Doctor, ibid., 1987 (1998)

Susan D. Blum. Professor, Anthropology. Bachelor of Arts (Latin), Stanford University, 1980; Master of Arts, University of Michigan, 1986; Master of Arts, ibid., 1988; Philosophiae Doctor, ibid., 1994 (2000)

Tobias Boes. Associate Professor, German and Russian Languages and Literature. Bachelor of Arts, Reed College, 1999; Master of Philosophy, Yale University, 2003; Philosophiae Doctor, ibid., 2006 (2007)


Timothy Richard Bohling. Teaching Professor, Marketing; Chief Marketing Officer. Bachelor of Business Admin., University of Houston, 1991; Master of Business Admin, ibid., 1993 (2019)

Rachel Bohlmann. Assistant Librarian, Heuberg Library. Bachelor of Arts, Valparaiso University, 1988; Master of Arts, University of Iowa, 1995; Philosophiae Doctor, ibid., 2001; Master of Library & Info Sci, Univ of IL Urbana-Champaign, 2012 (2015)

Paul William Bohn. Arthur J. Schmidt Professor of Chemical and Biomolecular Engineering; Professor, Chemical and Biomolecular Engineering; Professor, Chemistry and Biochemistry. Bachelor of Science, University of Notre Dame, 1977; Philosophiae Doctor, Univ of Wisconsin-Madison, 1981 (2006)

Ashley Jennifer Bohrer. Assistant Professor of Gender and Peace Studies, Kenegh School of Global Affairs; Concurrent Assistant Professor, Gender Studies. Bachelor of Arts, George Washington Univ, 2009; Master of Arts, DePaul University, 2012; Doctor of Philosophy, ibid., 2016 (2019)

Diego Bolster. Director, Graduate Studies; Frank M. Freimann Professor of Engineering, Fellow, Institute for Real Estate; Concurrent Professor, Applied Computational Mathematics & Statistics; Concurrent Professor, Biological Sciences; Professor, Civil & Environmental Engineering & Earth Sciences; Director, Graduate Studies, Civil & Envr Eng & Earth Sciences. Bachelor of Science, University College Dublin, 2002; Master of Science, Univ. of California-San Diego, 2005; Philosophiae Doctor, ibid., 2007 (2010)

Catherine Elizabeth Bolten. Associate Professor, Anthropology; Concurrent Associate Professor, African and African American Studies; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Williams College, 1998; Master of Philosophy, University of Cambridge, 2000; Master of Arts, Univ of Michigan-Dearborn, 2003; Philosophiae Doctor, University of Michigan, 2008 (2009)
Christine M Bonfiglio. Teaching Professor, Alliance for Catholic Education. Bachelor of Arts, Indiana Univ South Bend, 1996; Master of Arts, Western Michigan University, 2002; Philosophiae Doctor, ibid., 2003 (2012)


Francesca Maria Bordogna. Associate Professor, Program of Liberal Studies; Concurrent Associate Professor, History. Philosophiae Doctor, University of Chicago, 1998 (2011)

Tatiana Botero. Teaching Professor, Romance Languages and Literatures. Associate in Arts, Miami-Dade Community College, 1986; Bachelor of Arts, West Virginia University, 1996; Master of Arts Education, ibid., 1997 (2011)

Eileen Hunt Botting. Professor, Political Science; Concurrent Professor, Gender Studies. Bachelor of Arts, Bowdoin College, 1993; Bachelor of Arts, University of Cambridge, 1995; Master of Arts, Yale University, 1997; Master of Philosophy, ibid., 1998; Master of Arts, University of Cambridge, 1999; Philosophiae Doctor, Yale University, 2001 (2001)

Kevin W Bowyer. Schubmehl-Prein Professor of Computer Science and Engineering; Professor, Computer Science and Engineering; Concurrent Professor, Electrical Engineering. B.S. Economics, George Mason University, 1976; Philosophiae Doctor, Duke University, 1980 (1987)

Sunny K. Boyd. Professor, Biological Sciences. Bachelor of Arts, Princeton University, 1981; Master of Science, Oregon State University, 1984; Philosophiae Doctor, ibid., 1987 (1987)

Kathleen Crawford Boyle. Associate Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, Indiana Univ-Bloomington, 2003; Master of Arts, Middlebury College, 2006; Master of Arts, UNC at Chapel Hill, 2006; Philosophiae Doctor, ibid., 2013 (2017)


Travis James Brabec. Assistant Professor, Air Science. B.S. Engineering & Environ Sci, Michigan Technological Univers, 1998; Master of Science, Embry-Riddle Aeronautical Univ, 2007; Master Degree - Unspecified, Air University, 2012 (2018)


Rachel Branco. Assistant Teaching Professor, Chemistry and Biochemistry. Bachelor of Science, Baylor University, 2012; Master of Science, Maastricht University, 2013; Philosophiae Doctor, Emory University, 2018 (2018)

Jay William Brandenberger. Professor of the Practice, Center for Social Concerns; Concurrent Professor of the Practice, Psychology. Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, University of Pittsburgh, 1987; Philosophiae Doctor, ibid., 1990 (1991)

Robert Joseph Brandt. Professor of the Practice, Dean's Office-Offc of Architecture. Bachelor of Science, University of Southern Indiana, 1986; Master of Fine Arts, Indiana State University Main, 1989 (1992)


Paul Raymond Brenner. Associate Professor of the Practice, Center for Research Computing; Concurrent Associate Professor of the Practice, Computer Science and Engineering. Bachelor of Science, University of Notre Dame, 1998; Master of Science, Ohio State University, 2000; Philosophiae Doctor, University of Notre Dame, 2007 (2007)

Sarah Ellen Brenner. Associate Advising Professor, Center for University Advising; Assistant Provost for Academic Advising. Bachelor of Arts, University of Notre Dame, 1998; Master of Arts, Ohio State University, 2003; M.S. Social Work, ibid., 2003 (1995)

Jay Barrett Brockman. Fellow, Institute for Real Estate; Professor of the Practice, Dean's Office-Coll. of Engineering; Director, Center for Civic Innovation; Fellow, Center for Social Concerns. Bachelor of Science, Brown University, 1982; Master of Engineering, Carnegie Mellon University, 1988; Philosophiae Doctor, ibid., 1992 (1992)

James Robert Brockmole. Professor, Psychology. Associate Dean, College of Arts and Letters. Bachelor of Arts, University of Notre Dame, 1999; Master of Arts, Univ of IL Urbana-Champaign, 2001; Philosophiae Doctor, ibid., 2003 (2009)

Maxime Brodeur. Ortenzio Family Assistant Professor of Applied Medical and Nuclear Physics; Associate Professor, Physics. B.S. Physics, University of Montreal, 2003; Master of Science, Univ of British Columbia, 2006; Philosophiae Doctor, ibid., 2010 (2013)

Catherine L Bronson. Assistant Teaching Professor, Classics. Bachelor of Arts, St Xavier University, 1994; Master of Arts, University of Chicago, 2003; Philosophiae Doctor, ibid., 2012 (2014)

Terrance Terrell Brown. Assistant Professor, Film, Television, and Theatre. Bachelor of Arts, Vanderbilt University, 2007; Master of Fine Arts, Northwestern University, 2011 (2020)

Jeremy Phillip Brown. Assistant Professor, Theology. Bachelor of Arts, Reed College, 2001; Bachelor of Arts, ibid., 2001; Bachelor of Arts, ibid., 2001; Master of Arts, New York University, 2013; Master of Arts, ibid., 2013; Master of Arts, ibid., 2013; Master of Arts, ibid., 2013; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015 (2020)

Seth Nathaniel Brown. Professor, Chemistry and Biochemistry. Bachelor of Science, Massachusetts Institute of Tec, 1988; Philosophiae Doctor, Univ of Washington, 1994 (1996)

Jessica Ann Brown. Assistant Professor, Chemistry and Biochemistry. Bachelor of Science, Wright State University, 2005; Philosophiae Doctor, Ohio State University, 2010 (2016)


Merlin L. Bruening. Professor, Chemical and Biomolecular Engineering; Donald and Susan Rice Professor of Engineering; Concurrent Professor, Chemistry and Biochemistry. Bach of Sci in Chemical Eng, Brigham Young University, 1989; M.S. Materials Sci & Engr, ibid., 1990; Philosophiae Doctor, Weizmann Institute of Science, 1995 (2016)

Faculty

Ramzi Kamal Bualuan. Associate Professional Specialist, Computer Science and Engineering. Bachelor of Science, American University of Beirut, 1983; M.S. Electrical Engt, University of Notre Dame, 1986 (1990)

Aimee Prati Buccellato. Associate Professor, School of Architecture; Fellow, Institute for Real Estate. Bachelor of Architecture, University of Notre Dame, 2000; M of Arch Design & Urbanism, Harvard University, 2005 (2008)

Kasey S. Buckles. Associate Professor, Department of Economics; Concurrent Associate Professor, Gender Studies. Bachelor of Arts, University of Kentucky, 2000; Master of Arts, Boston University, 2003; Philosophiae Doctor, University of Notre Dame, 2015 (2019)

Eric John Bugyis. Assistant Teaching Professor, Program of Liberal Studies. Bachelor Degree - Uns pecified, University of Notre Dame, 2005; Master of Arts, Yale University-Div School, 2009; Philosophiae Doctor, University of Notre Dame, 2013 (2020)

Peter James Bui. Associate Teaching Professor, Computer Science and Engineering. Bachelor of Science, University of Notre Dame, 2006; Master of Engineering, ibid., 2010; Philosophiae Doctor, ibid., 2012 (2015)

Richard S. Bullene, CSC. Associate Professor of the Practice, Dean's Off-School of Architecture; Academic Director, Rome Studies Program; Assistant Dean, School of Architecture. Bachelor of Architecture, University of Notre Dame, 1976; Master of Divinity, ibid., 1981; Master of Science, Univ of Pennsylvania, 1992; Philosophiae Doctor, ibid., 1994 (1993)


Thomas Gerard Burish. Professor, Philosophy. Bachelor of Arts, University of Notre Dame, 1972; Master of Arts, University of Kansas, 1975; Philosophiae Doctor, ibid., 1976 (2005)

Jeffrey John Burks. Fellow, Institute for Real Estate; Associate Professor, Accountancy; Deloitte Faculty Fellow. Bachelor of Business Admin., University of Notre Dame, 1997; Master of Business Admin, Creighton University, 2002; Philosophiae Doctor, University of Iowa, 2007 (2007)

Thomas E. Burman. Professor, History; Robert Conwasu Director of the Medieval Institute; Director, Medieval Institute. Bachelor of Arts (Latin), Whitman College, 1984; Master of Arts, University of Toronto, 1986; Philosophiae Doctor, ibid., 1991 (2017)

Peter C. Burns. Henry Massman Professor of Civil Engineering; Professor, Civil & Environmental Engineering & Earth Sciences; Concurrent Professor, Chemistry and Biochemistry. Bachelor of Science, University of New Brunswick, 1988; Master of Science, University of Western Ontario, 1990; Philosophiae Doctor, University of Manitoba, 1994 (1997)


John Busenburg. Assistant Professor, Management & Organization. Bachelor of Science, Indiana University, 2011; Master of Business Admin, Indiana Univ-Bloomington, 2013; Doctor of Philosophy, Arizona State University, 2017 (2019)

Pamela W. Butler. Assistant Teaching Professor, Gender Studies. Bachelor of Arts, Michigan State University, 2001; Philosophiae Doctor, University of Minnesota, 2010 (2016)

Theodore J. Cachey. Albert J. Ravarino Family Director or Devers Program in Dante Studies; Professor, Romance Languages and Literatures; Director, Center for Italian Studies. Bachelor of Arts, Northwestern University, 1978; Master of Arts, Univ.of California-Los Angeles, 1982; Philosophiae Doctor, ibid., 1986 (1990)

Liang Cai. Fellow, Kellogg Institute for International Studies; Assistant Professor, History. Bachelor of Arts, Renmin University Beijing, 1999; Master of Arts, Cornell University, 2003; Philosophiae Doctor, ibid., 2007 (2014)

Peter S. Cajka. Assistant Teaching Professor, American Studies. Bachelor Degree - Unspecified, University of Dayton, 2008; Master Degree - Unspecified, Marquette University, 2010; Philosophiae Doctor, Boston College, 2017 (2020)

Laura Frances Callahan. Assistant Professor, Philosophy. Bachelor of Arts, Indiana Univ-Bloomington, 2011; Bachelor of Arts, St Hilda's College Oxford, 2015; Philosophiae Doctor, Rutgers: The State Univ of NJ, 2019 (2019)

Jon Philip Camden. Concurrent Associate Professor, First Year of Studies; Professor, Chemistry and Biochemistry; Director of Undergraduate Studies. Bachelor of Science, University of Notre Dame, 2000; Philosophiae Doctor, Stanford University, 2005 (2014)

David Edward Campbell. The Packy J. Dee Professor of American Democracy; Professor, Political Science; Department Chair, Political Science. Bachelor of Arts, Brigham Young University, 1996; Master of Arts, Harvard University, 2001; Philosophiae Doctor, ibid., 2002 (2002)

Kathleen Cannon, OP. Professor of the Practice, Dean's Office-College of Science; Associate Dean, College of Science. Bachelor of Arts, Ohio Dominican College, 1965; Master of Arts, Providence College, 1975; Doctor of Ministry, Catholic University of America, 1982 (1990)

Matthew Capdevielle. Professor of the Practice, Univ Writing Program; Director, University Writing Center. Bachelor of Arts, Saint Louis University, 1996; Master of Arts, Saint Johns College at Santa F, 2002; Master of Arts, University of Wisconsin Center, 2004; Philosophiae Doctor, Univ of Wisconsin-Madison, 2009 (2009)

Elizabeth Gibbons Capdevielle. Assistant Teaching Professor, Univ Writing Program. Bachelor of Arts, Saint Louis University, 1997; Master of Arts, Saint Johns College at Santa F, 2002; Master of Arts, Univ of Wisconsin-Madison, 2004; Philosophiae Doctor, ibid., 2012 (2015)

Mark A. Caprio. Associate Professor, Physics; Associate Chair, Physics. Bachelor of Science, Oglethorpe University, 1994; Master of Science, Yale University, 1998; Master of Philosophy, ibid., 1999; Philosophiae Doctor, ibid., 2003 (2007)

William J. Carbonaro. Department Chair, Sociology; Concurrent Associate Professor, First Year of Studies; Associate Professor, Sociology. Bachelor of Arts, Washington University, 1990; Master of Arts, ibid., 1991; Master of Arts, Univ of Wisconsin-Madison, 1996; Philosophiae Doctor, ibid., 2000 (2000)

Clinton Carlson. Associate Professor, Art, Art History, and Design. Bachelor of Fine Arts, Univ. of Nebraska at Kearney, 1997; Master Degree - Unspecified, University of Alberta, 2008 (2019)
Laura A. Carlson. Dean, Graduate School; Vice President and Associate Provost; Professor, Psychology, Bachelor of Arts, Dartmouth College, 1987; Master of Arts, Michigan State University, 1991; Philosophiae Doctor, Univ of II. Urbana-Champaign, 1994 (1994)

Ian C. Carmichael. Professor, Chemistry and Biochemistry; Director, Radiation Laboratory, B.S. Chemistry, University of Glasgow, 1971; Philosophiae Doctor, ibid., 1975 (1976)

Edward Jonathan Caron. Assistant Clinical Professor, Inst for Educational Initiatives; Bachelor of Arts, University of Notre Dame, 1997; Master of Arts, University of Portland, 1999 (2017)

Paolo Giovanni Carozza. Professor, Law School; Concurrent Professor, Political Science; Director, Kellogg Institute for International Studies. Bachelor of Arts (Latin), Harvard University, 1985; Juris Doctor, ibid., 1989 (1996)

Kathleen M. Carr, CSJ. Clinical Professor, Alliance for Catholic Education, Doctorate of Education, Catholic University of America; Master of Education, Boston College, (2011)

Katlyn Marie Carter. Assistant Professor, History. Bachelor of Arts, Univ of California Berkeley, 2009; Master of Arts, Princeton University, 2013; Philosophiae Doctor, ibid., 2017 (2020)

Francis J. Castellino. The Kleiderer-Pezold Chair in Biochemistry; Professor, Chemistry and Biochemistry; Director, W.M. Keck Center for Transgene Research. Bachelor of Science, University of Scranton, 1964; Master of Science, University of Iowa, 1966; Philosophiae Doctor, ibid., 1968 (1970)

Manuela Casti Yeagley. Assistant Research Professor, Management & Organization. Bachelor of Arts, University of Florence, 1993; Master Degree - Unspecified, King's College, 2005; Philosophiae Doctor, ibid., 2015 (2015)

Stefano Castruccio. Assistant Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, Politecnico Di Milano, 2005; Master of Science, ibid., 2007; Philosophiae Doctor, University of Chicago, 2013 (2017)

John C. Cavadini. McGrath-Cavadini Director, Institute for Church Life; Professor, Theology. Bachelor of Arts, Wesleyan University, 1975; Master of Arts, Marquette University, 1979; Master of Arts, Yale University, 1981; Master of Philosophy, ibid., 1983; Philosophiae Doctor, Yale University-Div School, 1988 (1990)

Catherine Rose Cavadini. Associate Teaching Professor, Theology, Theology MA, Director of Graduate Studies. Bachelor of Arts, University of Notre Dame, 2003; Master of Theological Studies, Duke University, 2005; Philosophiae Doctor, University of Notre Dame, 2010 (2010)

Dominic T. Chaloner. Director of Undergraduate Studies, Environmental Sciences; Associate Teaching Professor, Biological Sciences. Bachelor of Science, University of London, 1991; Philosophiae Doctor, ibid., 1995 (2001)

Patricia A. Champion. Associate Professor, Biological Sciences. Bachelor of Science, Carnegie Mellon University, 1998; Master of Arts, Princeton University, 2000; Philosophiae Doctor, ibid., 2003 (2009)

Matthew Maurice Champion. Associate Professor, Chemistry and Biochemistry. Bachelor of Science, University of Iowa, 1997; Philosophiae Doctor, Texas A&M University, 2005 (2009)

Tsz Man Vanessa Chan. Assistant Teaching Professor, Psychology. Bachelor of Science, McGill University, 2014; Master of Arts, University of Toronto, 2015 (2020)

Hsueh-Chia Chang. The Bayer Corporation Chair in Engineering; Professor, Chemical and Biomolecular Engineering; Concurrent Professor, Aerospace and Mechanical Engineering. Bachelor of Science, California Institute of Techno, 1976; Philosophiae Doctor, Princeton University, 1980 (1987)

Mayland Chang. Research Professor, Chemistry and Biochemistry. Bachelor of Science, Sorbonne University, 1977; Bachelor of Science, Univ of Southern California, 1981; Philosophiae Doctor, University of Chicago, 1985 (2003)

Michael Joseph Chapple. Teaching Professor, IT; Analytics and Operations. Bach of Sci in Computer Sci, University of Notre Dame, 1997; M.S. Computer Sci and Engr, University of Idaho, 2000; Master of Business Admin, Auburn University, 2004; Philosophiae Doctor, University of Notre Dame, 2009 (2005)

Alex E. Chavez. Assistant Professor, Anthropology; Nancy O’Neill Associate Professor of Anthropology. Bachelor of Arts, Univ of Texas-Austin, 2004; Master of Arts, ibid., 2006; Philosophiae Doctor, ibid., 2010 (2014)


Danny Ziyi Chen. Professor, Computer Science and Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, Univ of San Francisco, 1985; Master of Science, Purdue University, 1988; Philosophiae Doctor, ibid., 1992 (1992)

Huazhi Chen. Assistant Professor, Finance. Bachelor of Arts, Case Western Reserve Univ., 2006; Bachelor of Science, ibid., 2006; Master of Science, ibid., 2009; Master Degree - Unspecified, London School of Econ & Pol Sc, 2010; Philosophiae Doctor, ibid., 2016 (2018)

Yixing Chen. Assistant Professor, Marketing. Master of Business Admin, University of New Mexico, 2015; Master of Business Admin, ibid., 2015; Master of Business Admin, ibid., 2015; Master of Business Admin, ibid., 2015 (2020)

Ying Cheng. Associate Professor, Psychology. Bachelor of Arts, Anhui Institute of Technology, 2003; Bachelor of Engineering, Univ of Science and Technology, 2003; Master of Science, Univ of II. Urbana-Champaign, 2007; Philosophiae Doctor, ibid., 2008 (2008)

Joseph Cherian. Teaching Professor, Marketing. Master of Science, University of Missouri-Rolla, 1982; Master of Science, ibid., 1982; Master of Science, ibid., 1982; Master of Science, ibid., 1982; Doctor of Philosophy, Univ of Texas-Austin, 1986 (2017)

Meredith S.Chesson. Associate Professor, Anthropology; Concurrent Associate Professor, Gender Studies; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Brown University, 1989; Master of Arts, Harvard University, 1993; Philosophiae Doctor, ibid., 1997 (2000)

David Chiang. Associate Professor, Computer Science and Engineering. Bachelor of Arts, Harvard University, 1997; Master of Science, ibid., 1997; Philosophiae Doctor, Univ of Pennsylvania, 2004 (2014)
Jeffrey Kaplan Chilcote. Assistant Professor, Physics. Bachelor of Physics, Northwestern University, 2008; Master of Science, Univ.of California-Los Angeles, 2010; Philosophiae Doctor, ibid., 2014 (2018)

Jonathan David Chisum. Assistant Professor, Electrical Engineering. Bachelor of Science, Seattle Pacific University, 2003; Master of Science, Univ of Colorado-Boulder, 2008; Philosophiae Doctor, ibid., 2011 (2015)

Peter Abe Cholak. Professor, Mathematics. Bachelor of Arts, Union College University, 1984; Master of Science, Univ of Wisconsin-Madison, 1988; Master of Arts, University of Wisconsin Center, 1988; Philosophiae Doctor, ibid., 1991 (1994)

Elizabeth Ann Chorvat. Associate Teaching Professor, Accountancy. Master of Law, University of Virginia, 2004; Master of Law, University of Michigan, 2008; Master of Public Administration, Harvard University, 2009; Juridicae Scientiae Doctor, University of Michigan, 2013; Philosophiae Doctor, University of Chicago, 2013 (2020)

Christopher Chowrimootoo. Concurrent Assistant Professor, Music; Assistant Professor, Program of Liberal Studies. Bachelor of Arts, Jesus College Oxford, 2006; Master of Arts, University of Oxford, 2007; Master of Arts, Harvard University, 2009; Philosophiae Doctor, ibid., 2013 (2013)

Andrea Lynn Christensen. Assistant Teaching Professor, Inst for Educational Initiatives; Associate Director, Inst for Educational Initiatives. Bachelor of Arts, University of Notre Dame, 2006; Bachelor of Arts, ibid., 2006; Philosophiae Doctor, ibid., 2012 (2012)

Kenneth Christensen. Viola D. Hask Professor of Aerospace and Mechanical Engineering; Professor, Aerospace and Mechanical Engineering; Department Chair, Aerospace and Mechanical Engineering. Bach of Sc in Mech Engr, University of New Mexico Main, 1995; M.S. Mechanical Engr, California Institute of Techno, 1996; Philosophiae Doctor, Univ of IL Urbana-Champaign, 2001 (2014)


Justin Thomas Christy. Assistant Teaching Professor, Philosophy. Bachelor Degree - Unspecified, SUNY College at Geneseo, 2011; Master of Arts, University of Notre Dame, 2013; Philosophiae Doctor, ibid., 2017 (2020)

Mathew A. Chrystal. Assistant Professor of the Practice, Science Computing. Bachelor of Science, California State Polytechnic, 1983; Master of Science, University of Minnesota, 1997; Philosophiae Doctor, ibid., 2001 (2001)

Tarryn Li-Min Chun. Concurrent Assistant Professor, East Asian Languages and Cultures; Assistant Professor, Film, Television, and Theatre. Bachelor of Arts, Princeton University, 2006; Master of Arts, Harvard University, 2010; Philosophiae Doctor, ibid., 2016 (2017)

Austin Chung. Assistant Professor, Naval Science. Bach of Sc in Electrical Eng, Villanova University, 2013 (2018)

David Ashton Clairmont. Associate Professor, Theology. Bachelor of Arts, University of Notre Dame, 1996; Master of Arts, Uni of Chicago School Divinity, 2000; Philosophiae Doctor, ibid., 2005 (1994)

James Clancy. Assistant Research Professor, Biological Sciences. B.S. Biology, Univ of California-San Diego, 2005; Master of Science, ibid., 2006; Philosophiae Doctor, University of Notre Dame, 2014 (2014)

Ryan Keith Clark. Associate Clinical Professor, Alliance for Catholic Education. Bachelor of Arts, University of Notre Dame, 1995; Master of Arts, University of Portland, 1998; Philosophiae Doctor, Univ of Oregon, 2007 (2006)

Lee Anna Clark. The William J. and Dorothy K. O'Neil Professor of Psychology; Professor, Psychology. Bachelor of Arts, Cornell University, 1972; Master of Arts, ibid., 1977; Philosophiae Doctor, Univ of Minnesota of Minneapolis, 1982 (2010)

Patricia L. Clark. Professor, Chemistry and Biochemistry. Bachelor of Science, Georgia Institute of Technol, 1991; Philosophiae Doctor, University Texas Medical Schoo, 1997 (2001)

Patrick J. Clauss. Professor of the Practice, Univ Writing Program. Bachelor of Science, Indiana Univ-Bloomington, 1990; Master of Arts, Indiana State University Main, 1992; Philosophiae Doctor, Ball State University, 1999 (2008)


Walter Louis Clements. Teaching Professor, Finance; Teaching Professor. Bachelor of Science, Indiana Univ-Bloomington, 1981; Master of Business Admin, University of Chicago, 1986 (2012)

Joanne E. Clifford. Clinical Professor, Dean's Office-Law School; Professor of the Practice. Bachelor of Science, Ohio State University, 1993; Juris Doctor, University of Virginia, 2001 (2011)

Jenna Elizabeth Coalson. Assistant Professor, Specialist, Global Health Masters. Doctorate Degree, University of Michigan, (2019)


Anne G. Coleman. Associate Professor, American Studies; Concurrent Associate Professor, History. Bachelor of Arts, Williams College, 1987; Master of Arts, Univ of Colorado-Boulder, 1992; Philosophiae Doctor, ibid., 1996 (2009)

Jon Thomas Coleman. Professor, History; Concurrent Professor, American Studies. B.A. History, Univ of Colorado-Boulder, 1992; Master of Arts, ibid., 1997; Doctorate Degree, Yale University, 2003 (2004)

Kristen Collett-Schnitt. Associate Teaching Professor, Finance; Associate Dean for Specialized Master's Programs, Mendoza College of Business. Bachelor of Arts, Bellarmine College, 2003; Master of Education, North Carolina State University, 2004; Philosophiae Doctor, ibid., 2008 (2008)

Brian Scott Collier. Associate Professor of the Practice, Alliance for Catholic Education. Bachelor of Arts, Loyola University Chicago, 1995; Master of Arts, Colorado State University, 2000; Philosophiae Doctor, Arizona State University, 2006 (2009)

James Michael Collins. Professor, Film, Television, and Theatre; Concurrent Professor, American Studies; Concurrent Professor, English; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University of Iowa, 1975; Philosophiae Doctor, ibid., 1984 (1985)
Faculty

Susan Collins. Associate Professor, Political Science; Book Editor, Review of Politics. Bachelor of Arts, University of Alberta, 1984; Master of Arts, ibid., 1987; Philosophiae Doctor, Boston College, 1994 (2013)

Austin Ignatius Collins, CSC. Professor, Art, Art History, and Design; Religious Superior of Corby Hall. Bachelor of Arts, University of Notre Dame, 1977; Master of Divinity, Graduate Theological Union, 1981; Master of Fine Arts, Claremont Graduate School, 1986 (1986)

Robert Albright Collinson. Fellow, Institute for Real Estate; Assistant Professor, Department of Economics; Wilson Family LEO Assistant Professor. Bachelor of Arts, College of Wooster, 2007; Master of Arts, University of Chicago, 2009; Philosophiae Doctor, New York University, 2019 (2019)

Philippe A. Collon. Professor, Physics; Associate Chair, Physics. Bachelor of Science, Universite Catholique De Louva, 1993; Philosophiae Doctor, Wirtschaftsuniversitat Wien, 1999 (2003)

Maria S. Coloma. Associate Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, Nat’l University of San Marcos, 1984; Master of Arts, University of Pittsburgh, 1998 (2000)

Yamil Javier Colon. Assistant Professor, Chemical and Biomolecular Engineering. Bach of Sci in Chemical Engr, University of Notre Dame, 2009; Philosophiae Doctor, Northwestern University, 2015 (2018)

Jason A. Colquitt. Franklin D. Schura Professor of Management; Professor, Management & Organization. Bachelor of Science, Indiana Univ-Bloomington, 1994; Bachelor of Science, ibid., 1994; Bachelor of Science, ibid., 1994; Philosophiae Doctor, Michigan State University, 1999; Philosophiae Doctor, ibid., 1999; Philosophiae Doctor, ibid., 1999 (2020)

Michael E. Connors, CSC. Associate Professor of the Practice, Theology. Bachelor of Arts, Illinois College, 1977; Master of Divinity, University of Notre Dame, 1983; Doctor of Theology, University of Toronto, 1997 (1997)

Ann-Marie Conrad. Concurrent Associate Professor, Anthropology; Associate Professor, Art, Art History, and Design. Bachelor of Fine Arts, University of Notre Dame, 1993; Master of Arts, University of Chicago, 2003 (2007)

Michael John Coppedge. Professor, Political Science. Bachelor of Science, Randolph-Macon Woman’s College, 1979; Master of Arts, Yale University, 1982; Philosophiae Doctor, ibid., 1988 (1995)

Steven A Corcelli. Professor, Chemistry and Biochemistry; Associate Dean, Dean’s Office-College of Science; Fellow, Office of the Provost. Bachelor of Science, Brown University, 1997; Doctor of Science, Yale University, 2002 (2005)

Erin Bernadette Corcoran. Concurrent Associate Teaching Professor, Joan B. Kroc Institute for International Peace; Associate Teaching Professor, Joan B. Kroc Inst. for Int’l Peace. Bachelor of Arts, Montana State University, 1997; Juris Doctor, Georgetown University, 2000 (2020)

Abby Cordova. Associate Professor, Keough School of Global Affairs. Bachelor of Arts, Universidad Centroamericana, 2000; Master of Arts, Vanderbilt University, 2003; Master of Arts, ibid., 2003; Master of Arts, ibid., 2005; Master of Arts, ibid., 2005; Philosophiae Doctor, ibid., 2008 (2020)

Thomas C. Corke. Clark Equipment Professor of Aerospace and Mechanical Engineering; Professor, Aerospace and Mechanical Engineering. Bachelor of Science, Illinois Institute of Technolo, 1974; Master of Science, ibid., 1976; Philosophiae Doctor, ibid., 1981 (1999)

Kirsten Leigh Cornelson. Assistant Professor, Department of Economics. B.A. Economics, Mount Allison University, 2007; Master Degree - Unspecified, University of Toronto, 2008; Philosophiae Doctor, ibid., 2017 (2017)

Patrick Michael Corrigan. Associate Professor, Law School. Bachelor of Arts, University of Notre Dame, 2007; Master of Public Administration, Harvard University, 2011; Juris Doctor, New York University, 2015 (2019)

David Cortez. Assistant Professor, Political Science. B.S. Political Science, Pan American University, 2011; Master Degree - Unspecified, Cornell University, 2014; Philosophiae Doctor, ibid., 2017 (2018)

Shane A. Corwin. Professor, Finance. Bachelor of Science, Mankato State University, 1990; Master of Business Admin, ibid., 1992; Philosophiae Doctor, Ohio State University, 1996 (2000)

Therese Charlotte Cory. Associate Professor, Philosophy. Master of Arts, Catholic University of America, 2007; Philosophiae Doctor, ibid., 2009 (2015)

David Christopher Cory. Assistant Teaching Professor, Philosophy. Bachelor of Arts, Ave Maria Coll of the Americas, 2005; Master of Arts, Catholic University of America, 2009; Philosophiae Doctor, ibid., 2018 (2016)


Michael J. Cramer. Associate Professor of the Practice, UNDERC. Assistant Director, UNDERC. Bachelor of Arts, Earlham College, 1994; M.S. Biology, Texas Tech University, 1998; Philosophiae Doctor, University of Cincinnati, 2006 (2007)


Drew Dennis Creal. Patrick J. O’Malley III and Christine A. O’Malley Associate Professor of Economics; Associate Professor, Department of Economics. Bachelor of Arts, Cornell University, 1999; Master of Arts, University of Washington, 2004; Philosophiae Doctor, ibid., 2007 (2018)

James Patrick Creech. Associate Advising Professor, Center for University Advising. Bachelor of Arts, UNC at Chapel Hill, 2003 (2012)

Colleen Mary Creighton. Associate Professional Specialist, Accountancy. Bachelor of Business Admin., University of Notre Dame, 1979; Master of Science, DePaul University, 1981 (2016)

Klaas Jan Martijn Cremers. Martin J. Gillen Dean of the Mendoza College of Business; Bernard J. Hank Professor of Finance; Professor, Finance; Concurrent Professor, Law School; Fellow, Kellogg Institute for International Studies; Dean, Mendoza College of Business. Master of Science, Vrije Universiteit, 1997; Philosophiae Doctor, New York University, 2002 (2012)

Justin Crepp. Associate Professor, Physics. B.S. Physics, Pennsylvania St University, 2003; Philosophiae Doctor, University of Florida, 2008 (2012)
Paola Crippa. Assistant Professor, Civil & Environmental Engineering & Earth Sciences; Assistant Professor, Applied Computational Math & Stats. B.S. Engineering & Environ Sci, Politecnico Di Milano, 2005; Bach of Sci in Enventional Engr, ibid., 2007; Philosophiae Doctor, Indiana Univ-Bloomington, 2013 (2017)

Christopher J. Cronin. Assistant Professor, Department of Economics. Bachelor of Arts, Georgetown College, 2008; Bachelor of Science, ibid., 2008; Master of Science, UNC at Chapel Hill, 2011; Philosophiae Doctor, ibid., 2014 (2014)

Jennifer Lynne Cronin. Assistant Teaching Professor, Management & Organization. Bachelor of Arts, Georgetown College, 2005; Master of Arts, University of Kentucky, 2009; Philosophiae Doctor, UNC at Chapel Hill, 2014 (2018)


Craig Richard Crossland. Department Chair, Management & Organization; Associate Professor, Management. Bachelor of Science, University of Queensland, 1995; Master of Business Admin, University College Dublin, 2001; Philosophiae Doctor, Pennsylvania State University, 2008 (2013)

Hal Robert Culbertson. Teaching Professor, Kenng School of Global Affairs. Bachelor of Arts, Wheaton College, 1986; Master of Philosophy, Univ. of IL Urbana-Champaign, 1990; Juris Doctor, ibid., 1991; Master of Arts, University of Notre Dame, 1996 (1997)

Patricia Jane Culligan. Matthew H. McCluskey Dean of Engineering; Dean, College of Engineering; Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, University of Leeds, 1982; Master of Philosophy, University of Cambridge, 1985; Philosophiae Doctor, ibid., 1989 (2020)

Kathleen Sprongs Cummings. Professor, American Studies; Professor, History; Rev. John A. O’Brien Professor; Concurrent Professor, Gender Studies; Fellow, Nanovic Institute for European Studies; Concurrent Associate Professor, Theology; Director, Causha Center for Study American Catholicism. Bachelor of Arts, University of Scranton, 1993; Master of Arts, ibid., 1993; Master of Arts, University of Notre Dame, 1994; Philosophiae Doctor, ibid., 1999 (2001)

Edward Mark Cummings. William J. Shaw Center for Children and Families Professor; Professor, Psychology. Bachelor of Arts, Johns Hopkins University, 1972; Master of Arts, Univ.of California-Los Angeles, 1973; Philosophiae Doctor, ibid., 1977 (1996)

Barry Cushman. John P. Murphy Foundation Professor of Law; Professor, Law School; Concurrent Professor, Political Science; Concurrent Professor, History. Bachelor of Philosophy, Amherst College, 1982; Juris Doctor, University of Virginia, 1986; Master of Arts, ibid., 1986; Philosophiae Doctor, ibid., 1995 (2012)

Brian Christopher Cutter. Assistant Professor, Philosophy. Bachelor of Arts, Whitman College, 2009; Philosophiae Doctor, Univ of Texas-Austin, 2015 (2016)

Adam Maciej Czajka. Assistant Professor, Computer Science and Engineering; Concurrent Assistant Professor, Electrical Engineering. Master of Engineering, Warsaw University, 2000; Philosophiae Doctor, Technical University of Warsaw, 2005 (2016)

Nan Zhang Da. Assistant Professor, English. Bachelor of Arts, University of Chicago, 2006; Philosophiae Doctor, University of Michigan, 2014 (2014)

Zhi Da. Professor, Finance; Notre Dame Professor of Finance; Notre Dame Professor of Finance. Bachelor of Arts, National University of Singapo, 1999; M.S. Engineering, ibid., 2001; Philosophiae Doctor, Northwestern University, 2006 (2006)

Laurel Daen. Assistant Professor, American Studies. Bachelor of Arts, Wesleyan University, 2005; Bachelor of Arts, ibid., 2005; Bachelor of Arts, ibid., 2005; Master of Arts, ibid., 2005; Master of Arts, Coll of William & Mary, 2011; Master of Arts, ibid., 2011; Master of Arts, ibid., 2011; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016 (2020)

Anthony Joseph D’agostino. Fellow, Kellogg Institute for International Studies; Assistant Professor of the Practice, Inst for Educational Initiatives. Bachelor Degree - Unspecified, University of Notre Dame, 2004 (2006)

John Deak. Associate Professor, History; Concurrent Associate Professor, German and Russian Language and Literature; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, UNC at Chapel Hill, 1998; Master of Arts, University of Chicago, 2000; Philosophiae Doctor, ibid., 2009 (2009)


Richard James deBoer. Assistant Research Professor, Physics. Bachelor of Science, Western Michigan University, 2002; Master of Science, Ball State University, 2003; Philosophiae Doctor, University of Notre Dame, 2012; Undeclared, Southwestern Michigan College, (2012)
Faculty

Alan Robert DeFrees. Professor of the Practice, Dean’s Off-School of Architecture; James A. and Louise F. Nolen Associate Professor of Architecture. Bachelor of Architecture, University of Notre Dame, 1974 (1996)

Mark Dehmow. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, University of Maine at Orono, 2000; Bachelor of Mathematics, ibid., 2000; Master of Library & Info Sci, Univ of Illinois-Chicago, 2004 (2001)


Juan Del Valle. W. K. Warren Family Associate Professor for the Warren Family Research Center for Drug Discovery and Development; Associate Professor, Chemistry and Biochemistry. Bachelor of Arts, Carleton College, 1999; Philosophiae Doctor, Univ. of California-San Diego, 2004 (2019)

Louis A. DelFra. Associate Teaching Professor, Alliance for Catholic Education; Director of Pastoral Life. Bachelor of Arts, University of Notre Dame, 1992; Master of Divinity, ibid., 2003 (2007)


JoAnn DellaNeva. Professor. Romance Languages and Literatures; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Bryn Mawr College, 1976; Master of Arts, Univ of Pennsylvania, 1978; Master of Arts, Princeton University, 1980; Philosophiae Doctor, ibid., 1982 (1982)

Denise M. DellaRossa. Teaching Professor, German and Russian Lang and Lit; Director of Undergraduate Studies, German and Russian Languages and Literature; Fellow, Nanovic Institute for European Studies. Bachelor of Arts (Latín), Montana State University, 1989; Master of Arts (Latín), Mississippi St Univ, 1991; Philosophiae Doctor, Univ of Wisconsin-Madison, 2002 (2006)


Patrick Deneen. Professor, Political Science; David A. Potenziani Memorial College Professor of Constitutional Studies. Bachelor of Arts, Rutgers University, 1986; Philosophiae Doctor, ibid., 1995 (2012)

Michael Desch. Professor, Political Science; The Tuckey J. Dee Professor of Political Science; Brian and Jeannele Brady Family Director of the Notre Dame International Security Center; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Marquette University, 1982; Master of Arts, University of Chicago, 1984; Philosophiae Doctor, ibid., 1988 (2008)

Diane Alfred Desierto. Associate Professor, Keough School of Global Affairs; Fellow, Kellogg Institute for International Studies. Bachelor Degree - Unspecified, University of the Philippines, 2000; Master of Law, Yale Law School, 2009; Juridicae Scientiae Doctor, ibid., 2011 (2018)

Sarvanan Devaraj. Fred V. Duda Professor of Business; Professor, IT, Analytics and Operations; Director, Notre Dame California. Bachelor of Science, Bangalore University, 1989; Master of Science, University of Alabama, 1991; Philosophiae Doctor, University of Minnesota, 1997 (1996)

Tarek Dika. Assistant Professor, Program of Liberal Studies. Bachelor of Arts, University of Michigan, 2005; Master of Arts, Johns Hopkins University, 2010; Doctor of Philosophy, ibid., 2013 (2016)

Jeffrey Alan Diller. Professor, Mathematics. Bachelor of Science, University of Dayton, 1988; Philosophiae Doctor, University of Michigan, 1993 (1998)


Taryn Lee Dinkelman. Associate Professor, Department of Economics; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Rhodes University, 1997; Master Degree - Unspecified, University of the Witwatersrand, 2001; Philosophiae Doctor, University of Michigan, 2008 (2018)

David Gyula Dobolyi. Assistant Research Professor, IT, Analytics and Operations. Bachelor of Arts, University of Maryland, 2007; Bachelor of Arts, ibid., 2007; Bachelor of Arts, ibid., 2007; Bachelor of Arts, ibid., 2007; Master of Arts, University of Virginia, 2012; Master of Arts, ibid., 2012; Master of Arts, ibid., 2012; Master of Arts, ibid., 2012; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015; Philosophiae Doctor, ibid., 2015 (2020)

Malgorzata Dobrowolska-Furdyna. Professor, Physics; Associate Dean for Undergraduate Studies, College of Science. Master of Science, Warsaw University, 1972; Philosophiae Doctor, Polish Academy of Science, 1980 (1987)

Darren Theodore Dochuk. Professor, History; Director of Graduate Studies, History. Bachelor of Arts, Simon Fraser University, 1995; Master of Arts, Queen’s University, 1998; Philosophiae Doctor, University of Notre Dame, 2005 (2015)

Mark B. Doerrries. Associate Professor of the Practice, Sacred Music @ ND; Artistic Director and Administrator of the Sacred Music Academy. Doctor of Musical Arts, Indiana Univ-Bloomington, 2013 (2013)

Anselma T. Dolchich-Ashley. Assistant Teaching Professor, Honors Program in Arts and Sciences. Bachelor of Science, Georgetown University, 1981; Master of Science, ibid., 1983; Master of Divinity, Weston School of Theology, 1988; Philosophiae Doctor, University of Notre Dame, 2011 (2015)

William C. Donahue. The Rev. John J. Cavanagh, C.S.C., Professor of the Humanities; Professor, German and Russian Languages and Literature; Concurrent Professor, Film, Television, and Theatre; Director, Keough School of Global Affairs. Bachelor of Science, Georgetown University, 1981; Master of Theological Studies, Harvard Divinity School, 1984; Master of Arts, Middlebury College, 1987; Philosophiae Doctor, Harvard University, 1995 (2015)

William Leon Donaruma. Professor of the Practice, Film, Television, and Theatre; Creative Director, Office of Digital Learning. Bachelor of Arts, University of Notre Dame, 1989 (1998)

Richard Edward Donnelly. Professor of the Practice, Film, Television, and Theatre; Fellow, Nanovic Institute for European Studies. Bachelor of Fine Arts, University of Wisconsin Center, 1974; Master of Fine Arts, School of the Art Institute of, 1975 (1991)

John Bannon Donovan. Assistant Professor, Accountancy. Bachelor of Business Admin., University of Notre Dame, 2008; Doctor of Philosophy, Washington University, 2016 (2016)

Kirk Bennett Doran. Associate Professor, Department of Economics; Henkels Family Associate Professor; Fellow, Kellogg Institute for International Studies. Master of Science, Harvard University, 2002; Bachelor of Arts, ibid., 2002; Master of Arts, Princeton University, 2005; Philosophiae Doctor, ibid., 2008 (2007)
Faculty

Erika Doss. Professor, American Studies; Concurrent Professor, History; Concurrent Professor, Art, Art History, and Design. Bachelor of Arts, Ripon College, 1978; Master of Arts, University of Minnesota, 1981; Philosophiae Doctor, ibid., 1983 (2007)

Norman J. Dovichi. Grace-Rupley Professor of Chemistry and Biochemistry; Professor, Chemistry and Biochemistry. Bachelor of Science, Northern Illinois Univ, 1976; Philosophiae Doctor, University of Utah, 1980 (2010)

Robert A. Dowd, CSC. Associate Professor, Political Science; Concurrent Associate Professor, Keough School of Global Affairs. Bachelor of Arts, University of Notre Dame, 1987; Master of Divinity, Jesuit School of Theology, 1993; Master of Arts, Univ.of California-Los Angeles, 2001; Philosophiae Doctor, American College for the Appli, 2003 (2001)


Crislyn D’Souza-Schorey. Professor, Biological Sciences. Bachelor of Science, University of Bombay, 1986; Master of Science, ibid., 1988; Philosophiae Doctor, Univ of Texas-San Antonio, 1992 (1998)

Xiaojing Duan. Assistant Teaching Professor, IT, Analytics and Operations. Bachelor of Science, North China Univ of Technology, 2002; Master of Science, Beihang University, 2005; Master of Science, University Southern Mississippi, 2007 (2020)

Alejandro D. Duany. Associate Professional Specialist, School of Architecture; Associate Professor of the Practice. Master of Arts in Architecture, Harvard Graduate Sch. of Des., 1990; Undeclared, Princeton University, (2009)

Shane Kenneth Duarte. Assistant Teaching Professor, Philosophy. Bachelor of Arts, McGill University, 1998; Philosophiae Doctor, Univ of Pennsylvania, 2004 (2017)


Giles E Duffield. Associate Professor, Biological Sciences. Bachelor of Science, University of Nottingham, 1992; Philosophiae Doctor, University of Cambridge, 1998 (2006)

John M Duffy. Professor, English; Director, University Writing Program; Director, O’Malley Director of the University Writing Program. Bachelor of Arts, Boston College, 1977; Master of Arts, University College Dublin, 1979; Master of Arts, Columbia University Teachers C, 1982; Philosophiae Doctor, Univ of Wisconsin-Madison, 2000 (1998)


Stephen D. Dumont. Professor, Philosophy. Bachelor of Arts, Wabash College, 1974; Master of Arts, University of Toronto, 1976; Philosophiae Doctor, ibid., 1983 (2001)

Robert Matthew Dunn. Professor of the Practice, Electrical Engineering; Professor of the Practice. Bachelor of Science, University of Notre Dame, 1965; Master of Science, Pennsylvania State University, 1967; Philosophiae Doctor, Univ of IL Urbana-Champaign, 1971 (2008)


Amitava Krishna Dutt. Professor, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Presidency College, 1975; Master of Arts, University of Calcutta, 1977; Philosophiae Doctor, Massachusetts Institute of Tec, 1983 (1988)

Lawrence Henry Dwyer. Associate Teaching Professor, Music. Bachelor of Arts, University of Notre Dame, 1966; Master of Science, Univ of IL Urbana-Champaign, 1967 (2001)

Kenneth W. Dye. Professor, Music; Director, Band; Concurrent Professor, First Year of Studies. Bachelor of Music, Univ of Southern California, 1974; Master of Arts, California State U-Long Beach, 1980; Doctorate of Education, University of Houston, 1983; Master of Business Admin, ibid., 1985 (1998)

Matthew John Dyer. Professor, Mathematics; Associate Chair, Mathematics. Bachelor of Science, University of Sydney, 1983; Master of Science, ibid., 1985; Philosophiae Doctor, ibid., 1988 (1989)

Eva Dziadula. Associate Professor of the Practice, Department of Economics; Fellow, Kellogg Institute for International Studies. Associate in Arts, College of Lake County, 2004; Bachelor of Arts, Lake Forest College, 2006; Master of Arts, University of IL at Chicago, 2010; Philosophiae Doctor, ibid., 2014 (2014)

Robert Fumio Easley. Professor, IT, Analytics and Operations; John W. Berry Sr. Department Chair of IT, Analytics and Operations. Bachelor of Arts, Univ of IL Urbana-Champaign, 1976; Master of Business Admin, Pennsylvania State University, 1989; Philosophiae Doctor, Indiana Univ-Bloomington, 1996 (1994)


Kathleen M. Eberhard. Associate Professor, Psychology. Bachelor of Arts, University of Rochester, 1987; Master of Arts, Michigan State University, 1991; Philosophiae Doctor, ibid., 1993 (1996)

Josefina Echavarria Alvarez. Associate Professor of the Practice, Joan B. Kroc Inst for Int’l Peace Doctorate Degree, Universitat Jaume I, 2006 (2020)

Richard Masten Economakis. Professor, School of Architecture; Director of Graduate Studies for the Architecture and Urbanism Program, School of Architecture. Bachelor of Arch in Arch, Cornell University, 1983; Master of Architecture, ibid., 1995 (1996)

Nicholas Edelen. Assistant Professor, Mathematics. B.S. Mathematics, University of Edinburgh, 2012; Philosophiae Doctor, Stanford University, 2016 (2019)

Joshua Eisenman. Associate Professor of Global Affairs. Bachelor of Arts, George Washington Univ, 2000; Master of Arts, Johns Hopkins University, 2003; Doctor of Philosophy, Univ. of California-Los Angeles, 2014 (2019)

Lujing Ma Eisenman. Assistant Advising Professor and Assistant Dean for Academic Affairs, Keough School of Global Affairs; Concurrent Assistant Advising Professor, East Asian Languages and Cultures. Bachelor of Arts, Fudan University, 2001; Master of Arts, National University of Singapo, 2008; Doctor of Philosophy, Univ.of California-Los Angeles, 2016 (2019)

Brandon Scott Erlacher. Assistant Teaching Professor, IT, Analytics and Operations. Master of Business Admin, University of Notre Dame, 2005; Master of Business Admin, ibid., 2005; Master of Business Admin, ibid., 2005; Master of Business Admin, ibid., 2005; Master of Business Admin, ibid., 2005; Master of Science, ibid., 2016; M.S. Business Analytics, ibid., 2016; M.S. Business Analytics, ibid., 2016; M.S. Business Analytics, ibid., 2016 (2020)

Morton R. Eskildsen. Professor, Physics; Director, Physics. Bachelor of Science, University of Copenhagen, 1993; Master of Science, ibid., 1994; Philosophiae Doctor, ibid., 1998 (2003)

Robert Louis Essig. Associate Professor Specialistic, Marketing; Associate Teaching Professor. Bachelor of Science, Loyola University Chicago, 1970; Master of Arts, Northeastern Illinois Universi, 1972 (2016)

Manuel Alejandro Estefan Davila. Assistant Professor, Keough School of Global Affairs. Bachelor of Arts, Instituto Tecnologico Autonomo, 2012; Master of Public Affairs, University of Chicago, 2014; Philosophiae Doctor, University College London, 2019 (2019)

Nathan Eubank. Associate Professor, Theology. Bachelor of Arts, Malone College, 2001; Master of Theological Studies, Duke University, 2005; Philosophiae Doctor, ibid., 2012 (2018)

William N. Evans. Keough-Heuberg Professor of Economics; Professor, Department of Economics; Fellow, Institute for Real Estate. Bachelor of Arts, Wake Forest University, 1983; Master of Arts, Duke University, 1985; Philosophiae Doctor, ibid., 1987 (2007)


David Wilson Fagerberg. Professor, Theology. Bachelor of Arts, Augsburg College, 1973; Master of Divinity, Luther Theological Seminary, 1977; Master of Arts, St. John’s University, 1982; Master of Sacred Theology, Yale University-Div School, 1983; Master of Arts, Yale University, 1988; Master of Philosophy, ibid., 1988; Philosophiae Doctor, ibid., 1991 (2003)

Stephen Michael Fallon. Reverend John J. Cavanaugh, C.S.C. Professor of the Humanities (II); Joint Professor, English; Professor, Program of Liberal Studies. Bachelor of Arts, Princeton University, 1976; Master of Arts, McGill University, 1978; Philosophiae Doctor, University of Virginia, 1985 (1985)

Margot Fassler. Keough-Heuberg Professor of Music History and Liturgy; Professor, Theology; Director, Sacred Music @ ND; Fellow, Nanovic Institute for European Studies. Master of Arts, Syracuse University, 1978; Master of Philosophy, Cornell University, 1980; Philosophiae Doctor, ibid., 1983 (2010)

Ana Leticia Fauri. Assistant Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, Pontifical Cath Univ of Rio, 1998; Bachelor of Arts, ibid., 1998; Bachelor of Arts, ibid., 1998; Bachelor of Arts, ibid., 1998; Master of Arts, ibid., 2001; Master of Arts, ibid., 2001; Master of Arts, ibid., 2001; Master of Arts, ibid., 2001; Master of Arts, ibid., 2001; Philosophiae Doctor, ibid., 2006; Philosophiae Doctor, ibid., 2006; Philosophiae Doctor, ibid., 2006; Philosophiae Doctor, ibid., 2006; Philosophiae Doctor, ibid., 2006; Master of Arts, Brown University, 2010; Master of Arts, ibid., 2010; Master of Arts, ibid., 2010; Master of Arts, ibid., 2010; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016; Philosophiae Doctor, ibid., 2016 (2020)

Patrick John Fay. Professor, Electrical Engineering. Bach of Sc in Electrical Engr, University of Notre Dame, 1991; Master of Science, Univ of IL Urbana-Champaign, 1993; Philosophiae Doctor, ibid., 1996 (1997)

Jeffrey Lee Feder. Professor, Biological Sciences. Bachelor of Science, Pomona College, 1980; Philosophiae Doctor, Michigan State University, 1989 (1993)

Jeremy Ben Fein. Professor, Civil & Environmental Engineering & Earth Sciences; Director, Center for Environmental Science and Technology. Bachelor of Arts, University of Chicago, 1983; Master of Science, Northwestern University, 1986; Philosophiae Doctor, ibid., 1989 (1996)

Michael T. Ferdig. Professor, Biological Sciences. Bachelor of Science, Univ of Nebraska-Lincoln, 1987; Master of Science, ibid., 1990; Philosophiae Doctor, Univ of Wisconsin-Madison, 1997 (2001)

Maria Jose Fernandez Moreno. Assistant Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, Universidad Complutense de Mad, 1981; Master of Arts, ibid., 1985 (2016)

Felipe Fernandez-Armesto. William P. Reynolds Professor of History; Professor, History; Concurrent Professor, Classics. Bachelor of Arts, St John’s College Oxford, 1972; Master of Arts, ibid., 1976; Philosophiae Doctor, ibid., 1977 (2009)

A. Nilesh Fernando. Assistant Professor, Department of Economics; Concurrent Assistant Professor, Keough School of Global Affairs; Fellow, Kellogg Institute for International Studies; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Hampshire College, 2007; Philosophiae Doctor, Harvard University, 2015 (2016)

Harindra J. Fernando. Wayne & Diana Murdy Endowed Prof. in Engineering & Geo Sciences; Professor, Civil & Environmental Engineering & Earth Sciences; Concurrent Professor, Applied Computational Mathematics & Statistics; Concurrent Professor, Aerospace and Mechanical Engineering; Fellow, Institute for Real Estate. Bachelor of Science, The Open Univ of Sri Lanka, 1979; Master of Arts, Johns Hopkins University, 1982; Philosophiae Doctor, ibid., 1983 (2010)

Sabrina Ferri. Associate Professor, Romance Languages and Literatures; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University of Rome, 2000; Philosophiae Doctor, Stanford University, 2007 (2009)

Kenneth E. Filchak. Teaching Professor, Biological Sciences. Bachelor of Science, Michigan State University, 1994; Master of Science, Texas A I University, 1996; Philosophiae Doctor, University of Notre Dame, 2001 (2001)

John Mitchell Finnis. The Bioethics Family Chair in Law; Professor, Law School; Concurrent Professor, Philosophy. LLB - Law, University of Adelaide, 1961; Philosophiae Doctor, University College Oxford, 1965 (1995)

John Stockmann Firth. Assistant Professor, Department of Economics. Bachelor of Arts, University of Notre Dame, 2010; Philosophiae Doctor, Massachusetts Institute of Tec, 2018 (2019)

John T. Fitzgerald. Concurrent Professor, Classics; Professor, Theology. Bachelor of Arts, Auburn University, 1970; Master of Arts, Abilene Christian University A, 1972; Master of Divinity, Yale University-Div School, 1975; Master of Arts, Yale University, 1979; Master of Philosophy, ibid., 1981; Philosophiae Doctor, ibid., 1984 (2012)
David Gary Flagel. Assistant Professor of the Practice, UNDERC; Assistant Director, UNDERC; Concurrent Assistant Professor of the Practice, Biological Sciences. Bachelor of Science, Univ of Wisconsin-Oshkosh, 2008; Philosophiae Doctor, University of Notre Dame, 2015 (2015)

Mary Flannery. Teaching Professor, Department of Economics; Associate Dean, Dean's Off-Coll. of Arts & Letters; Associate Chair, Department of Economics; Economics, Director of Undergraduate Studies. Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, ibid., 1979; Philosophiae Doctor, University of Maryland, 1996 (2012)

Thomas Patrick Flint. Professor, Philosophy. Bachelor of Arts, Saint Ambrose College, 1975; Philosophiae Doctor, University of Notre Dame, 1980 (1982)

Ana Lidia Flores Mireles. Janet C. and Jeffrey A. Hawk Assistant Professor in Life Sciences; Assistant Professor, Biological Sciences. Bachelor of Science, University of Baja California, 2002; Doctor of Science, Cornell University, 2011 (2018)

Patrick Joseph Flynn. Duda Family Chair in Engineering; Professor, Computer Science and Engineering; Department Chair, Computer Science and Engineering; Concurrent Professor, Electrical Engineering. Bach of Sci in Electrical Engr, Michigan State University, 1985; Master of Science, ibid., 1986; Philosophiae Doctor, ibid., 1990 (2001)

Laura B. Flynn. Associate Advising Professor, Dean's Office, College of Science; Assistant Dean for First Year Advising, College of Science. Bachelor of Science, Saint Mary's College, 1979; Master of Business Admin, Indiana Univ South Bend, 1985 (2015)

Brian James Fogarty. Associate Professor of the practice, Center for Social Science Research; Concurrent Associate Professor of the Practice, Political Science; Director, Center for Social Science Research. Bachelor of Arts, SUNY College at Geneseo, 1999; Bachelor of Arts, ibid., 1999; Bachelor of Arts, ibid., 2001; Bachelor of Arts, ibid., 2001; Master of Arts, UNC at Chapel Hill, 2001; Philosophiae Doctor, ibid., 2005 (2019)

Theresa Maria Dunn Foley. Assistant Teaching Professor, Dean's Office-Call. of Engineering. Bachelor of Science, Univ of Wisconsin-Madison, 2002; Philosophiae Doctor, Pennsylvania State University, 2008; Master of Business Admin, Univ of Texas-Austin, 2013 (2013)

La Donna Lee Forsgren. Concurrent, Gender Studies; Assistant Professor, Film, Television, and Theatre. Bachelor of Arts, Western Oregon State College, 2002; Master of Arts, Brigham Young University, 2005; Philosophiae Doctor, Northwestern University, 2012 (2017)

Margaret Mary Forster. Teaching Professor, Finance. B.S. Industrial Engineering, University of Sao Paulo, 1982; Master of Business Admin, Cornell University, 1985; Master of Science, ibid., 1987; Doctor of Science, ibid., 1990 (2005)

Krista Marie Foster. Instructor, IT, Analytics and Operations. Bachelor of Arts, Youngstown State University, 2009; Bachelor of Science, ibid., 2009; Master of Science, Pennsylvania State University, 2011 (2019)

James Kieran Foster. CSC. Professor of the Practice, Preprofessional Studies; Assistant Dean, College of Science. Bachelor of Science, University of Notre Dame, 1977; Doctorate of Medicine, University of Illinois Medical, 1981; Master of Divinity, University of Notre Dame, 1994 (1997)

Judith L. Fox. Fellow, Institute for Real Estate; Clinical Professor, Clinical Law Center. Bachelor of Science, Wilkes College, 1985; Juris Doctor, University of Notre Dame, 1993 (1997)

Luis Ricardo Fraga. Arthur Foundation Professor in Transformative Latino Leadership; The Joseph and Elizabeth Robbie Professor of Political Science; Professor, Political Science; Director, Institute for Latino Studies. Bachelor of Arts, Harvard College, 1978; Master of Arts, Rice University, 1981; Philosophiae Doctor, ibid., 1984 (2014)

Leonardo Francalanci. Assistant Teaching Professor, Romance Languages and Literature; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Academia Europea di Firenze, 2005; Philosophiae Doctor, Universitat de Girona, 2014 (2013)

Mary Elizabeth Frandsen. Associate Professor, Music. Bachelor of Music, SUNY College at Potsdam, 1980; Master of Arts, University of Rochester, 1985; Philosophiae Doctor, ibid., 1997 (1997)


Malcolm J. Fraser. Rev. Julius A. Niewland, C.S.C., Professor of Biological Sciences; Professor, Biological Sciences. Bachelor of Science, Wellesley College, 1975; Master of Science, Ohio State University, 1979; Philosophiae Doctor, ibid., 1981 (1983)


Johanna Elizabeth Frymoyer. Assistant Professor, Music. Bachelor of Music, Vanderbilt University, 2004; Master of Fine Arts, Princeton University, 2006; Philosophiae Doctor, ibid., 2012 (2019)

Guosheng Fu. Assistant Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, Nankai University, 2011; Master of Science, University of Minnesota, 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Philosophiae Doctor, ibid., 2016 (2019)

Thomas E. Fuja. Professor, Electrical Engineering; Interim Dean, College of Engineering; Director, iNDurty Labs. Bachelor of Science, University of Michigan, 1981; Master of Engineering, Cornell University, 1983; Philosophiae Doctor, ibid., 1987 (1998)

Jacek K. Furdyna. Aurora and Thomas Marquez Professor of Information Theory and Computer Technology; Professor, Physics. Bachelor of Science, Loyola University Chicago, 1955; Philosophiae Doctor, Northwestern University, 1960 (1986)

Naoki Fuse. Assistant Teaching Professor, East Asian Languages and Cultures. Bachelor of Arts, University of Nihon, 2002; Master of Arts, ibid., 2004; Master of Arts, Portland State University, 2008 (2019)

Mary E. Galvin. Professor, Chemistry and Biochemistry. B.A. Chemistry, Manhattan College, 1973; Master of Science, Massachusetts Institute of Tec, 1982; Philosophiae Doctor, ibid., 1984 (2015)

David Galvin. Associate Professor, Mathematics. Bachelor of Mathematics, University of Cambridge, 1995; Philosophiae Doctor, Rutgers University, 2002 (2007)


Pengjie Gao. Professor, Finance; Fellow, Institute for Real Estate. Bachelor of Engineering, Qingdao University, 1998; Master of Science, University Tennessee Knoxville, 2002; Philosophiae Doctor, Northwestern University, 2007 (2007)
Haifeng Gao. Associate Professor, Chemistry and Biochemistry. Bachelor of Science, Fudan University, 2000; Master of Science, ibid., 2003; Philosophiae Doctor, Carnegie Mellon University, 2008 (2011)

Emily N. Garbinsky. Assistant Professor, Marketing. Bachelor of Science, Carnegie Mellon University, 2010; Philosophiae Doctor, Stanford University, 2015 (2015)

April Michelle Garcia. Assistant Teaching Professor, Inst for Educational Initiatives. Bachelor Degree - Unspecified, University of Notre Dame, 2005; Bachelor of Business Admin., ibid., 2005; Master Degree - Unspecified, ibid., 2007 (2015)

Anne Garcia-Romero. Associate Professor, Film, Television, and Theatre; Fellow, Institute for Latino Studies. Bachelor of Arts, Occidental College, 1987; Master of Fine Arts, Yale University, 1987; Master of Science, SUNY at Stony Brook, 1995; Philosophiae Doctor, Univ of California Sta Barbara, 2009 (2010)

Umesh Garg. Professor, Physics. Bachelor of Science, Birla Institute of Technology, 1972; Master of Science, ibid., 1974; Master of Science, SUNY at Stony Brook, 1975; Philosophiae Doctor, ibid., 1978 (1982)

Korey Gerard Garibaldi. Assistant Professor, American Studies. Bachelor of Arts, University of Minnesota, 2009; Master of Arts, University of Chicago, 2010; Philosophiae Doctor, ibid., 2016 (2016)

Peter M. Garnavich. Professor, Physics; Department Chair, Physics. Bachelor of Science, University of Maryland, 1980; Master of Science, Massachusetts Institute of Tec, 1983; Philosophiae Doctor, Univ of Washington, 1991 (2000)

Nicole S. Garnett. Professor, Law School; John P. Murphy Foundation Professor of Law; Fellow, Institute for Real Estate. Bachelor of Arts (Latin), Stanford University, 1992; Juris Doctor, Yale University, 1995 (1999)

Richard Garnett. Paul J. Schierl/For Howard Corporation Professor of Law; Professor, Law School; Concurrent Professor, Political Science. Bachelor of Arts, Duke University, 1990; Juris Doctor, Yale University, 1995 (1999)


David W. Gasperetti. Associate Professor, German and Russian Languages and Literature; Department Chair, German and Russian Languages and Literature. Bachelor of Arts, Lawrence University, 1976; Master of Arts, Univ.of California-Los Angeles, 1978; Philosophiae Doctor, ibid., 1985 (1989)


Anna Geltzer. Assistant Teaching Professor, Reilly Center - STV; Concurrent Assistant Teaching Professor, Sociology. Bachelor of Science, Brooklyn College, 1999; Master of Arts, New York University, 2004; Master of Arts, Cornell University, 2007; Philosophiae Doctor, ibid., 2012 (2016)

Frank Axel Germann. Associate Professor, Marketing. Bachelor of Arts, Reutlingen University, 2001; Master of Business Admin, University of Notre Dame, 2005; Master Degree - Unspecified, Pennsylvania State University, 2012; Philosophiae Doctor, Pennsylvania St University, 2012 (2012)


Lee Thomas Gettler. Associate Professor, Anthropology. Bachelor of Arts, University of Notre Dame, 2005; Philosophiae Doctor, Northwestern University, 2012 (2007)

J. Daniel Gezelter. Professor, Chemistry and Biochemistry; Associate Dean, Dean's Office-College of Science. Bachelor of Science, Duke University, 1989; Philosophiae Doctor, Univ of California Berkeley, 1995 (1999)

Nasir Ghiasieddin. Associate Professor, IT, Analytics and Operations. Bachelor of Science, Arya-Mehr Univ of Technology, 1970; Master of Science, Purdue University, 1975; Philosophiae Doctor, ibid., 1982 (1982)


Chloe Rae Gibbs. Assistant Professor, Department of Economics. Bachelor of Arts, University of Notre Dame, 2000; Master of Arts, University of Michigan, 2003; Master of Arts, University of Chicago, 2008; Philosophiae Doctor, ibid., 2012 (2015)

Bradley Stephen Gibson. Professor, Psychology. Bachelor of Science, Colorado State University, 1982; Philosophiae Doctor, University of Arizona, 1992 (1994)


Tiffany Rae Gillaspy. Assistant Librarian, Heuburgh Libraries. Bachelor of Music, Ohio University, 2010; Bachelor of Music, ibid., 2010; Bachelor of Music, ibid., 2010; Bachelor of Music, ibid., 2010; Master of Library & Info Sci, University of Iowa, 2016; Master of Library & Info Sci, ibid., 2016; Master of Library & Info Sci, ibid., 2016; Master of Library & Info Sci, ibid., 2016 (2016)

Nina Glibetic. Assistant Professor, Theology. Bachelor of Arts, McGill University, 2003; Bachelor of Sacred Theology, Universitate a St. Thomas Aqui, 2004; Licentiate in Sacred Theology, ibid., 2007; Philosophiae Doctor, Oriental Institute, 2013 (2018)

Donna Marie Glowacki. Associate Professor, Anthropology. Bachelor of Arts, Miami University, 1992; Master of Arts, Univ of Missouri-Columbia, 1995; Philosophiae Doctor, Arizona State University, 2006 (2007)

David Batten Go. Rooney Family Associate Professor of Engineering, Aerospace and Mechanical Engineering; Professor, Aerospace and Mechanical Engineering. Bachelor of Science, University of Notre Dame, 2001; Master of Science, University of Cincinnati, 2004; Philosophiae Doctor, Purdue University, 2008 (2008)

Joachim Goerres. Research Professor, Physics. Bachelor of Science, University of Munster, 1974; Philosophiae Doctor, ibid., 1983 (1987)
Gary Goertz. Professor, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Bethel University, 1976; Master of Science, University of Iowa, 1982; Philosophiae Doctor, University of Michigan, 1988 (2012)

Benjamin Golez. Associate Professor, Finance. Bachelor of Science, University of Ljubljana, 2005; Master of Science, Universitat Pompeu Fabra, 2006; Philosophiae Doctor, ibid., 2011 (2011)

Mark Louis Golitko. Assistant Professor, Anthropology. Bachelor of Science, University of Wisconsin Center, 1999; Master of Arts, Univ of Illinois-Chicago, 2002; Philosophiae Doctor, ibid., 2010 (2017)

Dawn M. Gondoli. Professor, Psychology; William J. Shaw Center for Children and Families College Professor. Bachelor of Arts, State Univ of NY-Buffalo, 1986; Master of Science, University of Arizona, 1991; Philosophiae Doctor, ibid., 1994 (1994)

DeeAnne M. Goodenough-Lashua. Teaching Professor, Chemistry and Biochemistry; Associate Teaching Professor. Bachelor of Science, Valparaiso University, 1994; Philosophiae Doctor, University of Michigan, 2001 (2001)

Victoria Elizabeth Goodrich. Associate Teaching Professor, Chemical and Biomolecular Engr; Associate Professor of the Practice. Bach of Sci in Chemical Engr, Univ of Okhlahoma-Norman, 2006; Master of Science, University of Notre Dame, 2009; Philosophiae Doctor, ibid., 2011 (2013)

Holly V. Goodson. Professor, Chemistry and Biochemistry; Concurrent Professor, Biological Sciences; Director, Integrated Biomedical Sciences. Bachelor of Arts (Latin), Princeton University, 1988; Philosophiae Doctor, Stanford University, 1995 (2000)


Johannes Goransson. Associate Professor, English. Bachelor of Arts, Univ of Minnesota of Minneapolis, 1996; Bachelor of Arts, University of Iowa, 1996; Master of Fine Arts, University of Georgia, 2008 (2007)


Andrew Cleveland Gould. Associate Professor, Political Science; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Bachelor of Arts (Latin), Harvard University, 1985; Master of Arts, Univ of California Berkeley, 1986; Philosophiae Doctor, ibid., 1992 (1993)

Robert D. Goulding. Associate Professor, Program of Liberal Studies; Concurrent Associate Professor, History; Director, Reilly Center for Science, Technology, and Value

Director, History, Philosophy, and Science Program. Bachelor of Science, University of Canterbury, 1989; Bachelor of Arts, ibid., 1990; Master of Arts, The Warburg Institute, 1992; Philosophiae Doctor, ibid., 1999 (2003)

Daniel A. Graff. Professor of the Practice, Center for Social Concerns; Joint Appointment Professor of the Practice, History. Bachelor of Arts, Univ of IL Urbana-Champaign, 1990; Master of Arts, Univ of Wisconsin-Madison, 1993; Philosophiae Doctor, ibid., 2004 (2001)

Karen Graubart. Concurrent Associate Professor, Gender Studies; Concurrent Associate Professor, Romance Languages and Literatures; Fellow, Kellogg Institute for International Studies; Associate Professor, History. Bachelor of Arts, Barnard College, 1984; Philosophiae Doctor, Univ of Massachusetts, 2000 (2007)

Richard L. Gray. Associate Professor, Art, Art History, and Design; Department Chair, Art, Art History, and Design. Bachelor of Science, Illinois State University, 1976; Master of Fine Arts, Rochester Inst of Technology, 1982 (1982)

Barbara Jean Green. Concurrent Professor, Gender Studies; Professor, English. Philosophiae Doctor, University of Virginia, 1991 (1991)

Brad S. Gregory. Professor, History; Dorothy G. Griffin College Professor; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Universite Catholique De Louva, 1984; Bachelor of Science, Utah State University, 1985; Master of Arts, Catholic University of Louvain, 1987; Master of Arts, University of Arizona, 1989; Philosophiae Doctor, Princeton University, 1996 (2003)

Thomas A. Gresik. Professor, Department of Economics; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Northwestern University, 1981; Master of Science, California Institute of Techno, 1982; Philosophiae Doctor, Northwestern University, 1987 (2000)

John Paul Grieco. Associate Research Professor, Biological Sciences. Bachelor of Science, University of Notre Dame, 1990; Master of Science, Texas A&M University, 1994; Philosophiae Doctor, Uniformed Services Health Sci., 2001 (2014)


Patrick N. Griffin. Professor, History; Madden-Hennebry Family Professor of Irish-American Studies; Concurrent Professor, American Studies; Concurrent Professor, Law School; Director, Keough-Naughton Institute for Irish Studies; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 1987; Master of Arts, Columbia University, 1991; Philosophiae Doctor, Northwestern University, 1999 (2008)

David Alexander Griffith. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, University of Notre Dame, 1998; Master of Fine Arts, ibid., 2001; Master of Fine Arts, University of Pittsburgh, 2001 (2019)

Luca Grillo. Department Chair, Classics; Associate Professor, Classics. Bachelor of Arts, Università Cattolica del Sac, 1995; Master of Arts, University of Minnesota, 2003; Philosophiae Doctor, Princeton University, 2008 (2018)

Jennifer Helen Grillo. Assistant Professor, Theology, Tisch Family Assistant Professor of Theology. Bachelor of Arts, University of Oxford, 1994; Master Degree - Unspecified, ibid., 2006; Philosophiae Doctor, ibid., 2010 (2018)

Daniel Gerard Groody, CSC. Associate Professor, Theology; Vice President and Associate Provost; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University of Notre Dame, 1986; Master of Divinity, Jesuit School of Theology, 1992; Philosophiae Doctor, Graduate Theological Union, 2000; Licentiate in Sacred Theology, Jesuit School of Theology, 2001 (2000)
Kevin Gregory Grove, CSC. Assistant Professor, Theology. Master of Arts, University of Toronto, 2003; Bachelor of Arts, Seattle University, 2004; Master of Divinity, University of Notre Dame, 2009; Philosophiae Doctor, University of Cambridge, 2015 (2015)


Li Guo. Professor, Classics. Bachelor of Arts, Shanghai International Studies, 1979; Philosophiae Doctor, Yale University, 1994 (1999)

Ruilan Guo. Associate Professor, Chemical and Biomolecular Engineering. Bachelor of Engineering, Beijing University of Tech., 1998; Master of Engineering, ibid., 2001; Philosophiae Doctor, Georgia Institute of Technolog, 2008 (2012)

Hong Guo. Associate Professor, IT, Analytics, and Operations. Bachelor of Engineering, Renmin University Beijing, 1999; Master of Engineering, ibid., 2002; Master of Science, University of Rochester, 2005; Philosophiae Doctor, University of Florida, 2009 (2009)


David Turco Gura. Concurrent Assistant Professor, Medieval Institute; Associate Librarian, Hesburgh Libraries; Concurrent Associate Librarian, Classics. Bachelor of Arts, Ohio State University, 2003; Master of Arts, ibid., 2005; Philosophiae Doctor, ibid., 2010 (2010)

Perin Gurel. Concurrent, Gender Studies; Assistant Professor, American Studies; Fellow, Nanovic Institute for European Studies; Director of Undergraduate Studies. Bachelor of Arts, Univ of California Berkeley, 2004; Master of Arts, Yale University, 2007; Master of Philosophy, ibid., 2008; Philosophiae Doctor, ibid., 2010 (2013)


Susan Kay Gursky. Assistant Teaching Professor, Preprofessional Studies. Bachelor of Science, University of Michigan, 1985; Master of Science, Univ of Southern California, 1991; Philosophiae Doctor, University of Chicago, 1998 (2009)

Jimmy Gurule. Professor, Law School; Concurrent Professor, Political Science. Bachelor of Arts, University of Utah, 1974; Juris Doctor, ibid., 1980 (1989)

Sandra Marie Gustafson. Professor, English; Concurrent Professor, American Studies. Bachelor of Arts, Cornell University, 1985; Philosophiae Doctor, Univ of California Berkeley, 1993 (1993)

Gregory Paul Haake, CSC. Fellow, Kellogg Institute for International Studies; Assistant Professor, Romance Languages and Literatures; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University of Notre Dame, 1999; Master of Divinity, ibid., 2006; Master of Arts, Middlebury College, 2009; Philosophiae Doctor, Stanford University, 2015 (2015)

Eric James Haanstad, Jr.. Associate Professor of the Practice, Anthropology. Bachelor of Arts, University of Minnesota, 1996; Master of Arts, University of Wisconsin Center, 2001; Philosophiae Doctor, ibid., 2008 (2015)

David S. Hachen. Associate Professor, Sociology. Bachelor of Arts, Lake Forest College, 1974; Master of Arts, Univ of Wisconsin-Madison, 1978; Philosophiae Doctor, ibid., 1983 (1987)

Gerald Haefeli. Associate Professor, Psychology. Bachelor of Arts (Latin), Lawrence University, 1997; Philosophiae Doctor, Univ of Wisconsin-Madison, 2005 (2006)

Martin Haenggi. The Frank M. Freimann Chair in Electrical Engineering III; Professor, Electrical Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics. Master of Science, Swiss Federal Inst Technol, 1995; Philosophiae Doctor, ibid., 1999 (2001)

Azeb Haileselassie. Assistant Teaching Professor, Romance Languages and Literatures. Associate in Arts, University Paul Valery, 1992; Bachelor of Arts, University of Toulouse II, 1994; Master of Arts, ibid., 1998; Master of Arts, Indiana Univ-Bloomington, 2008; Philosophiae Doctor, Univ of IL Urbana-Champaign, 2015 (2016)

Kasturi Haldar. The Rev. Julius A. Nieuwland, C.S.C., Professor of Biological Sciences; Professor, Biological Sciences. Bachelor of Arts, Bryn Mawr College, 1978; Philosophiae Doctor, Massachusetts Institute of Tec, 1982 (2008)

Matthew Eric Kane Hall. Concurrent, Law School; Professor, Political Science. Bachelor of Science, Northwestern Univ.- Chicago, 2005; Master of Arts, Yale University, 2007; Master of Philosophy, ibid., 2008; Philosophiae Doctor, ibid., 2009 (2013)

Douglas Carleton Hall. Associate Professor, Electrical Engineering. Bachelor of Science, Miami University, 1985; Master of Science, Univ of IL Urbana-Champaign, 1988; Philosophiae Doctor, ibid., 1991 (1994)

Brittany Solomon Hall. Assistant Professor, Management & Organization. Bachelor of Arts, University of Arizona, 2007; Master of Arts, Washington University, 2012; Philosophiae Doctor, ibid., 2015 (2015)

Brian C. Hall. Professor, Mathematics. B.S. Engineering Physics, ibid., 1988; Bachelor of Arts, Cornell University, 1988; Philosophiae Doctor, ibid., 1993 (1999)


Jennifer Lynn Hames. Assistant Clinical Professor, Psychology. Bachelor of Arts, University of Notre Dame, 2009; Master of Science, Florida State University, 2011; Philosophiae Doctor, ibid., 2015 (2016)

Alan Hamlet. Concurrent Associate Professor, Biological Sciences; Associate Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Arts, University of Rochester, 1981; Bachelor of Science, Univ of Washington, 1992; M.S. Engineering, ibid., 1996; Philosophiae Doctor, ibid., 2006 (2013)

Christopher Stone Hamlin. Professor, History. Bachelor of Arts, Antioch University, 1974; Master of Arts, Univ of Wisconsin-Madison, 1977; Philosophiae Doctor, ibid., 1982 (1985)

Darlene R Hampton. Associate Advising Professor; Concurrent Associate Advising Professor, Film, Television, and Theatre. Bachelor of Arts, Univ of Oregon, 1999; Master of Arts, ibid., 2006; Philosophiae Doctor, ibid., 2010 (2012)

Qing Han. Professor, Mathematics. Bachelor of Science, Beijing University, 1986; Master of Science, New York University, 1991; Philosophiae Doctor, ibid., 1993 (1994)

Noriro Hanabusua. Professor of the Practice, East Asian Languages and Cultures; Coordinator, Japanese Program. Bachelor of Arts, Keio University, 1988; Master of Arts, Univ of Wisconsin-Madison, 1994 (1994)

Donny Hanjaya Putra. Assistant Professor, Aerospace and Mechanical Engineering. Bach of Sci in Chemical Engr, University of Notre Dame, 2007; Philosophiae Doctor, Johns Hopkins University, 2012 (2017)

Jeffrey Joseph Harden. Concurrent Assistant Professor, Applied and Computational Mathematics and Statistics; Associate Professor, Political Science. Bachelor of Arts, Univ of IL Urbana-Champaign, 2007; Master of Arts, UNC at Chapel Hill, 2009; Philosophiae Doctor, ibid., 2012 (2016)

Chad Harms. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Iowa State University, 1995; Master of Arts, Michigan State University, 2000; Philosophiae Doctor, ibid., 2004 (2010)

Susan Cannon Harris. Concurrent Professor, Gender Studies; Professor, English. Bachelor of Arts, Yale University, 1991; Master of Arts, UNC at Chapel Hill, 1993; Philosophiae Doctor, Univ of Texas-Austin, 1998 (1998)


Gregory Victor Hartland. Professor, Chemistry and Biochemistry; Director of Graduate Studies. Bachelor of Science, University of Melbourne, 1985; Philosophiae Doctor, Univ.of California-Los Angeles, 1991 (1994)

Jonathan David Hauenstein. Associate Chair, Applied Computational Mathematics & Statistics; Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, The Univ of Findlay, 2003; M.S. Mathematics, Miami University, 2005; Philosophiae Doctor, University of Notre Dame, 2009 (2009)

Marius Bratsberg Hauknes. Assistant Professor, Art, Art History, and Design. Bachelor of Arts, University of Oslo, 2004; Master of Arts, ibid., 2006; Master of Arts, Princeton University, 2010; Philosophiae Doctor, ibid., 2014 (2017)

Mandy Lynn Haven. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, Ball State University, 1996; Master of Library & Info Sci, Indiana-Purdue Univ Indpls, 2007 (2008)

Matthew Alan Hawkins. Assistant Professor of the Practice, Film, Television, and Theatre. Philosophiae Doctor, University of Iowa, 2012; Bachelor of Fine Arts, Southern Methodist University, (2017)


Barbara J. Hellenthal. Associate Professor of the Practice, Biological Sciences; Curator of Museum of Biodiversity & Greene-Nieuwland Herbarium. Bachelor of Science, University of Minnesota, 1974 (1980)

Ben A. Heller. Associate Professor, Romance Languages and Literatures; Romance Languages and Literatures, Spanish, Director of Undergraduate Studies. Bachelor of Arts, Univ of Pennsylvania, 1981; Master of Arts, ibid., 1990; Philosophiae Doctor, Washington University, 1990 (2000)

Paul Helquist. Professor, Chemistry and Biochemistry; Associate Chair for Research, Chemistry and Biochemistry. Bachelor of Arts, University of Minnesota at Dul, 1969; Master of Science, Cornell University, 1971; Philosophiae Doctor, ibid., 1972 (1984)

Daniel Henriques Moreira. Assistant Research Professor, Computer Science and Engineering. Bachelor of Science, Federal University of Para, 2005; Bachelor of Science, ibid., 2005; Master of Science, Fed Univ of Pernambuco Recife, 2008; Master of Science, Federal University of Paraíba, 2008; Philosophiae Doctor, University of Campinas, 2016; Philosophiae Doctor, ibid., 2016 (2016)

David Ray Hernandez. Associate Professor, Classics; Concurrent Associate Professor, Anthropology. Bachelor of Arts, Univ of California Berkeley, 1996; Master of Arts, University of Cincinnati, 2004; Philosophiae Doctor, ibid., 2010 (2009)

Jason C. Hicks. Associate Professor, Chemical and Biomolecular Engineering; Tony and Sarah Earley Associate Professor of Energy and the Environment. Bachelor of Science, Kentucky Wesleyan College, 2001; Bachelor of Engineering, Vanderbilt University, 2003; Philosophiae Doctor, Georgia Institute of Technolog, 2007 (2010)

Katrina Michelle Higgins. Associate Advising Professor, Center for University Advising; Director of First Year Advising and Academic Initiatives, . Bachelor of Arts, James Cook University, 1993; Master of Arts, Australian National University, 1995; Philosophiae Doctor, University of Tasmania, 2006 (2019)

Michael Douglas Hildreth. Professor, Physics; Associate Dean for Research and Graduate Studies, College of Science. Bachelor of Arts (Latin), Princeton University, 1988; Philosophiae Doctor, Stanford University, 1995 (2000)

M. Catherine Hilkert, OP. Professor, Theology. Bachelor of Arts, University of Dayton, 1971; Master of Arts, Catholic University of America, 1979; Philosophiae Doctor, ibid., 1984 (1995)

Davide A. Hill. Associate Professor, Chemical and Biomolecular Engineering, M.S. Chemical Engineering, University of Naples, 1983; Philosophiae Doctor, Univ of California Berkeley, 1989 (1990)

Tyvette S Hilliard. Research Assistant Professor, Chemistry and Biochemistry. Bachelor of Science, Chicago State University, 2007; Bachelor of Science, ibid., 2007; Bachelor of Science, ibid., 2007; Bachelor of Science, ibid., 2007; Philosophiae Doctor, Univ of Illinois-Chicago, 2012 (2015)

Richard K. Hind. Professor, Mathematics; Department Chair, Mathematics. Bachelor of Arts, University of Cambridge, 1993; Philosophiae Doctor, Stanford University, 1997 (2000)

Christopher Hinkle. Leonard C. Bettes Professor of Electrical Engineering; Associate Professor, Electrical Engineering. Bachelor of Physics, North Carolina Central Unvirs, 1999; Philosophiae Doctor, North Carolina State University, 2005 (2018)

Amy E. Dixon. Assistant Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, Radford University, 2006; Master of Science, Clemson University, 2008; Philosophiae Doctor, ibid., 2013 (2013)

Daniel Bruce Hobbs. Associate Professor, History. Bachelor of Science, Pensacola Christian College, 1989; Master of Arts, Bowling Green State University, 1995; Master of Medieval Studies, University of Notre Dame, 1997; Philosophiae Doctor, ibid., 2002 (2012)

Bertrand M. Hochwald. Professor, Electrical Engineering; Frank M. Freimann Professor of Electrical Engineering. Bachelor of Science, Swarthmore College, 1984; Master of Science, Duke University, 1986; Master of Arts, Yale University, 1993; Philosophiae Doctor, ibid., 1995 (2011)
Michael Hockx. Professor, East Asian Languages and Cultures; Director, Liu Institute for Asia & Asian Studies; Fellow, Kellogg Institute for International Studies. Master Degree - Unspecified, Universiteit Leiden, 1987; Philosophiae Doctor, ibid., 1994 (2016)

Matthews Manfred Hoelzel. Instructor, Department of Economics. Diploma, Karlsruhe Inst. of Technology, 2010 (2020)

Michael Thomas Hoffman. Fellow, Kellogg Institute for International Studies; Assistant Professor, Political Science. Bachelor of Arts, University of Notre Dame, 2010; Master of Arts, Princeton University, 2012; Philosophiae Doctor, ibid., 2016 (2016)

Anthony James Hoffman. Associate Professor, Electrical Engineering. Bachelor of Science, Univ of Maryland Baltimore Cou, 2004; M.S. Engineering, Princeton University, 2006; Philosophiae Doctor, ibid., 2009 (2012)

Peter D. Holland. McMeel Professor of Shakespeare Studies; Professor, Film, Television, and Theatre; Concurrent Professor, English; Associate Dean, College of Arts and Letters. Bachelor of Arts, Trinity Hall Cambridge, 1972; Philosophiae Doctor, ibid., 1977; Philosophiae Doctor, ibid., 1977 (2002)


Peter Andrew Hook. Associate Librarian, Library Laws. Bachelor of Arts, University of Kansas, 1994; Juris Doctor, ibid., 1997; Master of Library & Info Sci, Univ of IL Urbana-Champaign, 2000; Philosophiae Doctor, Indiana Univ-Bloomington, 2014 (2020)

David Anderson Hooker. Associate Professor of the Practice, Joan B. Kroc Inst. for Int’l Peace. B.S. Biology, Morehouse College, 1981; Master of Arts, Washington University, 1983; Master of Public Administration, ibid., 1987; Master of Public Health, University of Massachusetts Bo, 1987; Juris Doctor, Emory University, 1994; Master of Divinity, ibid., 2004; Philosophiae Doctor, Tilburg University, 2014 (2016)

Vittorio G. Hosle. Paul G. Kimball Professor of Arts and Letters; Professor, German and Russian Languages and Literature; Concurrent Professor, Philosophy. Philosophiae Doctor, Eberhard Karl Univ of Tübingen, 1982 (1999)

Erika Rene Hosselkus. Assistant Librarian, Hesburgh Libraries. Bachelor of Arts, University of Nevada-Reno, 2003; Master of Arts, Tulane University, 2005; Philosophiae Doctor, ibid., 2016 (2016)

Don A. Howard. Professor, Philosophy. Bachelor of Science, Michigan State University, 1971; Master of Arts, Boston University, 1973; Philosophiae Doctor, ibid., 1979 (1997)

Scott Sheridan Howard. Associate Professor, Electrical Engineering. Bachelor of Science, University of Notre Dame, 2003; Philosophiae Doctor, Princeton University, 2008 (2011)


Yi-Ting Hsu. Assistant Professor, Physics. B.S. Physics, National Tsing Hua University, 2009; Philosophiae Doctor, Cornell University, 2017 (2020)

Xiaobo Hu. Professor, Computer Science and Engineering; Concurrent Professor, Electrical Engineering. Bachelor of Science, Tianjin University, 1982; Master of Science, Polytechnic Institute of New Y, 1984; Philosophiae Doctor, Purdue University, 1989 (1996)

Bei Hu. Department Chair, Applied Computational Mathematics & Statistics; Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, East China Normal University, 1982; Master of Science, ibid., 1984; Master of Science, University of Minnesota, 1989; Philosophiae Doctor, ibid., 1990 (1990)

Jane Huang. Professor, Computer Science and Engineering. Bachelor of Science in Computer Sci, Governors State University, 1996; Master of Engineering, ibid., 1998; Philosophiae Doctor, University of IL at Chicago, 2002 (2016)

Yih-Fang Huang. Professor, Electrical Engineering; Senior Associate Dean for Education and Undergraduate Programs, College of Engineering. Bach of Sci in Electrical Engr, National Taiwan University, 1976; Master of Science, University of Notre Dame, 1979; Philosophiae Doctor, Princeton University, 1982 (1982)

Roger D. Huang. Kenneth R. Meyer Professor of Global Investment Management; Professor, Finance. Bachelor of Science, Purdue University, 1975; Master of Arts, Univ of Pennsylvania, 1978; Philosophiae Doctor, ibid., 1980 (2000)

Timothy David Hubbard. Assistant Professor, Management & Organization; Donnelly Fellow in Participatory Management. Bach of Sci in Mech Engr, Univ of IL Urbana-Champaign, 2005; Doctor of Philosophy, University of Georgia, 2017 (2017)

Bruce Robert Huber. Professor, Law School; Fellow, Institute for Real Estate. Bachelor of Arts, Stanford University, 1996; Juris Doctor, Univ of California Berkeley, 2000; Master of Arts, ibid., 2006; Philosophiae Doctor, ibid., 2010 (2011)

Paul W. Huber. Professor, Chemistry and Biochemistry. Bachelor of Science, Boston College, 1973; Philosophiae Doctor, Purdue University, 1978 (1985)

Alan Huebner. Teaching Professor, Applied Computational Math & Stats. Bachelor of Arts, Concordia University, 2001; Master of Science, DePaul University, 2003; Philosophiae Doctor, Univ of IL Urbana-Champaign, 2008 (2011)


Christian Hughes. Assistant Professor, Marketing. Bachelor of Science, University of Pittsburgh, 2012; Master of Arts, ibid., 2013; Philosophiae Doctor, ibid., 2019 (2019)


Victoria Tin-bor Hui. Associate Professor, Political Science. Bachelor of Social Science, Chinese University of Hong Kong, 1990; Master of Arts, Columbia University, 1995; Master of Philosophy, ibid., 1997; Philosophiae Doctor, ibid., 2000 (2004)
Faculty


Edward Francis Hum. Teaching Professor, Accountancy. Bachelor of Business Admin., University of Notre Dame, 1975; Master of Science, Indiana Univ South Bend, 1979; Master of Business Admin, ibid., 1989 (1975)

Daniel Michael Hungerman. Professor, Department of Economics; Economics, Director of Graduate Studies. Bachelor of Arts, Miami University, 2000; Philosophiae Doctor, Duke University, 2005 (2005)


Jennifer A. Huynh. Assistant Professor, American Studies. Bachelor of Arts, Univ of California Berkeley, 2003; Master of Arts, University of Bristol, 2007; Master of Arts, Princeton University, 2010; Philosophiae Doctor, ibid., 2016 (2018)

Huy Huynh. Associate Teaching Professor; Associate Teaching Professor, IT, Analytics and Operations. Associate in Science, Georgia State University, 2004; Associate in Science, ibid., 2004; Associate in Science, ibid., 2004; Associate in Science, ibid., 2004; Associate in Science, Georgia Perimeter College, 2004; Bachelor of Science, Kennesaw State University, 2006; Bachelor of Science, ibid., 2006; Bachelor of Science, ibid., 2006; Bachelor of Science, ibid., 2006; Bachelor of Science, Georgia Institute of Technolog, 2009; Master of Science, ibid., 2009; Master of Science, ibid., 2009; Master of Science, ibid., 2009; Master of Science, ibid., 2009; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012; Philosophiae Doctor, ibid., 2012

David R. Hyde. The Rev. Howard J. Kenna, C.S.C., Memorial Director of the Zebrafish Research Center, Center for Zebrafish Research; Professor, Biological Sciences; Director, Center for Zebrafish Research. Bachelor of Science, Michigan State University, 1980; Philosophiae Doctor, Pennsylvania State University, 1985 (1988)

Vlad Mihai Iluc. Associate Professor, Chemistry and Biochemistry. Bachelor of Science, Univ. of Politehnica-Bucharest, 2000; Master of Science, Univ of Illinois-Chicago, 2003; Philosophiae Doctor, ibid., 2009 (2011)

Andrew John Imdieke. Assistant Professor, Accountancy. Bachelor of Arts, Hope College, 2003; Master of Business Admin, Michigan State University, 2011; Philosophiae Doctor, ibid., 2016 (2016)

Lakshmi Iyer. Associate Professor, Department of Economics; Fellow, Kellogg Institute for International Studies; Fellow, Institute for Real Estate. Bachelor Degree - Unspecified, Indian Statistical Institute, 1995; Master Degree - Unspecified, ibid., 1997; Philosophiae Doctor, Massachusetts Institute of Tec, 2003 (2016)

Ross Colin Jacobucci. Assistant Professor, Psychology. Bachelor of Arts, Luther College, 2010; Master of Arts, University of Northern Iowa, 2013; Master of Arts, Univ of Southern California, 2015; Philosophiae Doctor, ibid., 2017 (2017)

Mallory Diane Jagodzinski. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, Michigan State University, 2008; Master of Arts, Bowling Green State University, 2010; Doctor of Philosophy, ibid., 2015 (2018)

Monica Nicole Jancha. Associate Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, University of Notre Dame, 2006; Master of Arts, ibid., 2007 (2010)


Ireneusz Janik. Research Assistant Professor, Radiation Laboratory. Master of Science, University of Lodz, 1995; Philosophiae Doctor, Technical University of Lodz, 2001 (2004)


Kyle Jaros. Associate Professor, Keough School of Global Affairs. Bachelor of Arts, Princeton University, 2005; Master of Arts, Harvard University, 2010; Doctor of Philosophy, ibid., 2014 (2020)

Katie Lynn Jarvis. Fellow, Nanovic Institute for European Studies; Associate Professor, History. Bachelor of Arts, Boston College, 2007; Doctor of Philosophy, Univ of Wisconsin-Madison, 2014 (2016)

Carlos Alberto Jauregui. Associate Professor, Romance Languages and Literatures; Concurrent Associate Professor, Anthropology; Fellow, Kellogg Institute for International Studies. Bachelor of Laws, National University of Colombi, 1993; Master of Arts, West Virginia University, 1997; Philosophiae Doctor, University of Pittsburgh, 2001; Certificate Program, ibid., (2011)

Debra Javeline. Associate Professor, Political Science. Bachelor of Arts (Latin), Brown University, 1989; Philosophiae Doctor, Harvard University, 1997 (2004)

Alexander Jech. Associate Professor of the Practice, Philosophy. Bachelor of Arts, Univ of Washington, 2002; Master of Arts, University of Notre Dame, 2007; Philosophiae Doctor, ibid., 2009 (2014)

Peter Grant Jeffery. Michael P Grace Professor of Medieval Studies; Interim Department Chair, Music; Professor, Music; Concurrent Professor, Anthropology; Fellow, Nanovic Institute for European Studies; Concurrent Professor, Theology; Director of Graduate Studies, Sacred Music. Bachelor of Arts, Brooklyn College, 1975; Philosophiae Doctor, Princeton University, 1980 (2009)


John Ignatius Jenkins, CSC. President; Professor, Philosophy. Bachelor of Arts, University of Notre Dame, 1976; Master of Arts, ibid., 1978; Bachelor of Philosophy, University of Oxford, 1987; Licentiate in Sacred Theology, Jesuit School of Theology, 1988; Master of Divinity, ibid., 1988; Philosophiae Doctor, University of Oxford, 1989 (1990)

Lionel M. Jensen. Associate Professor, East Asian Languages and Cultures; Concurrent Associate Professor, History. Bachelor of Arts, Williams College, 1976; Master of Arts, Washington University, 1980; Philosophiae Doctor, Univ of California Berkeley, 1992 (2000)
Robin Jensen. Patrick O’Brien Professor of Theology; Professor, Theology; Concurrent Professor, Art, Art History, and Design; Concurrent Professor, Classics; Director, MTS Program, Theology. Bachelor of Arts, Concordia College at Moorhead, 1973; Master of Arts, Columbia University, 1977; Philosophiae Doctor, ibid., 1986 (2015)

Michael James Jenuwine. Clinical Professor, Clinical Law Center. Bachelor of Science, University of Michigan, 1988; Master of Arts, University of Chicago, 1990; Juris Doctor, Loyola University Chicago, 2000 (2005)


Meng Jiang. Assistant Professor, Computer Science and Engineering. Bachelor of Engineering, Tsinghua University, 2010; Philosophiae Doctor, ibid., 2015 (2017)


Daniel Jonas Johnson. Assistant Librarian, Hesburgh Libraries. Bachelor Degree - Unspecified, Bethany Lutheran College Inc, 2006; Bachelor of Arts, ibid., 2006; Master Degree - Unspecified, Wake Forest University, 2008 (2015)

Robert Christopher Johnson. Associate Professor, Department of Economics; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Northwestern University, 2000; Master of Science, London School of Econ & Pol Sc, 2003; Philosophiae Doctor, Univ of California Berkeley, 2008 (2018)

Ian Ona Johnson. P. J. Monan Family Assistant Professor of Military History; Assistant Professor, History. Bachelor of Arts, Claremont McKenna College, 2009; Master of Arts, Ohio State University, 2010; Philosophiae Doctor, ibid., 2016 (2019)

Maxwell (Rev.) Edwin Johnson. Professor, Theology. Bachelor of Arts, Augustana College, 1974; Master of Divinity, Wartburg Theological Seminary, 1978; Master of Arts, Saint John’s University, 1982; Master of Arts, University of Notre Dame, 1989; Philosophiae Doctor, ibid., 1992 (1997)

Cyraina Evelene Johnson-Roullier. Associate Professor, English; Concurrent Associate Professor, Gender Studies. Bachelor of Science, Ohio University, 1982; Master of Arts, Ohio State University, 1985; Master of Arts, State Univ of NY at Albany, 1990; Philosophiae Doctor, State Univ of NY-Buffalo, 1992 (1991)


Richard Gordon Jones. Associate Teaching Professor, American Studies. Bachelor of Arts, University of Delaware, 1993; Master of Science, Columbia University, 2009 (2017)

Claire Taylor Jones. Associate Professor, German and Russian Languages and Literature; William Payden Associate Professor. Bachelor of Arts, Mount Holyoke College, 2005; Master of Arts, Dartmouth College, 2006; Master of Arts, Univ of Pennsylvania, 2008; Philosophiae Doctor, ibid., 2012 (2012)

Robert Louis Jones. Associate Dean for Experiential Programs, Law School; Clinical Professor, Dean’s Office-Law School. Bachelor of Arts, University of Notre Dame, 1980; Juris Doctor, Harvard University, 1984 (2002)

Colin Ross Jones. Associate Teaching Professor, Finance; Associate Teaching Professor. Bachelor of Business Admin., New Mexico State University, 2002; Master of Business Admin, Coll of William & Mary, 2006; Philosophiae Doctor, Pennsylvania State University, 2013 (2019)

Stuart Jones. Associate Professor, Biological Sciences. Bachelor of Science, University of Wisconsin Center, 2003; Philosophiae Doctor, ibid., 2008 (2010)


Andrei Jorza. Associate Professor of the Practice, Mathematics. Bachelor of Arts, Harvard University, 2005; Philosophiae Doctor, Princeton University, 2010 (2013)

Siddharth Joshi. Assistant Professor, Computer Science and Engineering; Concurrent Assistant Professor, Electrical Engineering. Master of Engineering, Univ. of California-San Diego, 2011; Philosophiae Doctor, ibid., 2017 (2018)

Madhav Raj Joshi. Associate Research Professor, Joan B. Kroc Institute for International Peace. Master of Arts, Tribhuvan University, 2001; Philosophiae Doctor, University of North Texas, 2010 (2010)

Essaka Joshua. Teaching Professor, College Seminar - A&E; Teaching Professor. Bachelor of Arts, University of Oxford, 1991; Master of Arts, ibid., 1995; Philosophiae Doctor, University of Birmingham, 1995 (2008)

Anthony Juan. Professor, Film, Television, and Theatre; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Philosophiae Doctor, University of Athens, 1990 (2005)


Thomas Juliano. Assistant Professor, Aerospace and Mechanical Engineering. Bach of Sci in Aerospace Engr, California Institute of Techno, 2004; Master of Science, Purdue University, 2006; Philosophiae Doctor, ibid., 2010 (2014)

Eric John Junker. Rot-Chib Professor of Aerospace and Mechanical Engineering; Professor, Aerospace and Mechanical Engineering. Bachelor of Science, University of New Mexico Main, 1968; Master of Science, University Wyoming, 1969; Philosophiae Doctor, Air Force Institute Technology, 1975 (1989)


Joseph Paul Kaboski. The David F. and Erin M. Seng Foundation Professor of Economics; Professor, Department of Economics; Fellow, Institute for Real Estate. Bach of Sci in Chemical Engr, Cornell University, 1994; Master of Arts, University of Chicago, 1998; Philosophiae Doctor, ibid., 2001 (2010)

Michael Kackman. Associate Teaching Professor, Film, Television, and Theatre; Concurrent Associate Teaching Professor, American Studies. Bachelor of Fine Arts, Emerson College, 1994; Master of Arts, Univ of Wisconsin-Madison, 1995; Philosophiae Doctor, ibid., 2000 (2015)
Faculty

Prashant V. Kamat. Rev. John A. Zahm Professor of Science; Professor, Chemistry and Biochemistry. Bachelor of Science, Karnataka University, 1972; Master of Science, University of Bombay, 1974; Philosophiae Doctor, ibid., 1979 (1983)

S. Alex Kandel. Associate Professor, Chemistry and Biochemistry. Bachelor of Arts, Yale University, 1993; Philosophiae Doctor, Harvard University, 1999 (2001)

Hana Kang. Associate Professor of the Practice, East Asian Languages and Cultures. Bachelor of Arts, Rutgers State University of NJ, 2001; Master of Arts, Ohio State University, 2004; Philosophiae Doctor, ibid., 2011 (2014)

Jeffrey C. Kantor. Professor, Chemical and Biomolecular Engineering. Bachelor of Science, Univ of Minnesota of Minneapolis, 1976; Master of Arts, Princeton University, 1977; Philosophiae Doctor, ibid., 1981 (1981)

Vamsi Krishna Kanuri. Assistant Professor, Marketing. Bachelor of Technology, Jawaharlal Nehru Technological, 2006; Master of Business Admin, University of Missouri-St. Lou, 2011; Doctor of Philosophy, ibid., 2015 (2018)

Joshua B. Kaplan. Associate Teaching Professor, Political Science; Political Science, Director of Undergraduate Studies. Bachelor of Arts (Latin), Univ California Santa Cruz, 1974; Master of Arts, University of Chicago, 1977 (1987)

Ahsan Kareem. The Robert M. Moran Professor of Civil Engineering; Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, W Pakistan U of Engr and Tech, 1968; Master of Science, University Hawaii Honolulu, 1975; Philosophiae Doctor, Colorado State University, 1978 (1990)

Michelle Ann Karnes. Associate Professor, English. Philosophiae Doctor, Univ of Pennsylvania, 2004; Bachelor of Arts, Univ of California Berkeley, ; Master of Arts, Univ of Pennsylvania, (2016)

Emmanuel Katongole. Professor, Keough School of Global Affairs; Professor, Theology; Fellow, Kellogg Institute for International Studies; Fellow, Center for Social Concerns. Bachelor of Philosophy, Pontificia Universita Gregorian, 1983; Bachelor of Divinity, Pontificia Universitas Urbana, 1987; Master of Philosophy, Catholic University of Louvain, 1993; Master of Religious Education, ibid., 1995; Philosophiae Doctor, ibid., 1996 (2013)

Asher Kaufman. Director, John M. Regan Jr. Director of the Joan B. Kroc Institute for International Peace Studies; Fellow, Kellogg Institute for International Studies; Professor, History; Director, Joan B. Kroc Institute for International Peace. Bachelor of Arts, Hebrew University of Jerusalem, 1989; Master of Arts, ibid., 1994; Philosophiae Doctor, Brandeis University, 2000 (2005)

Tamara Lynn Kay. Associate Professor, Keough School of Global Affairs; Joint Associate Professor, Sociology; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Northwestern University, 1993; Master of Arts, Univ of California Berkeley, 1998; Philosophiae Doctor, ibid., 2004 (2016)


Mary Celeste Kearney. Director of the Gender Studies Program; Associate Professor, Film, Television, and Theatre; Concurrent Associate Professor, American Studies; Director, Gender Studies; Concurrent Associate Professor, Gender Studies. Bachelor of Arts, University of San Diego, 1984; Master of Arts, Georgetown University, 1992; Philosophiae Doctor, Univ of Southern California, 1998 (2013)

Rosemary Ann Kelanic. Assistant Professor, Political Science. B.S. Political Science, Bryn Mawr College, 2002; MS in International Relations, University of Chicago, 2003; Philosophiae Doctor, ibid., 2012 (2016)

Thomas More Kellenberg. Teaching Professor, Political Science; Executive Director of the Washington Program, Washington, DC. Bachelor of Arts, University of Notre Dame, 1980; Juris Doctor, Harvard University, 1986 (1997)


Kenneth Kelley. Professor, IT, Analytics and Operations; Edward Frederick Sorin Society Professor of ITAO; Concurrent Professor, Psychology; Senior Associate Dean, Mendoza College of Business. Bachelor of Arts, University of Cincinnati, 2000; Master of Arts, University of Notre Dame, 2003; Philosophiae Doctor, ibid., 2005 (2008)

Eve Nicole Kelly. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, University of Michigan, 1998 (2015)

Daniel Bruce Kelly. Professor, Law School; Director, Institute for Real Estate; Fellow, Institute for Real Estate. Bachelor of Arts, University of Notre Dame, 2002; Juris Doctor, Harvard University, 2005 (2009)

Peter Wiest Kelly. Assistant Professor, Finance. Bachelor of Science, University of Notre Dame, 2009; Master of Accountancy, Yale University, 2012; Master of Philosophy, ibid., 2012; Philosophiae Doctor, ibid., 2015 (2015)

James Joseph Kelly, Jr. Clinical Professor, Clinical Law Center; Fellow, Institute for Real Estate. Bachelor of Philosophy, University of Virginia, 1987; Juris Doctor, Columbia University, 1994 (2011)


Andrew Brian Kennedy. Concurrent Professor, Aerospace and Mechanical Engineering; Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, Queen’s University, 1991; Master of Science, Univ. of British Columbia, 1993; Philosophiae Doctor, Monash University, 1998 (2008)

Mary Martha Keys. Associate Professor, Political Science. Bachelor of Arts, Boston College, 1988; Master of Arts, University of Toronto, 1989; Philosophiae Doctor, ibid., 1998 (1994)

Kapil Khandelwal. Associate Professor, Civil & Environmental Engineering & Earth Sciences. Master of Arts, Indian Inst of Tech-Delhi, 2000; Philosophiae Doctor, University of Michigan, 2008 (2008)

Yazen Khasawneh. Associate Teaching Professor, Civil & Engr Engr & Earth Sciences. Bach of Sci in Civil Engr, Jordan Univ of Science & Techn, 1995; Master of Engineering, Univ of IL Urbana-Champaign, 2012; Philosophiae Doctor, Purdue University, 2014 (2020)

Tracy Lynn Kijewski-Correa. Leo E. and Patti Ruth Lusbeck Professor of Engineering; Fellow, Institute for Real Estate; Associate Professor, Civil Engr & Env & Earth Sciences. Bach of Sci in Civil Engr, University of Notre Dame, 1997; M.S. Civil Engr, ibid., 2000; Philosophiae Doctor, ibid., 2003 (2003)

Clare Kilbane. Professor of the Practice, McGrath Institute for Church Life. B Science Education, University of Dayton, 1993; Master of Arts, Ohio State University, 1997; Philosophiae Doctor, University of Virginia, 2000 (2018)

To Table of Contents
Michael Alexander Kilburn. Assistant Teaching Professor, Physics. Philosophiae Doctor, Michigan State University, 2011 (2011)

Choon Keun Kim. Research Assistant Professor, Chemistry and Biochemistry. Bachelor of Science, Chonnam National University, 1996; Master of Science, ibid., 1999; Philosophiae Doctor, University of Notre Dame, 2006 (2015)

John Paul Kimes. Associate Professor of the Practice, Dean’s Office-Law School. Bachelor of Arts, University of Notre Dame, 1995; Bachelor of Theology, Pontifical Gregorian University, 1999 (2020)

Edward Kinzel. Associate Professor, Aerospace and Mechanical Engineering. Bach of Sci in Mech Engr, Purdue University, 2003; Master in Mechanical Engr, ibid., 2005; Philosophiae Doctor, ibid., 2010 (2019)


Scott Kirycki. Assistant Librarian, Hough Libraries. Bachelor of Arts, Calvin College, 1994; Master of Arts, Clark University, 1995; Master of Science, University of Michigan, 2017 (2017)

Michael Patrick Kitz. Associate Teaching Professor, Dean’s Office-Coll. of Engineering. Executive Director, of Summer Engineering Programs, College of Engineering; Associate Director, Integrated Engineering Business Practices and Curriculum, College of Engineering. . Bachelor of Arts, University of Notre Dame, 1985; Bachelor of Science, ibid., 1985; Master of Business Admin, University of Michigan, 1989 (2012)

Tanyel Kiziltepe Bilgicer. Assistant Teaching Professor, Chemical and Biomolecular Eng. Bachelor of Science, Bilkent University, 1998; Philosophiae Doctor, Massachusetts Institute of Tec, 2005 (2008)


Matthew Joseph Kloser. Associate Professor of the Practice, Inst for Educational Initiatives; Concurrent Associate Professional Specialist, College of Science. Bachelor of Arts, University of Notre Dame, 2002; Master of Education, ibid., 2004; Master of Science, Stanford University, 2010; Philosophiae Doctor, ibid., 2011 (2012)

Julia F. Knight. The Charles L. Huisking Professor of Mathematics; Professor, Mathematics. Bachelor of Arts, Utah State University, 1964; Philosophiae Doctor, Univ of California Berkeley, 1972 (1977)

Laura L. Knoppers. George N. Shuster Professor of English Literature; Professor, English. Bachelor of Arts, Calvin College, 1979; Master of Arts, Harvard University, 1981; Philosophiae Doctor, ibid., 1986 (2014)


Joshua David Koen. Assistant Professor, Psychology. Bachelor of Science, University Texas Arlington, 2007; Master of Science, Univ California Davis, 2010; Philosophiae Doctor, ibid., 2013 (2018)

Cristian Koepfli. Assistant Professor, Biological Sciences. Bachelor of Science, University of Zurich, 2005; Master of Science, ibid., 2006; Doctor of Science, Swiss TPH, 2012 (2018)

Karrie J Koesel. Associate Professor, Political Science; Fellow, Nanovic Institute for European Studies; Concurrent Associate Professor, Keough School of Global Affairs. Bachelor of Arts, Drake University, 1997; Master of Arts, University of Notre Dame, 2001; Master of Arts, Cornell University, 2005; Philosophiae Doctor, ibid., 2009 (2015)

Peter Michael Kogge. Ted H. McCourtney Professor of Computer Science and Engineering; Professor, Computer Science and Engineering. Bachelor of Science, University of Notre Dame, 1968; Master of Science, Syracuse University, 1970; Philosophiae Doctor, Stanford University, 1973 (1994)

Kathleen Joanne S. Kolberg. Teaching Professor, Preprofessional Studies; Assistant Dean, College of Science. Bachelor of Arts, Albion College, 1980; Philosophiae Doctor, University of Notre Dame, 1989 (1993)

Christopher F. Kolda. Professor, Physics; Glynn Family Honors Professor in the College of Science; Director, Glynn Family Honors Program. Bachelor of Arts, Johns Hopkins University, 1990; Master of Arts, University of Michigan, 1992; Philosophiae Doctor, ibid., 1995 (2000)

Elisabeth Koll. William Payden Associate Professor; Department Chair, History; Professor, History. Bachelor of Arts, Fudan University, 1988; Master of Arts, University of Bonn, 1992; Philosophiae Doctor, University of Oxford, 1998 (2015)

Paul Vincent Kollman, CSC. Associate Professor, Theology; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 1984; Master of Divinity, ibid., 1990; Philosophiae Doctor, University of Chicago, 2001 (2001)

Illeen Onyadouh Kondo. Fellow, Kellogg Institute for International Studies; Assistant Professor, Department of Economics. Master of Science, Georgia Institute of Technolog, 2006; Philosophiae Doctor, University of Minnesota, 2012 (2017)

Maciej Kotowski. Associate Professor, Department of Economics. Bachelor of Arts, McGill University, 2006; Philosophiae Doctor, Univ of California Berkeley, 2011 (2020)

Janet A. Kourany. Associate Professor, Philosophy; Concurrent Associate Professor, Gender Studies. Bachelor of Science, Columbia University, 1965; Philosophiae Doctor, ibid., 1977 (1998)

Evgenii Kovriguine. Research Associate Professor, Chemistry and Biochemistry. Bachelor of Science, Krasnoyarsk State University, 1993; Master of Science, Moscow State University, 1995; Philosophiae Doctor, Engelhardt Inst of Molec. Biol, 1999 (2018)

Zachary Kowalski. Assistant Professor, Accountancy. Bachelor of Science, University of Wisconsin Center, 2008; Master of Accountancy, ibid., 2009; Philosophiae Doctor, ibid., 2018 (2018)

Monica Jane Kowalski. Assistant Teaching Professor, Inst for Educational Initiatives. Bachelor of Arts, University of Notre Dame, 2003; Master of Education, ibid., 2005; Philosophiae Doctor, Ohio State University, 2013 (2012)

Julia Kowalski. Assistant Professor, Keough School of Global Affairs; Concurrent Assistant Professor, Gender Studies; Concurrent Assistant Professor, Anthropology. Bachelor of Arts, University of Chicago, 2005; Master of Arts, ibid., 2009; Doctor of Philosophy, ibid., 2014 (2018)


Katharina Kraus. Associate Professor, Philosophy. Bachelor of Arts, University of Heidelberg, 2009; Master Degree - Unspecified, ibid., 2010; Philosophiae Doctor, University of Cambridge, 2014 (2017)


Sarah Kroeger. Research Assistant Professor, Department of Economics. Bachelor of Arts, Coll of William & Mary, 2003; Master of Arts, Boston University, 2007; Philosophiae Doctor, ibid., 2013 (2017)

Brian Alexander Krostenko. Associate Professor, Classics. Bachelor of Arts, Princeton University, 1986; Master of Arts, Harvard University, 1989; Philosophiae Doctor, ibid., 1993 (2001)

Krupali Arun Kruische. Associate Professor, School of Architecture; Associate Dean for Research, Scholarship & Creative Work, School of Architecture; Fellow, Institute for Real Estate. Master of Arts, Hochschule de Kunste, 2003; Philosophiae Doctor, Technical University of Dresde, 2017 (2005)

Gregory Peter Kucich. Professor, English. Bachelor of Arts, San Francisco State University, 1978; Master of Arts, University of Michigan, 1979; Philosophiae Doctor, ibid., 1983 (1983)

Ian Kuijt. Professor, Anthropology. Bachelor of Arts, University of Lethbridge, 1984; Master of Arts, Simon Fraser University, 1988; Master of Arts, Harvard University, 1991; Philosophiae Doctor, ibid., 1995 (2000)

Shreya Kumar. Assistant Teaching Professor, Computer Science and Engineering. B.S. Engineering Science, University of Pune, 2007; Master of Engineering, Michigan Technological Univ, 2013; Philosophiae Doctor, ibid., 2015 (2016)

Masaru K. Kuno. Professor, Chemistry and Biochemistry; Concurrent Professor, Physics. Bachelor of Arts, Washington University, 1993; Doctor of Science, Massachusetts Institute of Tec, 1998 (2003)

Yahya C. Kurama. Professor, Civil & Environmental Engineering & Earth Sciences; Associate Chair, Civil & Environmental Engineering & Earth Sciences; Fellow, Institute for Real Estate. Bachelor of Science, Bogazici University, 1990; Master of Science, Lehigh University, 1993; Philosophiae Doctor, ibid., 1997 (1998)

Robert Lee Kusmer. Librarian, Hesburgh Libraries. Bachelor of Arts, Cleveland State University, 1972; Master of Arts, Northwestern University, 1977; Philosophiae Doctor, ibid., 1983; Master in Library Science, Kent State University, 1988 (1997)

Dae Kun Kwon. Research Assistant Professor, Civil & Environmental Engineering & Earth Sciences. Bach of Sci in Civil Engr, Yonsei University, 1993; M.S. Civil Engr, Korea Advanced Institute of Sc, 1995; Philosophiae Doctor, ibid., 2001 (2006)

George P Lachicotte. Professor, Army Science. Bachelor of Science, University Tennessee Knoxville, 2000; Bachelor of Science, ibid., 2000; Bachelor of Science, ibid., 2000; Bachelor of Science, ibid., 2000; Bachelor of Science, University of Kansas, 2012; Master of Science, U.S. Army Command and General, 2013; Master of Arts, ibid., 2013 (2018)


Manuela Lahne. Assistant Research Professor, Biological Sciences. Philosophiae Doctor, University College, 2007 (2009)

Jason Richard Lahr. Associate Professor, Art, Art History, and Design. Bachelor of Fine Arts, Clarion University of PA, 1997; Master of Fine Arts, Pennsylvania St University, 1999 (2010)

John Patrick Lalor. Assistant Professor, IT, Analytics and Operations. Bachelor of Business Admin., University of Notre Dame, 2011; M.S. Computer Sci and Engr, DePaul University, 2015; Philosophiae Doctor, Univ of Massachusetts, 2019 (2019)

Gary A. Lamberti. Professor, Biological Sciences; Gillen Acting Director, UNDERC. Bachelor of Science, Univ California Davis, 1975; Philosophiae Doctor, Univ of California Berkeley, 1983 (1989)

Stephen J Lancaster. Associate Professor of the Practice, Music. Bachelor of Music, Moody Bible Institute, 2003; Master of Music, University of Notre Dame, 2005; Doctor of Music, University of Michigan, 2008 (2007)


Amy Gill Langenkamp. Associate Professor, Sociology. Bachelor of Arts, Villanova University, 1997; Master of Arts, Univ of Texas-Austin, 2001; Philosophiae Doctor, ibid., 2007 (2011)

Kevin Lannon. Professor, Physics. Bachelor of Arts, St. Norbert College, 1997; Philosophiae Doctor, Univ of IL Urbana-Champaign, 2003 (2008)

David Manuel Lantigua. Assistant Professor, Theology. Bachelor of Arts, University of South Florida, 2004; Master of Arts, Univ of South Florida, 2007; Philosophiae Doctor, University of Notre Dame, 2012 (2016)


Daniel K. Lapsley. Professor, Psychology; Professor of Psychology and Alliance for Catholic Education (ACE) College Chair. Bachelor of Arts, Indiana University of Pennsylvania, 1977; Master of Science, University of New Orleans, 1979; Philosophiae Doctor, Univ of Wisconsin-Madison, 1982 (2006)

Stephanie LaRocque. Associate Professor, Accountancy; EV Faculty Fellow. Bachelor of Arts, University of Western Ontario, 1992; Philosophiae Doctor, University of Toronto, 2009 (2009)

Jay A. LaVerne. Concurrent Professional Specialist, Physics; Research Professor, Radiation Laboratory. Bachelor of Science, Lamar University, 1972; Philosophiae Doctor, Univ of Nebraska-Lincoln, 1981 (1978)


Kristian Y Lax-Walker. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, Indiana Univ South Bend, 2007; Master of Science, Kansas State University, 2016 (2009)

James Leady, Associate Teaching Professor, Finance; Associate Dean for Undergraduate Education, Mendoza College of Business. Bachelor of Science, U. S. Military Academy, 1991; Master of Arts (Latin), University of Michigan, 1997; Philosophiae Doctor, ibid., 2011 (2006)

Charles I Leavitt. Assistant Professor, Romance Languages and Literatures. Bachelor of Arts, Univ of Oregon, 2002; Master of Arts, University of Notre Dame, 2005; Philosophiae Doctor, ibid., 2010 (2018)

Byung-Joo Lee. Associate Professor, Department of Economics. Bachelor of Science, Seoul National University, 1982; Master of Arts, Pennsylvania State University, 1984; Master of Science, Univ of Wisconsin-Madison, 1986; Philosophiae Doctor, ibid., 1988 (1996)

Eungkyu Lee. Research Assistant Professor, Aerospace and Mechanical Engineering. Bachelor of Science, Kyunghee University, 2009; Philosophiae Doctor, Seoul National University, 2015 (2015)

Shaun Wook Lee. Ann and Daniel Manohan Associate Professor in Rare and Neglected Disease; Associate Professor, Biological Sciences. Bachelor of Architecture, Univ of California Berkeley, 1994; Bachelor of Arts, ibid., 1994; Philosophiae Doctor, Oregon Health Sciences Univ, 2003 (2009)

Mijoon Lee. Associate Research Professor, Chemistry and Biochemistry; Associate Professor of the Practice. Bachelor of Science, Pohang Inst. of Sci. & Tech., 1995; Philosophiae Doctor, ibid., 2001 (2003)

W. Matthew Leesy. Associate Research Professor, Biological Sciences. Bachelor of Science, Univ of IL Urbana-Champaign, 2000; Philosophiae Doctor, Washington University, 2005 (2008)

Ulrich Lucas Lehner. William K. Warren Foundation Professor of Theology; Professor, Theology. Bachelor of Arts, Hochschule fur Philosophie, 2000; Philosophiae Doctor, University of Regensburg, 2006 (2019)

Nicolas Lehner. Research Professor, Physics. Bachelor of Science, Louis Pasteur Univ Strasbourg, 1994; Master of Science, ibid., 1995; Philosophiae Doctor, Queens University of Belfast, 2000 (2005)

Norman Shane Leib. Assistant Teaching Professor, Applied Computational Math & Stats. Bachelor of Science, Indiana State University Main, University of Notre Dame, Md. Bachelor of Science, ibid., 1994; Bachelor of Science, ibid., 1994; Bachelor of Science, ibid., 2020)

David T. Leightton, Jr. Professor, Chemical and Biomedical Engineering. Bachelor of Science, Princeton University, 1980; Master of Science, Stanford University, 1981; Philosophiae Doctor, ibid., 1985 (1986)


Erin Moira Lenrow. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, University of Michigan, 1997; Philosophiae Doctor, Indiana Univ-Bloomington, 2014; Master of Arts, ibid., 2014 (2014)

Craig Stanley Lent. The Frank M. Freimann Chair in Engineering (IV); Professor, Electrical Engineering; Concurrent Professor, Physics. Bachelor of Arts, Univ of California Berkeley, 1978; Philosophiae Doctor, Univ of Minnesota Minneapolis, 1984 (1985)

Giovanna Lenzi-Sandusky. Associate Professor of the Practice, Deans Off-School of Architecture. Laurea, University of Florence, 1979 (1990)


Robert Lewandowski. Director of Online Initiatives; Associate Teaching Professor, IT, Analytics and Operations. Bachelor of Arts, Purdue University, 1996; Master of Science, ibid., 2002 (2004)

Kristin Marie Lewis. Associate Teaching Professor, Biological Sciences. Bachelor of Science, University of Notre Dame, 1991; M.S. Biology, ibid., 1997 (1997)

David Frazer Lewis. Assistant Professor, School of Architecture. Bachelor of Arts, Stanford University, 2006; Master of Philosophy, University of Cambridge, 2007; Doctor of Philosophy, University of Oxford, 2014 (2019)

Blake Leyerle. Associate Professor, Theology. Bachelor of Arts, Yale University, 1982; Master of Arts, Duke University, 1988; Philosophiae Doctor, ibid., 1991 (1990)

Jun Li. Associate Professor, Applied Computational Mathematics & Statistics. Bachelor of Engineering, Tsinghua University, 2004; Master of Science, ibid., 2007; Philosophiae Doctor, Stanford University, 2012 (2012)

Lei Li. Associate Professor, Biological Sciences. Bachelor of Science, Shandong Medical University, 1985; Philosophiae Doctor, Georgia State University, 1995 (2003)

John Stephen Liberatore. Assistant Professor, Music; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Syracuse University, 2007; Master of Arts, Eastman School Music, 2009; Philosophiae Doctor, ibid., 2014 (2015)


Ethan Lieber. Associate Professor, Department of Economics. Bachelor of Arts, University of Chicago, 2004; Master of Arts, ibid., 2008; Philosophiae Doctor, ibid., 2013 (2013)

Marya Lieberman. Professor, Chemistry and Biochemistry. Bachelor of Science, Massachusetts Institute of Tec, 1989; Philosophiae Doctor, Univ of Washington, 1994 (1996)

James Martin Lies, CSC. Teaching Professor, London Program Administration. Bachelor of Arts, Univ of St. Thomas, 1984; Master of Arts, University of Notre Dame, 1987; Master of Divinity, Jesuit School of Theology, 1996; Philosophiae Doctor, University of Minnesota, 2005 (2017)


Hai Lin. Professor, Electrical Engineering. Bachelor of Science, University of Science & Techno, 1997; Master of Science, Chinese Academy of Sciences, 2000; Master of Science, University of Notre Dame, 2002; Philosophiae Doctor, ibid., 2005 (2012)


Faculty

Daniel A. Lindley, III. Associate Professor, Political Science. Bachelor of Arts, Tufts University, 1983; PhD, Massachusetts Institute of Technology, 1999 (1999).


Aliaksandra Lisouskaya. Research Assistant Professor, Radiation Laboratory. Bachelor of Science, Belarusian State University, 2008; Master of Science, ibid., 2009; PhD, Harvard University, 2003 (2012).

Laurie Elizabeth Littlepage. Campbell Family Assistant Professor of Cancer Research; Associate Professor, Chemistry and Biochemistry. Bachelor of Science, Univ of Texas-Austin, 1995; PhD, Harvard University, 2003 (2012).

Cheng Liu. Research Assistant Professor, Psychology. B.S. Physics, China University of Science and Technology, 2004; Bachelor of Science, University of Science & Techon, 2004; PhD, University of Illinois Urbana-Champaign, 2011 (2011).

Lei Liu. Associate Professor, Electrical Engineering. Bachelor of Science, Nanjing University, 1998; M.S. Electrical Engr., ibid., 2001; PhD, University of Virginia, 2007 (2009).

Chao-Shin Liu. Associate Professor, Accountancy. Bachelor of Business Admin., National Taiwan University, 1979; Master of Business Admin, National Chengchi University, 1983; PhD, University of Illinois Urbana-Champaign, 1992 (1992).

Fang Liu. Professor, Applied Computational Math & Stats. Bachelor of Science, Peking University, 1997; Master of Science, Iowa State University, 1999; PhD, University of Michigan, 2003 (2011).

Xinyu Liu. Research Associate Professor, Physics. Bachelor of Science, Univ. of Sci. & Tech. of China, 1993; Master of Science, ibid., 1996; PhD, University of Notre Dame, 2003 (2002).


Neil Francis Lobo. Research Professor, Biological Sciences. B.S. Microbiology, St. Joseph's College, 1995; PhD, University of Notre Dame, 2001 (2000).

Angela R Logan. Associate Teaching Professor, Management & Organization; Director, St. Andre Bessette Center for Nonprofit Professional Development. Bachelor of Arts, University of Toledo, 1994; Master of Business Admin, Defiance College, 2001; PhD, University of Virginia, 2014 (2013).


John M. LoSecco. Professor, Physics; Concurrent Professor, Monroe First Year Experience. Bachelor of Science, Cooper Union, 1972; Master of Arts, Harvard University, 1973; PhD, University of Virginia, 1976 (1985).

Johnathan Albert Loudis. Assistant Professor. Associate of Business, Dartmouth College, 2005; Bachelor of Engineering, ibid., 2005; Master of Science, ibid., 2007; PhD, University of Chicago, 2019 (2019).

Timothy James Loughran. The C. R. Smith Professor of Finance; Professor, Finance. Bachelor of Arts, Univ of Illinois Urbana-Champaign, 1984; Bachelor of Science, ibid., 1985; Master of Business Admin, Indiana Univ-Bloomington, 1989; PhD, University of Virginia, 1993 (1999).

Iossif Lovozovatsky. Research Professor, Civil & Environmental Engineering & Earth Sciences. Master of Science, Moscow State University, 1971; PhD, University of Virginia, 1975 (2010).

Xueming N.A. Lu. Assistant Teaching Professor, Biological Sciences. Bachelor of Science, Tsinghua University, 2004; PhD, University of Illinois Urbana-Champaign, 2010 (2016).

Xin Lu. John M. and Mary Jo Boler Assistant Professor, Boler-Parseghian Center for Rare and Neglected Diseases; Assistant Professor, Biological Sciences. Bachelor of Science, Tsinghua University, 2004; PhD, University of Pittsburgh, 2010 (2017).

John Ryan Lueker. Professor of the Practice, Dean's Office - Graduate School; Concurrent Professor of the Practice, Psychology. Bachelor of Arts, University of Notre Dame, 2000; Master of Arts, James Madison University, 2003; PhD, University of Virginia, 2006 (2011).

Cecilia Lucero. Associate Advising Professor, Center for University Advising. Bachelor of Arts, University of Notre Dame, 1984; Master of Arts, University of Colorado, 1990; PhD, University of Michigan, 2002 (1998).

Joshua Kristofer Lund. Professor, Romance Languages and Literatures; Director of Graduate Studies, Romance Languages and Literatures - Spanish and French. Bachelor of Arts, Gustavus Adolphus College, 1991; Master of Arts, University of Minnesota, 1998; PhD, University of Michigan, 2002 (2015).

James McMurrin Lundberg. Assistant Professor of the Practice, History; Director of Undergraduate Studies, History. Bachelor of Arts, Connecticut College, 2000; Master of Arts, Yale University, 2005; PhD, University of Virginia, 2009 (2016).

Tengfei Luo. Dorini Family Collegiate Chair in Engineering; Professor, Aerospace and Mechanical Engineering; Director, Science, Xi'an Jiaotong University, 2005; PhD, University of Michigan, 2009 (2012).

Natalia Lyandres. Fellow, Nanovic Institute for European Studies; Librarian, Hesburgh Libraries. Bachelor of Arts, Moscow State University, 1990; M.S. Librarianship, San Jose State University, 1993 (2019).

Samson Lyandres. Professor, History; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, St. Petersburg University, 1980; Master of Arts, Boston University, 1987; Master of Arts, Stanford University, 1988; PhD, University of Virginia, 1992 (2001).


Congcong Ma. Assistant Professional Specialist, East Asian Languages and Cultures. Bachelor of Arts, Minzu University, 2009; Master of Arts, Beijing Normal University, 2012 (2012).


Jonathan Francis MacArt. Instructor, Aerospace and Mechanical Engineering. Bachelor of Science, University of Notre Dame, 2013; Master in Mechanical Engineering, Princeton University, 2015; PhD, University of Michigan, 2018 (2020).
Faculty

Tim William Machan. Professor, English; Mary Lee Duda Chair in Literature. Bachelor of Arts, Univ of Wisconsin-Madison, 1978; Master of Arts, Durham University, 1979; Philosophiae Doctor, Univ of Wisconsin-Madison, 1984 (2013)

Louis MacKenzie. Associate Professor, Romance Languages and Literatures; Romance Languages and Literatures, French, Director of Undergraduate Studies. Bachelor of Arts, University of Notre Dame, 1969; Master of Arts, Middlebury College, 1972; Philosophiae Doctor, Cornell University, 1977 (1983)

Nicole R MacLaughlin. Associate Teaching Professor, Univ Writing Program. Bachelor of Arts, Univ of IL Urbana-Champaign, 1992; Master of Arts, ibid., 1995; Master of Arts, ibid., 1995 (2007)

Tara Aine MacLeod. Associate Teaching Professor, Irish Language and Literature. Bachelor of Science, University College Dublin, 1991; Master of Science, University College Cork, 1997 (2008)


Kiran V Mahasenan. Assistant Research Professor, Chemistry and Biochemistry. Philosophiae Doctor, Ohio State University, 2012 (2012)

Katharine Stacie Mahon. Assistant Advising Professor, Center for University Advising. Bachelor of Arts, Augsburg College, 2006; Master Degree - Unspecified, Boston College, 2010; Philosophiae Doctor, University of Notre Dame, 2017 (2017)

Scott P. Mainwaring. Professor, Political Science. Bachelor of Arts, Yale University, 1976; Master of Arts, ibid., 1976; Philosophiae Doctor, Stanford University, 1983 (2019)

Linda J. Major. Director of the College Seminar Program; Associate Teaching Professor, Medieval Institute; Director of Undergraduate Studies, Medieval Institute. Bachelor of Arts, University of St Francis, 1973; Master of Medieval Studies, University of Notre Dame, 1983 (2008)


Edward A. Malloy, CSC. Professor, Philosophy. Bachelor of Arts, University of Notre Dame, 1963; Master of Arts, ibid., 1967; Master of Theology, ibid., 1969; Philosophiae Doctor, Vanderbilt University, 1975 (1974)

Theodore Eugene Mandell. Associate Teaching Professor, Film, Television, and Theatre. Bachelor of Arts, University of Notre Dame, 1986; Master of Arts, University of Iowa, 1989 (1988)

Elena Maria Mangione-Lora. Teaching Professor, Romance Languages and Literatures; Associate Teaching Professor. Bachelor of Arts, Saint Mary's College, 1990; Master of Arts, University of Notre Dame, 1998 (1998)

Michael Joseph Mannor. Associate Professor, Management & Organization; Associate Dean for the MBA Program, Mendoza College of Business; John F O'Shaughnessy Associate Professor of Family Enterprise. Bachelor of Science, Aquinas College, 2002; Master of Business Admin, Grand Valley State Univ, 2004; Philosophiae Doctor, Michigan State University, 2007 (2008)

Khachatur Manukyan. Assistant Research Professor, Physics. Bachelor of Science, Yerevan State University, 2001; Master of Science, ibid., 2003; Philosophiae Doctor, ibid., 2006 (2014)

Lesley Grace Sullivan Marcantonio. Assistant Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, University of Notre Dame, 2013; Master of Arts, ibid., 2016 (2016)

Sara Marcus. Assistant Professor, English. Bachelor of Arts, Oberlin College, 1999; Master of Fine Arts, Columbia University, 2009; Philosophiae Doctor, Princeton University, 2018 (2020)

Nancy Marinelli. Associate Research Professor, Physics. Bachelor of Arts, University of Bari, 1993; Philosophiae Doctor, ibid., 1997 (2008)


Kate Elizabeth Marshall. Concurrent Associate Professor, American Studies; Associate Professor, English. Bachelor of Arts, Univ California Davis, 1997; Master of Arts, Univ of Southern California, 2006; Philosophiae Doctor, Univ.of California-Los Angeles, 2009 (2009)

Alexander Martin. Professor, History; Concurrent Professor, German and Russian Languages and Literature; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Cornell University, 1985; Master of Arts, Columbia University, 1986; Philosophiae Doctor, Univ of Pennsylvania, 1993 (2006)

Jennifer Newsome Martin. Concurrent Assistant Professor, Theology; Associate Professor, Program of Liberal Studies. Bachelor of Arts, Atlanta Christian College, 2002; Master of Theological Studies, University of Notre Dame, 2007; Philosophiae Doctor, ibid., 2012 (2005)

Holly Elizabeth Martin. Advising Professor, Center for University Advising. Bachelor of Arts, Saint Olaf College, 1978; Master of Arts, University of Notre Dame, 1979; Philosophiae Doctor, ibid., 1983 (1983)

Kirsten Edrie MacDonald Martin. Professor, IT, Analytics and Operations. Bachelor of Science, University of Michigan, 1993; Master of Business Admin, University of Virginia, 1999; Philosophiae Doctor, ibid., 2006 (2020)

Adam Martin. Tom and Carolyn Marquez Assistant Professor of Physics; Associate Professor, Physics. Bachelor of Science, Univ of Wisconsin-Madison, 2001; Philosophiae Doctor, Boston University, 2007 (2012)


Francisco De Asis Martinez Jerez. Associate Professor, Accountancy; KPMG Faculty Fellow. Master of Arts, Pontifical Univ of Comillas, 1985; Master of Science, ibid., 1986; Master of Business Admin, Harvard University, 1991; Philosophiae Doctor, ibid., 2002 (2013)

Faculty

Ricardo David Martinez-Schuldt. Assistant Professor, Sociology. Bachelor Degree - Unspecified, Saint Cloud State University, 2012; Bachelor of Arts, ibid., 2012; Master of Arts, UNC at Chapel Hill, 2015; Philosophiae Doctor, University of North Carolina A, 2019 (2019)

Thomas G. Marullo. Professor, German and Russian Languages and Literature. Bachelor of Arts, College of the Holy Cross, 1970; Master of Arts, Cornell University, 1971; Philosophiae Doctor, ibid., 1975; Master of Business Admin, Indiana Univ South Bend, 1989 (1975)


Nancy Masters. Assistant Clinical Professor, Inst for Educational Initiatives. Bachelor of Arts, Saint Mary's College, 1976; Master of Science, Indiana Univ South Bend, 1979 (2001)

Grant James Mathews. Professor, Physics. Bachelor of Science, Michigan State University, 1972; Philosophiae Doctor, University of Maryland Univers, 1977 (1994)


Timothy M. Matovina. Professor, Theology; Concurrent Professor, American Studies. Bachelor of Arts in Education, Indiana Univ-Bloomington, 1978; Master of Divinity, University of St Michaels Coll, 1983; Philosophiae Doctor, Catholic University of America, 1993 (2000)

Ben Sang Hun Matthies. Assistant Professor. Bachelor of Arts, Dartmouth College, 2010 (2019)

William C. Mattison. III. Associate Professor, Theology; Wiley Family Associate Professor. Bachelor of Arts, Georgetown University, 1993; Master of Arts, Trinity College, 1995; Master of Theological Studies, Weston School of Theology, 1997; Philosophiae Doctor, University of Notre Dame, 2003 (2016)

Sara L. Maurer. Associate Professor, English. Bachelor of Arts, Rice University, 1995; Master of Arts, Indiana Univ-Bloomington, 1997; Philosophiae Doctor, ibid., 2003 (2003)

Cinda May. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, University of Orleans, ; Master in Library Science, University of Michigan, ; Master of Arts, Indiana-Purdue Univ Indpls, ; Master of Arts, Univ of Texas-Austin, (2019)


David Thomas Mayernik. Associate Professor, School of Architecture; Fellow, Nanovic Institute for European Studies; Fellow, Institute for Real Estate. Bachelor of Architecture, University of Notre Dame, 1983 (2002)

Gail Anne Mayotte. Teaching Professor, Alliance for Catholic Education. Bachelor Degree - Unspecified, University of Lowell, 1983; Master Degree - Unspecified, Boston College, 1991; Philosophiae Doctor, ibid., 2001 (2004)

Christine M. Maziar. Vice President and Senior Associate Provost for Budget and Planning, Office of the Provost; Professor, Electrical Engineering. Bach of Sci in Electrical Engr, Purdue University, 1981; M.S. Electrical Engr, ibid., 1984; Philosophiae Doctor, ibid., 1986 (2004)

Elizabeth F. Mazurek. Associate Professor, Classics. Bachelor of Arts, Dickinson College, 1983; Master of Arts, UNC at Chapel Hill, 1985; Philosophiae Doctor, ibid., 1988 (1990)

Tadeusz R. Mazurek. Teaching Professor, Classics - Greco-Roman, Director of Undergraduate Studies. Bachelor of Arts, Yale University, 1985; Philosophiae Doctor, UNC at Chapel Hill, 1997 (1997)

Ettore Mazzola. Professor of the Practice, Architecture-Rome; Associate Professor of the Practice, School of Architecture Rome Program. Master of Architecture, La Sapienza Univ of Rome, 1992 (2017)


A. James McAdams. Dr. Scholl Professor of International Affairs; Professor, Political Science; Fellow, Nanovic Institute for European Studies; Concurrent Professor, History; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, Earlham College, 1976; Master of Arts, Univ of California Berkeley, 1977; Philosophiae Doctor, ibid., 1983 (1992)

Jennifer Mason McAward. Associate Professor, Law School; Director, Human Rights Graduate Programs. Bachelor of Arts, University of Notre Dame, 1994; Juris Doctor, New York University, 1998 (2006)


Elizabeth Aura McClintock. Associate Professor, Sociology. Bachelor of Arts, Princeton University, 2003; Master of Arts, Stanford University, 2005; Philosophiae Doctor, ibid., 2011 (2011)

Barry McCrea. Donald R. Keough Family Professor of Irish Studies; Professor, English; Concurrent Professor, Romance Languages and Literatures; Concurrent Professor, Irish Language and Literature. Bachelor of Arts, Univ of Dublin Trinity College, 1997; Philosophiae Doctor, Princeton University, 2004 (2012)

Mark J. McCreary. Professor, Chemical and Biomolecular Engineering; Senior Associate Dean, College of Engineering. Bach of Sci in Civil Engr, University of Delaware, 1979; Master of Science, Univ of IL Urbana-Champaign, 1981; Philosophiae Doctor, ibid., 1984 (1984)


Bill D. McDonald. Professor, Finance. Bachelor of Science, Central Missouri State Univers, 1975; Master of Business Admin, Arizona State University, 1976; Philosophiae Doctor, ibid., 1979 (1979)

Nyree Valeah McDonald. Associate Dean, Graduate Enrollment Management, Graduate School; Professor of the Practice, Dean's Office - Graduate School. Bachelor of Science, Tuskegee Institute, 1994; Master of Science, Univ Alaska Anchorage, 2000; Master of Science, University of Notre Dame, 2003; Philosophiae Doctor, ibid., 2006 (2009)

Terence McDonnell. Concurrent Associate Professor, American Studies; Associate Professor, Sociology; Concurrent Associate Professor, Keough School of Global Affairs; Director of Graduate Studies, Sociology. Bachelor of Arts, University of Virginia, 2000; Philosophiae Doctor, Northwestern University, 2009 (2011)
Erin McDonnell. Concurrent, African and African American Studies; Concurrent, Keough School of Global Affairs; Associate Professor, Sociology. B.S., Education, Northwestern University, 2002; Philosophiae Doctor, ibid., 2012 (2011)

Denis Richard McDonough. Professor of the Practice, Keough School of Global Affairs. B.A. History, Saint John's University, 1992; MS in International Relations, Georgetown University, 1996 (2017)

Mary Ann McDowell. Associate Professor, Biological Sciences. Bachelor of Science, Univ of Nebraska-Lincoln, 1988; Master of Science, ibid., 1990; Philosophiae Doctor, Univ of Wisconsin-Madison, 1995 (2001)

Paul J. McGinn. Professor, Chemical and Biomolecular Engineering. Bachelor of Science, University of Notre Dame, 1980; M.S. Metallurgical Engr, ibid., 1983; Philosophiae Doctor, ibid., 1984 (1987)

John Thomas McGreevy. Professor, History; Concurrent Professor, American Studies; Francis A. McaNaney Professor of History. Bachelor of Arts, University of Notre Dame, 1986; Master of Arts, Stanford University, 1987; Philosophiae Doctor, ibid., 1992 (1997)

Amanda McKendree. Associate Teaching Professor, Management & Organization; Director, Management & Organization. Bachelor of Arts, Chatham College, 2001; Master of Public Administration, University of Pittsburgh, 2003; Philosophiae Doctor, Duquesne University, 2009 (2009)

Maria Kathleen McKenna. Associate Professor of the Practice, Inst for Educational Initiatives; Associate Professor of the Practice, African and African American Studies; Faculty Co-Director, AnBryce Scholars Initiative. Bachelor of Arts, University of Notre Dame, 1997; Master of Science, Northwestern University, 1998; Philosophiae Doctor, Saint Louis University, 2010 (2009)

Mark Philip McKenna. Professor, Law School; John P. Murphy Foundation Professor of Law. Bachelor of Arts, University of Notre Dame, 1997; Juris Doctor, University of Virginia, 2000 (2008)

Gerald P. McKenny. Walter Professor of Theology; Professor, Theology. Bachelor of Arts, Wheaton College, 1979; Master of Divinity, Princeton Theological Seminary, 1982; Philosophiae Doctor, University of Chicago, 1989 (2001)

Sarah E. McKibben. Associate Professor, Irish Language and Literature; Concurrent Associate Professor, Gender Studies. Bachelor of Arts, Univ of California Berkeley, 1993; Master of Philosophy, National Univ of Ireland Dublin, 1997; Master of Arts, Cornell University, 2000; Philosophiae Doctor, ibid., 2003 (2002)


Kassie Jo McLaughlin. Assistant Librarian, Hesburgh Libraries. Bachelor of Science, Truman State University, 2012; Master of Library & Info Sci, University of Iowa, 2015 (2020)

Erin Fye McLaughlin. Associate Teaching Professor, Univ Writing Program. Bachelor of Arts, Eastern Washington University, 2003; Master of Arts, Bowling Green State University, 2007; Philosophiae Doctor, ibid., 2010 (2010)


Jessica McManus Warnell. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Saint Mary's College, 1998; Master of Arts, University of Chicago, 2000 (2008)

Collin McMillan. Associate Professor, Computer Science and Engineering. Bachelor of Science, University of Tulsa, 2007; Master of Science, Coll of William & Mary, 2009; Philosophiae Doctor, ibid., 2012 (2012)


Peter Thomas McQuillan. Associate Professor, Irish Language and Literature; Department Chair, Irish Language and Literature. Bachelor of Arts, University College Dublin, 1981; Master of Arts, ibid., 1983; Philosophiae Doctor, Harvard University, 1991 (1994)

Joyelle McSweeney. Professor, English. Bachelor of Arts (Latin), Harvard University, 1997; Master of Philosophy, University of Oxford, 1999; Master of Fine Arts, University of Iowa, 2001 (2006)

Rory M. McVeigh. Nancy Reeves Drexel Professor of Sociology; Professor, Sociology; Director of the Center for the Study of Social Movement and Social Change; Co-Editor, American Sociology Review. Bachelor of Arts, University of Arizona, 1991; Master of Arts, UNC at Chapel Hill, 1993; Doctor of Social Science, ibid., 1996 (2002)

Leo Hubbard McWilliams. Associate Teaching Professor, Dean's Office-Coll. of Engineering. Bachelor of Arts, University of Notre Dame, 1981; Bachelor of Science, ibid., 1982; Bach of Sci in Electrical Engr, ibid., 1982; M.S. Electrical Engr, ibid., 1985; Philosophiae Doctor, ibid., 1993 (2001)

Abigail R. Mechtenberg. Assistant Teaching Professor, Physics. B.S. Physics, Texas A&M University, 1997; Master of Education, Univ of California Sta Barbara, 1999; Philosophiae Doctor, University of Michigan, 2009 (2015)

David Michael Medvigy. Associate Professor, Biological Sciences; Concurrent Associate Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, Rutgers University, 1998; Philosophiae Doctor, Harvard University, 2006 (2016)

Geraldine Meehan. Associate Advising Professor, London Study Abroad. Bachelor of Arts, University College Dublin, 1978; Master of Science, ibid., 1982; Philosophiae Doctor, University of Victoria, 1995 (2006)

Collin Meissner. Advising Professor, Office of AE&L. Undergrad Study; Assistant Dean, Undergraduate Studies. Bachelor of Arts, Univ. of British Columbia, 1985; Master of Arts, University of Notre Dame, 1987; Philosophiae Doctor, ibid., 1995 (1995)

Christian Corey Melander. George and Winifred Clerk Professor of Chemistry; Professor, Chemistry and Biochemistry. B.S. Chemistry, Univ California Davis, 1994; Master of Arts, Columbia University, 1995; Master of Philosophy, ibid., 1998; Philosophiae Doctor, ibid., 1998 (2018)

Roberta Jane Melander. Research Associate Professor, Chemistry and Biochemistry. Master of Science, University of Manchester, 2004; Philosophiae Doctor, ibid., 2008 (2018)

John Christopher Mellor. Associate Professor of the Practice, Dean's Off-School of Architecture; Fellow, Institute for Real Estate. Bachelor of Architecture, University of Notre Dame, 1995; Master of Architecture, ibid., 2010 (2011)

Ivis Menes. Associate Teaching Professor, Romance Languages and Literatures. Associate in Arts, Miami-Dade Community College, 1993; Bachelor of Arts, Florida International University, 1994; Master of Arts, Loyola University Chicago, 1996 (2000)


Margaret H. Meserve. Fabiano Associate Professor of Italian Studies; Fellow, Nanovic Institute for European Studies; Associate Professor, History; Associate Dean for the Humanities and Faculty Affairs, College of Arts and Letters; Fellow, Medieval Institute. Bachelor of Arts (Latin), Harvard University, 1992; Master of Arts, The Warburg Institute, 1993; Philosophiae Doctor, ibid., 2001 (2003)


Ronald Metoyer. Associate Professor, Computer Science and Engineering; Associate Dean of Diversity and Special Initiatives, College of Engineering. Bach of Sci in Computer Eng, Univ of Southern California, 1994; Philosophiae Doctor, Georgia Institute of Technolog, 2002 (2015)

Michael John Meyers. Teaching Professor, Accountancy. Bachelor of Arts, University of Notre Dame, 1988; Master of Accountancy, Virginia Polytechnic Institute, 1993; Philosophiae Doctor, Mississippi State University, 1998 (2010)


Kerry Lynn Meyers. Associate Teaching Professor, Dean's Office-Coll. of Engineering; Assistant Dean, College of Engineering. M.S. Engineering, Oakland University, 1998; Master of Science, Purdue University, 1999 (2016)

Edwin Michael. Professor, Biological Sciences; Fellow, Kellogg Institute for International Studies. Bachelor of Science, Madras Christian College, 1982; Master of Science, ibid., 1984; Philosophiae Doctor, Imperial Coll of Science & Tec, 1990 (2011)

Nancy Alice Michael. Associate Teaching Professor, Biological Sciences; Director for Undergraduate Studies, Neuroscience and Behavior; Concurrent Assistant Professional Specialist, First Year of Studies. Bachelor of Science, Western Michigan University, 2001; Philosophiae Doctor, University of Minnesota, 2012 (2014)

John George Michel. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Tulane University, 1982; Master of Philosophy, Columbia University, 1992; Philosophiae Doctor, ibid., 1995 (2006)

Connie L. Mick. Professor of the Practice, Center for Social Concerns. Bachelor of Arts, Manchester University, 1994; Master of Arts, Boston College, 1997; Philosophiae Doctor, Loyola University Chicago, 2007 (2000)


Kenneth W. Milani. Professor, Accountancy. Bachelor of Science, Bradley University, 1962; Master of Business Admin, ibid., 1967; Philosophiae Doctor, University of Iowa, 1972 (1972)

Tijana Milenkovic. Associate Professor, Computer Science and Engineering; Frank M. Freimann Associate Professor of Engineering. Bachelor of Science, University of Sarajevo, 2005; Master of Science, Univ California Irvine, 2008; Philosophiae Doctor, ibid., 2010 (2010)


Melissa Lynn Miller. Fellow, Nanovic Institute for European Studies; Assistant Teaching Professor, German and Russian Language & Lit. Bachelor of Arts, Univ of Texas-Austin, 2006; Master of Arts, University of Wisconsin Center, 2008 (2016)

Christopher Liebtag Miller. Assistant Teaching Professor, Medieval Institute. Bachelor Degree - Unspecified, University Vermont, 2008; Bachelor of Arts, ibid., 2008; Master of Medieval Studies, Oriel College Oxford, 2009; Philosophiae Doctor, University of Toronto, 2016 (2020)

Kathleen Nanette Miller. Research Assistant Professor, Psychology. Bachelor Degree - Unspecified, Calvin College, 2007; Philosophiae Doctor, University of Notre Dame, 2013 (2013)

Paul Baron Miller. Professor, Law School; Associate Dean for International and Graduate Programs. Juris Doctor, University of Toronto, 2004; Doctor of Philosophy, ibid., 2008 (2017)

Jeffrey S. Miller. Associate Professor, Accountancy. Bachelor of Science, Ohio State University, 1982; Master of Business Admin, University of Michigan, 1988; Philosophiae Doctor, Univ of Texas-Austin, 2000 (2000)

Samuel K Miller. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Univ of IL Urbana-Champaign, 1986; Master of Business Admin, University of Michigan, 1988; Master of Science, Northwestern University, 2006 (2009)

Douglas Andrew Miller. Assistant Teaching Professor, Chemistry and Biochemistry. Bachelor of Arts, Drew University, 1981; Philosophiae Doctor, Pennsylvania St University, 1989 (1997)

Laura E Miller-Graff. Assistant Professor, Psychology. Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 2008; Master of Science, University of Michigan, 2010; Philosophiae Doctor, ibid., 2013 (2013)

Thomas William Mills. Associate Dean and Director of the Kresge Law Library; Librarian, Library Law; Director of the Kresge Law Library. Juris Doctor, Univ of IL Urbana-Champaign, 1993; Master of Education, ibid., 1998; Master of Library & Info Sci, ibid., 2003 (2017)


Marie Lynn Miranda. Professor, Applied Computational Mathematics & Statistics; Charles and Jill Fischer Provost, Office of the Provost. Bachelor of Science, Duke University, ; Master of Science, ibid.; Master of Science, ibid.; Philosophiae Doctor, Harvard University, (2020)
Philip E. Mirowski. The Carl E. Koch Professor of Economics; Professor, College of Arts and Letters. Bachelor of Arts, Michigan State University, 1973; Master of Arts, University of Michigan, 1976; Philosophiae Doctor, ibid., 1979 (1990)

Mahan Mirza. Teaching Professor, Ansari-Global Engagement w Religion; Executive Director of the Ansari Institute for Global Engagement w Religion. Bachelor of Science, Univ of Texas-Austin, 1995; Bachelor of Science, ibid., 1995; Master of Arts, Hartford Seminary, 2003; Master of Arts, ibid., 2005; Master of Philosophy, Yale University, 2005; Doctor of Philosophy, ibid., 2010 (2016)


Ann E. Mische. Associate Professor; Sociology; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Yale University, 1986; Master of Arts, The New School, 1992; Philosophiae Doctor, ibid., 1998 (2013)

Vanessa A. Miseres. Assistant Professor, Romance Languages and Literatures; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, National University of Rosario, 2004; Master of Arts, Vanderbilt University, 2006; Philosophiae Doctor, ibid., 2010 (2011)

Gerard Krzysztof Misiorek. Professor; Mathematics. Master of Science, Technical University of Warsaw, 1987; Master of Arts, University of Warsaw, 1988; Philosophiae Doctor, SUNY at Stony Brook, 1992 (1993)

H. Fred Mittelstaedt. Professor; Accountancy. Bachelor of Science, Illinois State University, 1979; Master of Science, ibid., 1982; Philosophiae Doctor, Univ of IL Urbana-Champaign, 1987 (1992)

Joel Mittleman. Assistant Professor, Sociology. Bachelor of Arts, Swarthmore College, 2009; Master of Arts, University College London, 2012; Master of Science, London School of Economics, 2013; Master of Arts, Princeton University, 2016; Philosophiae Doctor, ibid., 2019 (2019)

Pavel Nikolayevich Mnev. Assistant Professor, Mathematics. Bachelor of Physics, St Petersburg University, 2002; Philosophiae Doctor, Russian Academy of Sciences, 2008 (2016)

Bahram Moasser. Associate Teaching Professor, Chemistry and Biochemistry. B.A. Chemistry, Cornell University, 1987; Master of Science, University of Wisconsin Center, 1990; Philosophiae Doctor, University of Minnesota, 1995 (2016)

Shahriar Mobashery. Navari Family Professor of Life Sciences; Professor, Chemistry and Biochemistry. Bachelor of Science, Univ of Southern California, 1980; Bachelor of Science, ibid., 1981; Philosophiae Doctor, University of Chicago, 1985 (2003)

Christian Robert Movev. Associate Professor, Romance Languages and Literatures; Romance Languages and Literatures, Italian, Director of Undergraduate Studies. Bachelor of Arts, Harvard University, 1980; Master of Arts, Columbia University, 1989; Philosophiae Doctor, ibid., 1994 (1994)

Scott M. Monroe. The William K. Warren Foundation Professor of Psychology; Professor, Psychology. Bachelor of Arts, Saint Olaf College, 1972; Master of Arts, Southern Illinois Univ at Carb, 1975; Philosophiae Doctor, State Univ of NY-Buffalo, 1979 (2006)

Susannah Brietz Monta. Associate Professor; English; Glynn Family Honors Associate Professor of English. Bachelor of Arts, ibid., 1992; Bachelor of Science, Urbana University, 1992; Master of Arts, Univ of Wisconsin-Madison, 1993; Philosophiae Doctor, ibid., 1998 (2007)

Monica Moore. Concurrent Assistant Professorial Specialist, First Year of Studies; Assistant Librarian, Hesburgh Libraries. Bachelor of Science, Eastern Michigan Univ, 1992; Master of Library & Info Sci, Syracuse University, 2008 (2012)

Sean Michael Moore. Research Assistant Professor, Biological Sciences. Bachelor of Technology, Coll of William & Mary, 1998; Philosophiae Doctor, Oregon State University, 2010; Bachelor of Science, Virginia Polytechnic Institute, (2017)

Ebrahim Moosa. Professor, Keough School of Global Affairs; Concurrent Professor, Law School; Mirza Family Professor of Islamic Thought and Muslim Societies. Bachelor of Arts, University of Kanpur, 1982; Master of Arts, University of Cape Town, 1989; Philosophiae Doctor, ibid., 1995 (2014)


Olivier Morel. Associate Professor, Romance Languages and Literatures; Associate Professor, Film, Television, and Theatre; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University of Aix-Marseille III, 1987; Master of Arts, ibid., 1990; Philosophiae Doctor, Universite de Paris-Sorbonne, 2010 (2008)

Marisel C. Moreno. Fellow, Institute for Latino Studies; Associate Professor; Romance Languages and Literatures; The Rev. John A. O’Brien Professor of Arts and Letters. Bachelor of Arts, Univ of Pennsylvania, 1995; Philosophiae Doctor, Georgetown University, 2004 (2007)


Leslie L. Morgan. Concurrent Associate Professional Specialist, First Year of Studies; Associate Librarian, Hesburgh Libraries. Bachelor of Arts, Mercy College of Detroit, 2001; Master in Library Science, Wayne State University, 2005 (2007)

Vinicius Moris Placco. Assistant Research Professor, Physics. B.S. Physics, University of Sao Paulo, 2005; Master of Science, ibid., 2007; Philosophiae Doctor, ibid., 2010 (2015)


Ernest Morell. Coyle Professor in Literacy Education; Professor, English; Fellow, Kellogg Institute for International Studies; Joint Appointment, African and African American Studies. Bachelor of Arts, Univ of California Sta Barbara, 1993; Master of Arts, Univ of California Berkeley, 1997; Philosophiae Doctor, ibid., 2001 (2017)

Karen Marie Morris. Associate Professor of the Practice, Inst for Educational Initiatives. Bachelor of Science, Purdue University, 1986; Master of Arts, Andrews University, 1993 (2008)


Michael Harry Morris. Professor of the Practice, Keough School of Global Affairs. Bachelor of Arts, Wright State University, 1975; Master of Science, ibid., 1976; Master of Business Admin, ibid., 1978; Doctor of Philosophy, Virginia Polytechnic Institute, 1983 (2019)
Matthew Arthur Morrison. Assistant Teaching Professor, Computer Science and Engineering. Bachelor of Science in Computer Engineering, University of South Florida, 2010; Master of Engineering, ibid., 2012; Philosophiae Doctor, ibid., 2014 (2019)

Timothy James Morton. Associate Professor of the Practice, Art, Art History, and Design. Bachelor of Arts, University of Wisconsin, 2019

Dana Moss. Associate Professor, Sociology. Bachelor of Arts, Loyola University Maryland, 2004; Master of Arts, Villanova University, 2009; Master of Arts, Univ California Irvine, 2012; Philosophiae Doctor, ibid., 2016 (2020)

Kristopher Daniel Muir. Academic Director of the Master of Science in Management (MSM) program; Assistant Teaching Professor, Management & Organization; Faculty Director of the Online Master of Science in Management Program (OMSM). Bachelor of Arts, University Tennessee Knoxville, 2002; Master of Arts, University of Wisconsin Center, 2005 (2019)

Cindy Paula Muir. Associate Professor, Management & Organization. Bachelor of Science, University of Florida, 2002; Philosophiae Doctor, ibid., 2008 (2019)


Angana Mukherjee. Assistant Research Professor, Biological Sciences. Bachelor of Science, Presidency College, 1999; Philosophiae Doctor, Jawaharlal Nehru University, 2006 (2020)

Brian Paul Burton Stoyell Mulholland. Assistant Professor of the Practice, Mathematics. Bachelor of Arts, West Chester University, 2013; Philosophiae Doctor, University of Notre Dame, 2019 (2020)

Kathryn Burton Mulholland. Assistant Professor of the Practice, Mathematics. Bachelor of Science, California Polytechnic State U, 2014; Master of Science, University of Notre Dame, 2016 (2020)

Hildegund Gerlinde Muller. Associate Professor, Classics; Director, Early Christian Studies. Bachelor of Arts, University of Vienna, 1988; Philosophiae Doctor, ibid., 2004 (2008)

Marc Francois Muller. Assistant Professor, Civil & Envir Engr & Earth Sciences. Bachelor of Science & Environ Sci, University of Lausanne, 2003; Master of Engineering, ibid., 2009; Philosophiae Doctor, Univ of California Berkeley, 2015 (2017)

Michele Muller-Itten. Instructor, Department of Economics. Bachelor of Science, Federal Inst of Tech of Lausanne, 2008; Master of Science, ibid., 2010; Philosophiae Doctor, Univ of California Berkeley, 2016 (2017)

Amy C. Mulligan. Associate Professor, Irish Language and Literature. Bachelor of Arts, University of Iowa, 1997; Master of Philosophy, University of Oxford, 2000; Doctor of Philosophy, ibid., 2004 (2013)

Vincent Phillip Munoz. Concurrent Associate Professor, Law School; Associate Professor, Political Science. B.A. Economics, Claremont McKenna College, 1993; Master of Arts, Boston College, 1995; Philosophiae Doctor, Claremont Graduate School, 2001 (2009)

G. Felicitas Munzel. Professor, Program of Liberal Studies; Concurrent Professor, Philosophy. Bachelor of Arts, Mercer University Main Campus, 1983; Master of Arts, Emory University, 1988; Philosophiae Doctor, ibid., 1990 (1992)

Francesca Aran Murphy. Professor, Theology. Bachelor of Arts, University of Georgia, 1997; Master of Arts, University of Virginia, 1999; Philosophiae Doctor, Stanford University, 2006 (2011)

Tonia Hap Murphy. Teaching Professor, Accountancy. Bachelor of Arts, University of Notre Dame, 1984; Juris Doctor, University of Michigan, 1987 (1992)

David W Murphy. Associate Teaching Professor, ESTEEM Graduate Program; Assistant Provost and Executive Director, ESTEEM Graduate Program. B.A. Economics, University of Notre Dame, 1980; Master of Business Admin, Dartmouth College, 1984 (2011)


Sarah Anne Mustillo. I.A. O'Shaughnessy Dean of the College of Arts and Letters; Dean, College of Arts and Letters; Professor, Sociology. Bachelor of Arts, University of Notre Dame, 1996; Master of Arts, Duke University, 1999; Philosophiae Doctor, ibid., 2001 (2014)

Thomas Joseph Mustillo. Associate Professor, Keough School of Global Affairs; Concurrent Associate Professor, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 1991; Philosophiae Doctor, UNC at Chapel Hill, 2007 (2018)

Nathaniel Richardson Myers. Assistant Teaching Professor, University Writing Program. Bachelor of Arts, DeSales University, 2005; Undeclared, University of Aberdeen, 2006; Master Degree - Unspecified, Boston College, 2009; Philosophiae Doctor, University of Notre Dame, 2015 (2017)

Nosang Vincent Myung. Keating Crawford endowed Professor; Professor, Chemical and Biomolecular Engineering. B Eng Chem Engineering, Univ of California-Los Angeles, 1994; Master of Engineering, ibid., 1997; Philosophiae Doctor, ibid., 1998 (2020)

Jarek Bozjawski. Professor of the Practice, Center for Research Computing; Director, Center for Research Computing, Master of Science, Technical University of Poznan, 1992; Philosophiae Doctor, ibid., 2000 (2009)

Bernard Lee Naheln. Professor, Biological Sciences; Director, Eck Institute for Global Health. Bachelor of Arts, University of Notre Dame, 1975; Doctorate of Medicine, University of Arkansas Medical Sc, 1983 (2017)

Prakash Daniel Nallathamby. Assistant Professor of the Practice, Advanced Diagnostics & Therapeutics; Concurrent Assistant Professor of the Practice, Aerospace and Mechanical Engr. Bachelor of Technology, Anna University, 2003; Philosophiae Doctor, Old Dominion University, 2010 (2014)


Laurence Neill Nathan. Professor of the Practice, Joan B. Kroc Inst. for Int'l. Peace; Professor of the Practice of Mediation, Joan B. Kroc Institute for International Peace. Bachelor Business Education, University of Cape Town, 1983; Philosophiae Doctor, ibid., 2009 (2018)

Clive R. Neal. Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Science, University of Leicester, 1979; Philosophiae Doctor, University of Leeds, 1986 (1990)
Faculty

Dale Martin Nees. Advising Professor; Management & Organization; Assistant Dean of Undergraduate Studies. Bachelor of Science, U.S. Naval Academy, 1979; Master of Science, Naval Postgraduate School, 1985 (2007)

Robert Nerenberg. Professor, Civil & Environmental Engineering & Earth Sciences; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Universidad de Buenos Aires, 1990; Master of Science, Wayne State University, 1992; Philo Doctor, Northwestern University, 2003 (2004)

Svetlana Neretina. Associate Professor, Aerospace and Mechanical Engineering; Concurrent Associate Professor, Chemistry and Biochemistry. B.S. Engineering Physics, Moscow State University, 1998; Philo Doctor, McMaster University, 2007 (2016)

Scott Nestler. Associate Teaching Professor, IT; Analytics and Operations; Academic Director of the Master of Science in Business Analytics (MSBA) program. Bachelor of Science, Lehigh University, 1989; Master of Science, Naval Postgraduate School, 1999; Philo Doctor, University of Maryland University College, 2007 (2015)

Samuel Newlands. Professor, Philosophy; Co-Director, Center for Philosophy of Religion. Bachelor of Philosophy, Wake Forest University, 2000; Master of Arts, Yale University, 2003; Master of Philosophy, ibid., 2003; Philo Doctor, ibid., 2006 (2006)

Ian D Newman. Assistant Professor, English. Bachelor of Arts, University of Cambridge, 1998; Master of Arts, California State U Los Angeles, 2009; Philo Doctor, Univ. of California-Los Angeles, 2014 (2013)


Dong Quan Ngoc Nguyen. Assistant Professor, Applied Computational Mathematics & Statistics. Philo Doctor, University of Arizona, 2012 (2016)

Martin Lam Nguyen, CSC. Associate Professor, Art, Art History, and Design. Bachelor of Arts, University of Portland, 1982; Master of Divinity, University of Notre Dame, 1988; Master of Arts, Yale University, 1993; Master of Fine Arts, Univ of California Berkeley, 1995 (1995)

Briona Mary Nic Dhiamada. Thomas J. and Kathleen M. O’Donnell Professor of Irish Studies; Professor, Irish Language and Literature. Bachelor of Arts, Trinity College, 1980; Master of Arts, ibid., 1991; Philo Doctor, University College Dublin, 1995 (2008)

Liviu Nicolaescu. Professor, Mathematics. Bachelor of Science, Al I Cuza University, 1987; Philo Doctor, Michigan State University, 1994 (1998)


Sharif B Nijim. Assistant Teaching Professor, IT; Analytics and Operations. Bachelor of Business Admin., University of Notre Dame, 1995 (2007)

Jonathan Noble. Teaching Professor, VP-Assoc Prov for Internationalization. Bachelor of Arts, Coll of William & Mary, 1994; Master of Arts, Ohio State University, 1996; Philo Doctor, ibid., 2003 (2007)

Stacey Stough Noem. Associate Professor of the Practice, Theology; Concurrent Associate Professional Specialist, First Year of Studies. Bachelor of Arts, University of Notre Dame, 1998; Bachelor of Science, ibid., 1999; Master of Divinity, ibid., 2005 (2012)

Sean Patrick Nohelty. Professor of the Practice, Dean’s Office-School of Architecture; Director, Academic Director for External Relations. Bachelor of Architecture, University of Notre Dame, 1997 (2019)

Daniel Patrick Nolan. McMahon-Hank Professor of Philosophy; Professor, Philosophy. Bachelor of Arts, University of Queensland, 1992; Bachelor of Arts, ibid., 1992; Bachelor of Arts, ibid., 1993; Bachelor of Arts, ibid., 1993; Doctor of Philosophy, Australian National University, 1998 (2016)

Robert Edward Norton. Professor, German and Russian Languages and Literature; Director, VP-Associate Provost for Internationalization; Concurrent Provost, History; Concurrent Provost, Philosophy. Bachelor of Arts, Univ of California Sta Barbara, 1982; Master of Arts, Princeton University, 1985; Philo Doctor, ibid., 1988 (1998)

Michael Tivi Novick. Associate Professor, Theology; Concurrent Associate Professor, Law School; Abrams Associate Professor of Jewish Thought and Culture. Bachelor of Arts, Yale University, 1998; Juris Doctor, ibid., 2002; Master of Arts, Yeshiva University, 2003; Master of Arts, Yale University, 2006; Philo Doctor, ibid., 2008 (2008)

Rachel S Novick. Associate Professor of the Practice, Biological Sciences. Bachelor of Science, Cornell University, 1999; Master of Science, Yale University, 2002; Philo Doctor, ibid., 2008 (2008)


Frederick Chukwuka Nwanganga. Assistant Teaching Professor, IT; Analytics and Operations. Bachelor of Science, Andrews University, 2000; Master of Science, ibid., 2002; Master of Business Admin, Indiana Univ South Bend, 2011 (2009)

Kenneth Oakes. Assistant Professor, Theology. Bachelor of Arts, Point Loma Nazarene University, 2002; Bachelor of Science, ibid., 2002; Master of Theological Studies, Garrett-Evangelical Theologica, 2004; Philo Doctor, University of Aberdeen, 2009 (2016)


James Arthur O’Brien. Fellow, Institute for Real Estate; Teaching Professor, Accountancy; Director of Undergraduate Studies in the Accountancy Department. Bachelor of Business Admin., University of Notre Dame, 1988; Juris Doctor, ibid., 1993 (1997)

Christopher Stuart O’Byrne. Associate Librarian, Library Law. Bachelor of Arts, Reed College, 1998; Master of Arts, Univ of Massachusetts, 2001; Juris Doctor, Univ of Washington, 2005 (2006)

John Patrick O’Callaghan. Associate Professor, Philosophy; Director, Jacques Maritain Center. B.S. Physics, St. Norbert College, 1984; Master of Science, University of Notre Dame, 1986; Master of Arts, ibid., 1990; Philo Doctor, ibid., 1996 (2003)
Faculty

Cara Ocobock. Assistant Professor, Anthropology. Bachelor of Science, University of Michigan, 2007; Bachelor of Science, ibid., 2007; Bachelor of Science, ibid., 2007; Bachelor of Science, ibid., 2007; Master of Arts, Washington University, 2009; Philosophiae Doctor, ibid., 2014 (2019)

Paul Robert Ocobock. Concurrent Associate Professor, Gender Studies; Associate Professor, History. Bachelor of Arts, University of Michigan, 2002; Master of Philosophy, University of Oxford, 2004; Philosophiae Doctor, Princeton University, 2010 (2010)

Abigail Ruth Ocobock. Assistant Professor, Sociology; Concurrent Assistant Professor, Gender Studies. Bachelor of Arts, University of East Anglia, 2002; Master of Philosophy, University College Oxford, 2003; Philosophiae Doctor, University of Chicago, 2015 (2018)

Brian O’Conchubhair. Associate Professor, Irish Language and Literature; Fellow, Kellogg Institute for International Studies. Bachelor of Arts in Education, Mary Immaculate College, 1991; Master of Arts, University College Galway, 1995; Master of Arts, Boston College, 1997; Philosophiae Doctor, National Univ of Ireland Galwa, 2002 (2004)


David Kevin O’Connor. Professor, Philosophy; Concurrent Professor, Classics. Bachelor of Arts, University of Notre Dame, 1980; Philosophiae Doctor, Stanford University, 1985 (1985)

Paulinus I. Odoriz, CSSP. Fellow, Kellogg Institute for International Studies; Professor, Theology. Bachelor of Sacred Theology, Bigard Memorial Seminary, 1984; Master of Theology, University of Toronto, 1989; Licentiate in Sacred Theology, University of St Michaels Coll, 1990; Doctor of Theology, University of Toronto, 1993 (2000)

Raymond Offenheimer. Acting Director, McKenna Center for Human Development and Global Business; Associate Professor of the Practice, Keough School of Global Affairs; Fellow, Kellogg Institute for International Studies; Director, Notre Dame Institute for Global Development. Bachelor of Arts, University of Notre Dame, 1971; Master of Science, Cornell University, 1977 (1977)


Susan C. Ohmer. Associate Professor, Film, Television, and Theatre; Concurrent Associate Professor, American Studies; William T. and Helen Kuhn Carey Associate Professor of Modern Communication. Bachelor of Arts, Ohio State University, 1976; Bachelor of Fine Arts, ibid., 1978; Master of Arts, New York University, 1984; Philosophiae Doctor, ibid., 1997 (1998)

Rahul Chandrashekhar Oka. Concurrent Associate Research Professor, African and African American Studies; Fellow, Kellogg Institute for International Studies; Associate Research Professor, Keough School of Global Affairs; Research Associate Professor, Anthropology. Bachelor of Arts, Lawrence University, 2000; Master of Arts, Univ of Illinois-Chicago, 2001; Philosophiae Doctor, ibid., 2008 (2008)


Maria R. Olivera-Williams. Professor, Romance Languages and Literatures; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Bachelor of Arts, University Toledo, 1976; Master of Arts, Ohio State University, 1978; Philosophiae Doctor, ibid., 1983 (1982)

Mitchell Charles Olsen. Assistant Professor, Marketing. B.S. Business Administration, Indiana Univ-Bloomington, 2007; Master of Science, ibid., 2013; Philosophiae Doctor, ibid., 2016 (2016)

T. Mark Olsen. Associate Teaching Professor, Biological Sciences. Bachelor of Arts (Latin), Saint Michael’s College, 1981; Master of Science, University of Notre Dame, 1989; Philosophiae Doctor, ibid., 1994 (1994)

Patrick D. O’Malley. Research Assistant Professor, Physics. Philosophiae Doctor, Rutgers State University of NJ, 2012; Bachelor of Science, Tennessee Technological Univ, (2014)

Timothy Patrick O’Malley, II. Associate Professor of the Practice, ND Center for Liturgy. Bachelor of Arts, University of Notre Dame, 2004; Master of Theological Studies, ibid., 2006; Philosophiae Doctor, Boston College, 2010 (2004)


Atalia Omer. Fellow, Kellogg Institute for International Studies; Professor, Keough School of Global Affairs. Bachelor of Arts, Univ of California Sta Barbara, 1998; Master of Arts, Harvard University, 2002; Philosophiae Doctor, ibid., 2008 (2008)

John Odhiambo Onyango. Associate Professor, Deptn. Off-School of Architecture. Bachelor of Architecture, University of Nairobi, 1992; Master of Architecture, University of Notre Dame, 1999; Philosophiae Doctor, University of Glasgow, 2013 (2017)

Cyril J. O’Regan. The Catherine F. Huisking Professor of Theology. Professor, Theology. Bachelor of Arts, University College Dublin, 1974; Master of Arts, ibid., 1978; Master of Arts, Yale University, 1983; Master of Philosophy, ibid., 1984; Philosophiae Doctor, ibid., 1989 (1999)


James S. O’Rourke. Teaching Professor, Management & Organization. Bachelor of Business Admin., University of Notre Dame, 1968; Master of Science, Temple University, 1970; Master of Arts, University of New Mexico Main, 1973; Philosophiae Doctor, Syracuse University, 1980 (1990)

Susan Lynn Ostermann. Concurrent, Political Science; Fellow, Kellogg Institute for International Studies; Assistant Professor, Keough School of Global Affairs. Bachelor of Arts, Pomona College, 2002; Juris Doctor, Stanford University, 2006; Master of Arts, Univ of California Berkeley, 2010; Doctor of Philosophy, ibid., 2016 (2017)

To Table of Contents
Faculty


Katherine Perry Oswald. Assistant Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, University of Notre Dame, 2004; Master of Education, ibid., 2006; Master of Arts, Univ of Wisconsin-Madison, 2008; Philosophiae Doctor, ibid., 2015 (2016)

Janet Lee O’Tousa. Associate Teaching Professor, Accountancy. B.S. Biology, Univ California Irvine, 1975; Master of Business Admin, University of Notre Dame, 1988 (1988)


James Roger Otteson. John T. Ryan Jr. Professor of Business Ethics; Professor, Marketing. Bachelor of Arts, University of Notre Dame, 1990; Master of Arts, Univ of Wisconsin-Madison, 1992; Philosophiae Doctor, University of Chicago, 1997 (2020)

Timothy C. Ovaert. Professor, Aerospace and Mechanical Engineering. Bachelor of Science, Univ of IL Urbana-Champaign, 1981; Master of Engineering, Northwestern University, 1985; Philosophiae Doctor, ibid., 1989 (2000)


Alexandra Louise Oxner. Assistant Teaching Professor, Kanek Ctr for Teaching and Learning. Bachelor of Arts, University of South Florida, 2011; Master of Arts, Florida State University, 2014; Master of Arts, Vanderbilt University, 2015; Philosophiae Doctor, ibid., 2019 (2020)

Hugh (The Rev. Canon) Rowland Page, Jr. ‘. Professor, Theology; Joint Appointment, African and African American Studies; Vice President and Associate Provost for Undergraduate Affairs. Bachelor of Arts, Hampton University, 1977; Master of Divinity, General Theological Seminary, 1980; Master of Sacred Theology, ibid., 1983; Master of Arts, Harvard University, 1988; Philosophiae Doctor, ibid., 1990 (1992)

Anthony Joseph Pagliarini. Assistant Teaching Professor, Theology. Bachelor of Arts, University of Notre Dame, 2002; Master Degree - Unspecified, ibid., 2006; Master Degree - Unspecified, Pontificio Istituto Biblico, 2010; Philosophiae Doctor, University of Notre Dame, 2015; Undeclared, Pontifica Universita San Tomma, (2016)

Gerard J. Pannekoek. Associate Teaching Professor, Management & Organization. Bachelor of Arts, Netherlands Scool of Economics, 1982; Master of Business Admin, Northwestern University, 1993 (2016)


Joseph Michael Parent. Professor, Political Science. Bachelor of Arts, University of Chicago, 1999; Master of Arts, Columbia University, 2001; Master of Philosophy, ibid., 2002; Philosophiae Doctor, ibid., 2006 (2017)

James Anthony Parisi. Teaching Professor, Chemistry and Biochemistry; Associate Teaching Professor. B.S. Chemistry, SUNY College at Oswego, 2000; Philosophiae Doctor, Duke University, 2007 (2011)

Jennifer Noelle Parker. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, California State U Long Beach, 2000; Master of Arts, University of Virginia, 2002; Master of Library & Info Sci, University of Maryland Univer, 2003 (2008)

Rachel Rivers Parroquin. Teaching Professor, Romance Languages and Literatures; Teaching Professor, Center for Social Concerns. Bachelor of Arts, ibid., 1985; Bachelor of Science, Valparaiso University, 1985; Master of Education, ibid., 1990; Philosophiae Doctor, Loyola University Chicago, 2008 (2010)

Christopher Patzke. Assistant Professor, Biological Sciences. Philosophiae Doctor, Max-Delbrück-Center, 2009 (2020)

Matthew Thomas Payne. Fellow, Joan B. Kroc Institute for International Peace; Associate Professor, Film, Television, and Theatre. Bachelor of Arts, Berry College, 2000; Master of Fine Arts, Boston University, 2002; Master of Arts, Univ of Texas-Austin, 2006; Philosophiae Doctor, ibid., 2011 (2016)

Jessica Payne. Associate Professor, Psychology. Bachelor of Arts, University of San Diego, 1995; Master of Arts, Mount Holyoke College, 1999; Philosophiae Doctor, University of Arizona, 2005 (2009)


Stefano Pegasaro. Associate Professor, Finance. Bachelor of Arts, Sant’Anna Inst-Sorrento Lingue, 2012; Master of Science, Universita degli Studi di Pisa, 2014 (2020)

Jeffrey W. Peng. Associate Professor, Chemistry and Biochemistry; Concurrent Associate Professor, Physics. Bachelor of Science, Cornell University, 1987; Philosophiae Doctor, University of Michigan, 1993 (2003)


Jaime M Pensado. Associate Professor, History; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, California State U Los Angeles, 1997; Master of Arts, ibid., 2000; Master of Arts, University of Chicago, 2002; Philosophiae Doctor, ibid., 2008 (2008)

Julio Cesar Perez Hernandez. Associate Professor of the Practice, Dean’s Offc-School of Architecture. Master of Architecture, University of Havana, 1982 (2017)

Anibal Sebastian Perez-Linan. Professor, Political Science; Professor, Kessler School of Global Affairs; Fellow, Kellogg Institute for International Studies. Philosophiae Doctor, University of Notre Dame, 2001; Bachelor of Arts, Universidad Del Salvador, (2017)

Troy Alexander Perkins. Concurrent, Applied Computational Mathematics & Statistics; Associate Professor, Biological Sciences. Bachelor of Arts, University Tennessee Knoxville, 2006; Philosophiae Doctor, Univ California Davis, 2011 (2014)

Paul Clayton Perrin. Associate Professor of the Practice, Pulte Institute for Global Develpmt. Bachelor of Arts, ibid., ; Master of Public Health, Brigham Young University, ; Philosophiae Doctor, Johns Hopkins University, (2020)

Margaret Rose Pfeil. Associate Teaching Professor, Theology. Bachelor of Arts, University of Notre Dame, 1987; Master of Theological Studies, Weston School of Theology, 1994; Master of Arts, University of Notre Dame, 1997; Philosophiae Doctor, ibid., 2000 (2002)
Michael Pfrender. Professor, Biological Sciences; Associate Chair, Biological Sciences. Bachelor of Science, University of Michigan, 1988; Master of Science, ibid., 1992; Philosophiae Doctor, Univ of Oregon, 1998 (2009)

William Anthony Phillip. Associate Professor, Chemical and Biomolecular Engineering. Bachelor of Science, University of Notre Dame, 2004; Philosophiae Doctor, University of Minnesota, 2009 (2011)

David Phillips. Associate Research Professor, Department of Economics. Bachelor of Arts, Butler University, 2007; Master of Arts, Georgetown University, 2009; Doctor of Philosophy, ibid., 2012 (2016)

Lara Arielle Phillips. Research Assistant Professor, Physics. Bachelor of Science, McGill University, 1996; Philosophiae Doctor, Princeton University, 2003 (2009)

James Daniel Philpott. Professor, Political Science; Concurrent Professor, Law School; Fellow, Joan B. Kroc Institute for International Peace; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Virginia, 1989; Master of Arts, Harvard University, 1991; Philosophiae Doctor, ibid., 1996 (2001)

Alessandro Pierattini. Assistant Professor, School of Architecture. Bachelor of Architecture, Roma Tre University, 2002; Master of Architecture, ibid., 2005; Philosophiae Doctor, La Sapienza Univ. of Rome, 2015 (2015)

Richard B. Pierce, II. Associate Professor, History; Faculty Co-Director, AnBryce Scholars Initiative; Concurrent Associate Professor, American Studies. Bachelor of Arts, Valparaiso University, 1985; Master of Arts, Univ of Wisconsin-Milwaukee, 1988; Philosophiae Doctor, Indiana Univ-Bloomington, 1996 (1996)


Anne Bernadette Pilkington. Professor of the Practice, Mathematics. Bachelor of Arts, University College Dublin, 1984; Master of Arts, ibid., 1985; Philosophiae Doctor, University of Notre Dame, 1991 (2009)

Anand Pillay. William J. Hank Family Professor of Mathematics; Professor, Mathematics. Bachelor of Arts, Balliol College Oxford, 1973; Master of Science, King's College, 1974; Philosophiae Doctor, Bedford College, 1977 (2013)

Dianne M. Pinderhughes. Professor, African and American Studies; Joint Appointment Professor, Political Science; Fellow, Kellogg Institute for International Studies; Concurrent Professor, American Studies; Department Chair, African and American Studies. Bachelor of Arts, Albertus Magnus College, 1969; Master of Arts, University of Chicago, 1973; Philosophiae Doctor, ibid., 1977 (2006)

Juanita Pinzon Caicedo. Assistant Professor, Mathematics. B.S. Mathematics, Universidad de los Andes, 2007; Philosophiae Doctor, Indiana Univ-Bloomington, 2014 (2020)

Michael Edwin Pippenger. Teaching Professor, VP-Assoc Prov for Internationalizn; Vice President and Associate Provost for Internationalization. Bachelor of Arts, Carleton College; Master of Arts, Indiana Univ-Bloomington; Philosophiae Doctor, Indiana Univ-Bloomington, 2016 (2016)


Emma Catherine Planinc. Assistant Professor, Program of Liberal Studies; Concurrent Assistant Professor, Political Science. Bachelor of Arts, University of Toronto, 2009; Master of Arts, McGill University, 2011; Philosophiae Doctor, University of Toronto, 2017 (2018)


Maura Ann Policelli. Associate Professor of the Practice, Keough School of Global Affairs. Bachelor of Arts, College of the Holy Cross, 1991; Juris Doctor, Georgetown University, 2003 (2017)

Claudia Polini. Professor, Mathematics. Bachelor of Science, University of Padua, 1990; Philosophiae Doctor, Rutgers University, 1995 (2001)

Stefanos Polyzoides. Professor, School of Architecture; Dean, School of Architecture; Francis and Kathleen Rooney Dean of the School of Architecture. Bachelor of Architecture, ibid., 2000 (2001)

R. Trent Pomplun. Associate Professor, Theology. Bachelor of Arts, Rice University, 1993; Master of Arts, University of Virginia, 1996; Philosophiae Doctor, ibid., 2002 (2020)

Janice Marie Poorman. Professor of the Practice, Theology; Director of Formation and Field Education. Bachelor of Science, Southern Illinois Univ at Carb, 1976; Master of Arts, University of Notre Dame, 1988; Philosophiae Doctor, ibid., 1996 (1993)

Wolfgang Porod. Frank M. Freimuth Professor of Electrical Engineering; Professor, Electrical Engineering. Master of Science, University of Graz, 1979; Philosophiae Doctor, ibid., 1981 (1986)

Jean Porter. John A. O'Brien Professor of Theology; Professor, Theology. Bachelor of Arts, Univ of Texas-Austin, 1976; Master of Divinity, Weston School of Theology, 1980; Master of Arts, Yale University, 1981; Philosophiae Doctor, ibid., 1984 (1990)

Emilia Justyna Powell. Concurrent Associate Professor, Law School; Associate Professor, Political Science; Fellow, Kellogg Institute for International Studies. Master of Law, Copernicus University, 2001; Master of Arts, Florida State University, 2003; Philosophiae Doctor, ibid., 2006 (2011)


Joseph Michael Powers. Professor, Aerospace and Mechanical Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics. Bachelor of Science, Univ of IL Urbana-Champaign, 1983; Master of Science, ibid., 1985; Philosophiae Doctor, ibid., 1988 (1989)

Faculty

Thomas Gregory Pratt. Research Professor, Electrical Engineering. Bachelor of Science, University of Notre Dame, 1985; Master of Science, Georgia Institute of Technology, 1989; Philosophiae Doctor, ibid., 1999 (2008)

Michael Jason Pries. Associate Professor, Department of Economics; Fellow, Kellogg Institute for International Studies; Fellow, Institute for Real Estate; Associate Dean, Dean’s Offc-Coll. of Arts & Letters. Bachelor of Arts, University of Notre Dame, 1993; Philosophiae Doctor, Stanford University, 1999 (2007)


Linda Prybylszewska. Associate Professor, History; Concurrent Associate Professor, Law School. Bachelor of Arts, Northwestern University, 1984; Master of Arts, Stanford University, 1986; Philosophiae Doctor, ibid., 1989 (2005)

Sylwia Ptasinska. Associate Professor, Physics; Concurrent Associate Professor, First Year of Studies. Master of Science, Marie Curie-Sklodowska Univ, 2001; Philosophiae Doctor, University of Innsbruck, 2004 (2010)

Benjamin Pugsley. Assistant Professor, Department of Economics. B.A. Economics, Columbia University, 2004; Master Degree - Unspecified, University of Chicago, 2008; Philosophiae Doctor, ibid., 2012 (2017)

William Joseph Purcell. Associate Professor of the Practice, Center for Social Concerns. Bachelor of Arts, University of Notre Dame, 1986; Master of Divinity, ibid., 1992 (2005)

Thomas Andrew Putman. Professor, Mathematics; Notre Dame Professor of Topology. Bachelor of Mathematics, Rice University, 2002; Philosophiae Doctor, University of Chicago, 2007 (2016)

Xinxue Qu. Assistant Professor, IT, Analytics and Operations. Bachelor of Science, University of International Bu, 2012; Master of Science, Peking University, 2014; Philosophiae Doctor, Iowa State University, 2019 (2019)

Sarah Margarita Quesada. Concurrent, Romance Languages and Literatures; Assistant Professor, English. Bachelor of Arts, Hope College, 2006; Master of Arts, University of Georgia, 2010; Philosophiae Doctor, Stanford University, 2016 (2017)

Jason Quinn. Associate Research Professor, Joan B. Kroc Institute for International Peace. Bachelor of Arts, University of Memphis, 2001; Master of Arts, ibid., 2003; Philosophiae Doctor, University of North Texas, 2010 (2012)

Benjamin Radcliff. Professor, Political Science. Bachelor of Arts, Univ of IL Urbana-Champaign, 1984; Master of Arts, ibid., 1986; Philosophiae Doctor, ibid., 1991 (1991)

Andrew Joseph Radde-Gallwitz. Concurrent Associate Professor, Theology; Associate Professor, Program of Liberal Studies; Concurrent Associate Professor, Classics. Bachelor of Arts, David Lipscomb College, 2000; Master of Arts in Theo Studies, Duke University, 2002; Philosophiae Doctor, Emory University, 2007 (2014)

Marco Radeschi. Assistant Professor, Mathematics. Bachelor of Mathematics, Polytechnic Institute of Turin, 2006; M.S. Mathematics, University of Turin, 2008; Philosophiae Doctor, Univ of Pennsylvania, 2012 (2017)


Gabriel Radle. Assistant Professor, Theology. Bachelor of Philosophy, Universitate a Sri Thomas Aqui, 2005; B.A. History, Pontifical Gregorian Universit, 2006; Licentiate in Sacred Theology, Oriental Institute, 2010; Philosophiae Doctor, ibid., 2013 (2017)

Gabriel Allen Radvansky. Professor, Psychology. Bachelor of Arts, Cleveland State University, 1987; Master of Arts, Michigan State University, 1989; Philosophiae Doctor, ibid., 1992 (1993)

Evan Ralph Ragland. Assistant Professor, History. Bachelor of Science, Hillsdale College, 2003; Master of Arts, Indiana Univ-Bloomington, 2007; Philosophiae Doctor, ibid., 2012 (2015)

Claudiu Raicu. Associate Professor, Mathematics. B.S. Mathematics, University of Bucharest, 2007; Philosophiae Doctor, Univ of California Berkeley, 2011 (2014)


Ricardo Ramirez. Associate Professor, Political Science. Bachelor of Arts, Univ.of California-Los Angeles, 1995; Master of Arts, Stanford University, 2001; Philosophiae Doctor, ibid., 2002 (2010)

Corey Michael Ramsby. Professor, Air Science. Bachelor of Science, Purdue University, 1994; Master Degree - Unspecified, Air University, 2008 (2019)

Samuel Joseph Ranzilla. Associate Teaching Professor, Accountancy. Bachelor of Science, University of Detroit, 1978 (2015)

Rory Rapple. Associate Professor, History; Concurrent Associate Professor, Irish Language and Literature. Bachelor of Arts, Trinity College, 1997; Master of Philosophy, University of Cambridge, 1998; Philosophiae Doctor, ibid., 2002 (2007)

Kali P. Rath. Associate Professor, Department of Economics. Master of Arts, Utal University, 1979; Master of Arts, Johns Hopkins University, 1988; Philosophiae Doctor, ibid., 1992 (1990)

Matthew J. Ravosa. Professor, Biological Sciences; Concurrent Professor, Anthropology. Bachelor of Arts, University of Rochester, 1983; Master of Arts, Northwestern Univ. - Chicago, 1986; Philosophiae Doctor, ibid., 1989 (2011)


Jason Robert Reed. Assistant Chair, Finance; Assistant Teaching Professor, Finance. Bachelor Degree - Unspecified, Grand Valley State Univ, 2005; Bachelor of Arts, ibid., 2005; Bachelor of Science, ibid., 2005; Master of Arts, Wayne State University, 2010; Philosophiae Doctor, ibid., 2015 (2015)

Stephen J Reifenberg. Associate Teaching Professor, Keough School of Global Affairs; Concurrent Associate Professorial Specialist, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 1981; Master of Science, Boston University, 1986; Master of Public Affairs, Harvard University, 1988 (2010)
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Institution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tatiana Reinoza</td>
<td>Assistant Professor</td>
<td>Art History, and Design. Bachelor of Arts, California State University-Sacramento, 2004; Master of Arts, Univ of Texas-Austin, 2009; Philosophiae Doctor, ibid., 2016 (2019)</td>
</tr>
<tr>
<td>Emily Ann Remus</td>
<td>Assistant Professor</td>
<td>History; Concurrent Assistant Professor, Gender Studies. Bachelor of Arts, Swarthmore College, 2006; Master of Arts, University of Chicago, 2007; Philosophiae Doctor, ibid., 2014 (2015)</td>
</tr>
<tr>
<td>Robert Mark Rennie</td>
<td>Research Associate Professor</td>
<td>Aerospace and Mechanical Engineering. B.S. Engineering Physics, Queen's University, 1987; M.S. Aerospace Engr, University of Notre Dame, 1994; Philosophiae Doctor, ibid., 1996 (2004)</td>
</tr>
<tr>
<td>Terrence W. Rettig</td>
<td>Professor, Physics</td>
<td>Bachelor of Arts, Defiance College, 1968; Master of Science, Ball State University, 1970; Master of Arts, Indiana University, 1972; Philosophiae Doctor, Indiana Univ-Bloomington, 1976 (1983)</td>
</tr>
<tr>
<td>Luc Henri Reydams</td>
<td>Associate Professor of the Practice, Political Science</td>
<td>Legum Magister, University of Notre Dame, 1995; Juridiae Scientiae Doctor, ibid., 2001 (1997)</td>
</tr>
<tr>
<td>Gretchen J. Reydams-Schils</td>
<td>Professor, Program of Liberal Studies; Concurrent Professor, Theology; Concurrent Professor, Classics; Concurrent Professor, Philosophy</td>
<td>Bachelor of Arts, Katholieke Universiteit Leuven, 1987; Bachelor of Letters, ibid., 1987; Master of Arts, University of Cincinnati, 1989; Philosophiae Doctor, Univ of California Berkeley, 1994; Doctor of Philosophy, ibid., 1994; Master of Arts, University of Cincinnati, (1994)</td>
</tr>
<tr>
<td>Gabriel S. Reynolds</td>
<td>Professor, Theology</td>
<td>Jerome J. Crowley and Rosaleen G. Crowley Professor of Theology. Bachelor of Arts, Columbia University, 1994; Master of Arts, Yale University, 2001; Master of Philosophy, ibid., 2001; Philosophiae Doctor, ibid., 2003 (2003)</td>
</tr>
<tr>
<td>Robin Francis Rhodes</td>
<td>Associate Professor, Art, Art History, and Design; Concurrent Associate Professor, School of Architecture; Fellow, Nanovic Institute for European Studies</td>
<td>Bachelor of Arts, UNC at Chapel Hill, 1974; Philosophiae Doctor, ibid., 1984 (1996)</td>
</tr>
<tr>
<td>Alison Rice</td>
<td>Associate Professor, Romance Languages and Literatures; Concurrent Associate Professor, Gender Studies</td>
<td>Fellow, Joan B. Kroc Institute for International Peace; Dr. Scholl Associate Professor of Romance Languages and Literatures, Bachelor of Arts, Loma Linda University La Sierra, 1996; Master of Arts, California State University Los Angeles, 1999; Philosophiae Doctor, Univ of California-Los Angeles, 2003 (2005)</td>
</tr>
<tr>
<td>Karen Ellen Richman</td>
<td>Teaching Professor, Institute for Latino Studies; Director, Border and Inter-American Affairs, Institute for Latino Studies; Concurrent Teaching Professor, Romance Languages and Literatures; Concurrent Teaching Professor, Anthropology.</td>
<td>Bachelor of Arts, Wesleyan University, 1978; Master of Arts, University of Virginia, 1981; Philosophiae Doctor, ibid., 1992 (2007)</td>
</tr>
<tr>
<td>David Richter</td>
<td>Associate Professor, Civil &amp; Environmental Engineering &amp; Earth Sciences.</td>
<td>Bachelor of Science, Univ of Massachusetts, 2006; M.S. Mechanical Engr, Stanford University, 2007; Philosophiae Doctor, ibid., 2011 (2013)</td>
</tr>
<tr>
<td>Eric Brendan Riedl</td>
<td>Assistant Professor, Mathematics</td>
<td>Bachelor of Science, University of Notre Dame, 2010; Philosophiae Doctor, Harvard University, 2015 (2018)</td>
</tr>
<tr>
<td>Kenneth F. Ripple</td>
<td>Professor, Law School</td>
<td>Bachelor of Arts, Fordham University, 1965; Juris Doctor, University of Virginia, 1968; Master of Law, George Washington University, 1972 (1977)</td>
</tr>
<tr>
<td>Bryan K. Ritchie</td>
<td>Vice President and Associate Provost for Innovation; Teaching Professor, Management &amp; Organization.</td>
<td>Bachelor of Arts, Univ of Nevada-Las Vegas, 1990; Philosophiae Doctor, Emory University, 2001; Master of Business Admin, Brigham Young University, (2017)</td>
</tr>
<tr>
<td>Daniel John Robertson</td>
<td>Associate Research Professor, Physics.</td>
<td>Master of Science, University of Surrey, 2003; Master of Science, University of Notre Dame, 2005; Philosophiae Doctor, ibid., 2010 (2010)</td>
</tr>
<tr>
<td>Denis Jean-Jacques Robichaud</td>
<td>Concurrent Associate Professor, Romance Languages and Literatures; Associate Professor, Program of Liberal Studies</td>
<td>Bachelor of Arts, Concordia University, 2005; Master of Arts, Johns Hopkins University, 2010; Master of Arts, ibid., 2010; Master of Arts, ibid., 2010; Master of Arts, ibid., 2011 (2011)</td>
</tr>
<tr>
<td>Jennifer Diane Robichaud</td>
<td>Associate Teaching Professor, Biological Sciences.</td>
<td>Bachelor of Arts, Coll of St. Scholastica, 1995; Master of Science, University of Georgia, 1997 (2009)</td>
</tr>
<tr>
<td>Mark Daniel Robison</td>
<td>Assistant Librarian, Heubner Libraries.</td>
<td>B.A. History, Purdue University, 2010; Master in Library Science, Indiana Univ-Bloomington, 2012 (2018)</td>
</tr>
<tr>
<td>Francisco Eduardo Robles</td>
<td>Concurrent, Gender Studies; Assistant Professor, English</td>
<td>Bachelor of Arts, Washington University, 2009; Master of Arts, Princeton University, 2012; Philosophiae Doctor, ibid., 2016 (2017)</td>
</tr>
<tr>
<td>Pablo D Robles Granda</td>
<td>Research Assistant Professor, Computer Science and Engineering.</td>
<td>Master of Engineering, Southern Illinois Univ at Carb, 2011; Philosophiae Doctor, Purdue University, 2017; Bach of Sci in Computer Sci, University of Cuenca, 2055 (2017)</td>
</tr>
<tr>
<td>Adrian V. Rocha</td>
<td>Associate Professor, Biological Sciences; Concurrent Associate Professor, Civil &amp; Environmental Engineering &amp; Earth Sciences.</td>
<td>Bachelor of Science, CA State Univ. Monterey Bay, 2001; Master of Science, Ohio State University, 2003; Philosophiae Doctor, Univ California Irvine, 2008 (2012)</td>
</tr>
<tr>
<td>Mark William Roche</td>
<td>Rev. Edmund Joyce, C.S.C., Professor of German Language and Literature; Professor, German and Russian Languages and Literature; Concurrent Professor, Philosophy.</td>
<td>Bachelor of Arts, Williams College, 1978; Master of Arts, Eberhard Karl Univ of Tübingen, 1980; Philosophiae Doctor, Princeton University, 1984 (1996)</td>
</tr>
<tr>
<td>Daniel Blake Roebber</td>
<td>Associate Professor, Philosophy.</td>
<td>Bachelor of Arts, Wheaton College, 2002; Master of Arts, Northern Illinois Univ, 2008; Philosophiae Doctor, Rutgers State University of NJ, 2013 (2013)</td>
</tr>
<tr>
<td>Ryan K. Roeder</td>
<td>Professor, Aerospace and Mechanical Engineering.</td>
<td>Bachelor of Science, Purdue University, 1994; Philosophiae Doctor, ibid., 1999 (2001)</td>
</tr>
<tr>
<td>Jason Rohr</td>
<td>Ludmilla F., Stephen J., and Robert T. Galla College Professor of Biological Sciences; Professor, Biological Sciences; Department Chair, Biological Sciences.</td>
<td>Bachelor of Social Science, State Univ of NY–Binghamton, 1996; Master of Arts, ibid., 1997; Doctorate Degree, ibid., 2002 (2019)</td>
</tr>
<tr>
<td>Kimberly Ann Rollings</td>
<td>Concurrent, Psychology; Assistant Professor, Dean’s Off-School of Architecture.</td>
<td>Bachelor of Architecture, University of Notre Dame, 2003; Master of Science, Cornell University, 2010; Philosophiae Doctor, ibid., 2013 (2013)</td>
</tr>
</tbody>
</table>
Jeanne Romero-Severson. Professor, Biological Sciences. Bachelor of Science, Univ of Wisconsin-Madison, 1974; Master of Science, ibid., 1975; Philosophiae Doctor, ibid., 1984 (1997)

Sebastian Rosato. Associate Professor, Political Science. Bachelor of Arts, University of Cambridge, 1994; Master of Philosophy, University of Oxford, 1996; Master of Arts, University of Chicago, 2000; Philosophiae Doctor, ibid., 2006 (2006)

Susan Heather Rosato. Associate Teaching Professor, Political Science. B.A. Economics, Colgate University, 1996; Master of Arts, University of Chicago, 1998; Philosophiae Doctor, ibid., 2014 (2007)

Robert Jason Rosenbaum. Huisking Foundation, Inc. Assistant Professor of Applied and Computational Mathematics and Statistics; Associate Professor, Applied Computational Math & Stats. Bachelor of Science, University of Houston, 2006; M.S. Mathematics, ibid., 2008; Philosophiae Doctor, ibid., 2011 (2014)

Joseph Rosenberg. Fellow, Nanovic Institute for European Studies; Assistant Professor, Program of Liberal Studies; Assistant Professor of the Practice; Program of Liberal Studies, Director of Undergraduate Studies. Bachelor of Arts, Dalhousie University Halifax, 2001; Master of Arts, Queen's University, 2002; Philosophiae Doctor, Trinity Hall Cambridge, 2008 (2011)


Daniela Rovida. Assistant Librarian, Hesburgh Libraries. B.S. Economics, University of Pavia, 1992; M.S. Library Science, University of Arizona, 2014 (2020)

Ingrid Drake Rowland. Professor, School of Architecture; Joint Appointment, Professor; Concurrent Professor, Art, Art History and Design. Bachelor of Arts, Pomona College, 1974; Master of Arts, Bryn Mawr College, 1976; Philosophiae Doctor, ibid., 1980 (2005)

Kelly Jo Rubey. Assistant Teaching Professor, Management & Organization. B.S. Business Administration, University Wisconsin La Crosse, 2012; Master of Business Admin, University of Notre Dame, 2016 (2020)

Hannah Marie Rubin. Assistant Professor, Philosophy. Bachelor Degree - Unspecified, Univ of Missouri-Columbia, 2011; Master of Arts, Univ California Irvine, 2015; Philosophiae Doctor, ibid., 2017 (2018)

Randal C. Ruchti. Professor, Physics. Bachelor of Science, Univ of Wisconsin-Madison, 1968; Master of Science, Univ of IL Urbana-Champaign, 1970; Philosophiae Doctor, Michigan State University, 1973 (1977)

Kristin Joy Rudenga. Associate Teaching Professor, Kenan Cr for Teaching and Learning; Concurrent Associate Teaching Professor, First Year of Studies; Associate Director, Kenan Center for Teaching and Learning. Bachelor of Arts, ibid., 2005; Bachelor of Science, Purdue University, 2005; Master of Philosophy, Yale University, 2008; Philosophiae Doctor, ibid., 2012 (2014)


Jason Michael Ruiz. Associate Professor, American Studies; Concurrent Associate Professor, Gender Studies; Concurrent Associate Professor, Film, Television, and Theatre; Concurrent Associate Professor, Film, Television, and Theatre; Department Chair, American Studies. Bachelor of Arts, University of Minnesota, 2001; Philosophiae Doctor, ibid., 2008 (2008)

Paul Francis Rumbach. Assistant Teaching Professor, Aerospace and Mechanical Engr. Bachelor of Science, Indiana Univ-Bloomington, 2010; Philosophiae Doctor, University of Notre Dame, 2016 (2016)


Nicholas Vincent Russo. Advising Professor, Office of Ad L Undergrad Study; Director of Advising; Assistant Dean, Office of Ad L Undergrad Studies. Bachelor of Arts, University of Virginia, 1998; Master of Arts, University of Notre Dame, 2002; Philosophiae Doctor, ibid., 2009 (2011)

Ardea Caviggiola Russo. Assistant Advising Professor, Center for University Advising. Bachelor of Science, Univ of Wisconsin-Madison, 1998; Master of Theological Studies, University of Notre Dame, 2001; Doctor of Philosophy, ibid., 2009 (2017)

Maura Anne Ryan. Associate Professor, Theology; Associate Provost and Vice President for Faculty Affairs. Bachelor of Arts, St. Bonaventure University, 1979; Master of Arts, Boston College, 1987; Master of Philosophy, Yale University, 1990; Philosophiae Doctor, ibid., 1993 (1993)


Philip J. Sakimoto. Advising Professor, Center for University Advising. Bachelor of Arts, Pomona College, 1976; Master of Arts, Univ of Southern California, 1979; Philosophiae Doctor, ibid., 1985 (2005)

Samantha Lynn Salden Teach. Associate Professor of the Practice, School of Architecture; Fellow, Institute for Real Estate; Assistant Dean of Graduate Studies, School of Architecture. Bachelor of Architecture, University of Notre Dame, 2002; M of Arch Design & Urbanism, ibid., 2008 (2008)

Kevin John Sandberg, CSC. The Leo and Arlene Hawk Executive Director, Center for Social Concerns; Assistant Teaching Professor, Center for Social Concerns; Concurrent Assistant Teaching Professor, Theology. Bachelor of Arts, University of Notre Dame, 1988; Master of Arts, Jesuit School of Theology, 1994; Master of Divinity, University of Notre Dame, 2004; Philosophiae Doctor, Fordham University, 2014 (2014)


Felipe Hiram Santiago Tirado. Assistant Professor, Biological Sciences. Bachelor of Science, University of Puerto Rico Maya, 2003; Doctor of Science, Cornell University, 2011 (2018)


Jennifer Lyn Schaefer. Assistant Professor, Chemical and Biomolecular Engineering. Master of Engineering, Widener University, 2008; Bachelor of Science, ibid., 2008; Philosophiae Doctor, Cornell University, 2014 (2015)


Zachary Thomas Schafer. Associate Professor, Biological Sciences; Coleman Foundation Associate Professor of Cancer Biology; Assistant Chair, Biological Sciences. Bachelor of Science, University of Notre Dame, 2001; Philosophiae Doctor, Duke University, 2006 (2009)


Luis Schiumerini. Assistant Professor, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, Universidad Torcuato Di Tella, 2004; Master of Philosophy, Yale University, 2011; Philosophiae Doctor, ibid., 2015 (2017)

Catherine M. Schlegel. Associate Professor, Classics. Bachelor of Arts, University of Chicago, 1978; Master of Arts, ibid., 1983; Philosophiae Doctor, Univ.of California-Los Angeles, 1994 (1996)

Daniel Schlosberg. Fellow, Nanovic Institute for European Studies; Associate Professor of the Practice, Music. Bachelor of Arts, Johns Hopkins University, 2000; Bachelor of Music, Peabody Inst. of John Hopkins, 2000; Master of Music, ibid., 2001; Doctor of Musical Arts, SUNY at Stony Brook, 2005 (2005)

James Patrick Schmiedeler. Professor, Aerospace and Mechanical Engineering; Associate Chair, Aerospace and Mechanical Engineering. Bachelor of Science, University of Notre Dame, 1996; Master of Science, Ohio State University, 1998; Philosophiae Doctor, ibid., 2001 (2008)

Julia Agnes Schneider. Assistant Librarian, Hesburgh Libraries. Master of Arts, Saint Louis University, 2001; Master of Medieval Studies, University of Notre Dame, 2003; Doctor of Philosophy, ibid., 2011; Master in Library Science, University of Illinois Medical, 2016 (2012)

William Frederich Schneider. The H. Clifford and Evelyn A. Brouy Professor of Engineering; Professor, Chemical and Biomolecular Engineering; Concurrent Professor, Chemistry and Biochemistry. B.S. Chemistry, Univ of Michigan-Dearborn, 1986; Philosophiae Doctor, Ohio State University, 1991 (2004)

Ilaria Maria Franca Schnyder von Wartensee. Assistant Research Professor, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Philosophiae Doctor, Bocconi University, 2009 (2014)


Christopher John Schommer-Pries. Assistant Professor, Mathematics. Master Degree - Unspecified, Harvey Mudd College, 2003; Philosophiae Doctor, Univ of California Berkeley, 2009 (2016)

Jeffrey S. Schoeny. Professor, Biological Sciences. Bachelor of Science, Southeast Missouri St Univ, 1985; Philosophiae Doctor, Univ of Texas-San Antonio, 1991 (1998)

Michael John Schrefler. Associate Professor, Art, Art History, and Design. Bachelor of Arts, University of Virginia, 1989; Master of Arts, Arizona State University, 1994; Philosophiae Doctor, University of Chicago, 2000 (2015)

Paul H. Schultz. John W. and Maude Clarke Professor of Finance; Professor, Finance; Fellow, Institute for Real Estate. Bachelor of Arts, Macalester College, 1978; Master of Business Admin, University of Chicago, 1985; Philosophiae Doctor, ibid., 1988 (1998)

Mark Richard Schurr. Professor, Anthropology; Department Chair, Anthropology. Bachelor of Science, Purdue University, 1977; Philosophiae Doctor, Indiana Univ-Bloomington, 1989 (1991)

Siiri Sativa Scott. Teaching Professor, Film, Television, and Theatre. Bachelor of Arts, Saint Mary’s College, 1991; Master of Fine Arts, DePaul University, 1994 (1999)

Roy William Scranton. Fellow, Joan B. Kroc Institute for International Peace; Associate Professor, English. Bachelor of Arts, The New School, 2008; Master of Arts, ibid., 2010; Philosophiae Doctor, Princeton University, 2016 (2016)

Timothy Richard Scully, CSC. Professor, Political Science; Director Emeritus of the Institute for Educational Initiatives; Fellow, Kellogg Institute for International Studies. Bachelor of Arts, University of Notre Dame, 1976; Master of Divinity, ibid., 1979; Master of Arts, Univ of California Berkeley, 1985; Philosophiae Doctor, ibid., 1989 (1999)

Alan C. Seabaugh. Professor, Electrical Engineering; Frank M. Freimann Chaired Professor of Electrical Engineering; Director, ND NANO. Bach of Sci in Electrical Engr, University of Virginia, 1977; M.S. Electrical Engr, ibid., 1979; Philosophiae Doctor, ibid., 1985 (1999)

Joshua W Seachris. Assistant Teaching Professor, Philosophy. Associate in Arts, Hutchinson Community Junior Co, 1996; Bachelor of Science, Kansas State University, 1998; Master of Arts, Southern Evangelical Seminary, 2002; Master of Arts, University of Oklahoma, 2006; Philosophiae Doctor, ibid., 2010 (2012)

James Herbert Seckinger. Professor, Law School. Bachelor of Science, Saint John’s University, 1964; Juris Doctor, University of Notre Dame, 1968; Master of Science, Vanderbilt University, 1968 (1974)

Clemens Sedmak. Professor, Kneugh School of Global Affairs; Interim Director, Nanovic Inst for European Studies; Fellow, Kellogg Institute for International Studies; Concurrent Professor, Center for Social Concerns; Concurrent Professor, Theology; Fellow, Nanovic Institute for European Studies. Philosophiae Doctor, University of Innsbruck, 1994 (2015)
Michael James Seelinger. Dunn Family Teaching Professor of Engineering; Teaching Professor, Dean's Office-Coll. of Engineering. Bach of Sci in Mech Engr, University of Notre Dame, 1994; Master of Science, ibid., 1996; Philosophiae Doctor, ibid., 1999 (2009)  

James A. Seida. Associate Professor, Accountancy. Bachelor of Science, Arizona State University, 1989; Master of Science, Univ of IL Urbana-Champaign, 1990; Philosophiae Doctor, Texas A&M University, 1997 (2001)  

Steven Wayne Semes. Professor, School of Architecture. Bachelor of Science, University of Virginia, 1975; Master of Architecture, Columbia University, 1980 (2005)  

Satyajyoti Senapati. Research Assistant Professor, Chemical and Biomolecular Engineering. Philosophiae Doctor, University of Pune, 2006 (2006)  

Tiziana Serafini. Associate Teaching Professor, Romance Languages and Literatures. Master of Arts, Universita de Roma LaSapienza, 1995; Master of Arts, Univ of Southern California, 2004; Philosophiae Doctor, ibid., 2010; Master of Arts, Univ. Ca’Foscari Di Venezia, 2015 (2016)  

Anthony S. Serianni. Professor, Chemistry and Biochemistry. Bachelor of Science, Albright College, 1975; Philosophiae Doctor, Michigan State University, 1980 (1982)  

Arnaldo Luis Serrano. Assistant Professor; Chemistry and Biochemistry. Bachelor of Arts, Rutgers State University of NJ, 2007; Philosophiae Doctor, Univ of Pennsylvania, 2013 (2017)  

Slavi Cristov Sevov. Professor, Chemistry and Biochemistry. Bachelor of Science, University of Sofia, 1983; Master of Science, ibid., 1985; Philosophiae Doctor, Iowa State University, 1993 (1995)  

Alexander Shapiro. Assistant Professor, Mathematics. Master of Science, Moscow State University, 2008; Philosophiae Doctor, Univ of California Berkeley, 2016 (2020)  

Mei-Chi Shaw. Professor, Mathematics. Bachelor of Science, National Taiwan University, 1977; Master of Science, Princeton University, 1978; Philosophiae Doctor, ibid., 1981 (1987)  

Dean Shepherd. Ray and Milann Siefried Professor of Entrepreneurship; Professor, Management & Organization. Master of Business Admin, Bond University, 1992; Philosophiae Doctor, ibid., 1997 (2017)  

Susan Guise Sheridan. Associate Professor, Anthropology. Bachelor of Arts, University of Maryland, 1984; Master of Arts, ibid., 1986; Philosophiae Doctor, Univ of Colorado-Boulder, 1992 (1992)  

Yiyu Shi. Associate Professor, Computer Science and Engineering. Philosophiae Doctor, Univ. of California-Los Angeles, 2009; Bachelor of Engineering, Tsinghua University, 2015 (2015)  

Christopher J. Shields. Professor, Philosophy; George N. Shuster Chair in Philosophy; Concurrent Professor, Classics. Bachelor of Arts, Bowling Green State University, 1979; Master of Arts, ibid., 1981; Master of Arts, Cornell University, 1984; Philosophiae Doctor, ibid., 1986 (2014)  

Scott Shim. Professor, Art, Art History, and Design. Bachelor of Fine Arts, Univ of Illinois-Chicago, 1995; Master of Arts, Ohio State University, 1997 (2016)  

John Junhee Shim. Assistant Professor. Bachelor of Science, Univ of IL Urbana-Champaign, 2006; Master of Business Admin, University of Chicago, 2012 (2019)  

Sophie Anne Shive. Associate Professor, Finance. Bachelor of Science, Cornell University, 1998; Master of Science, ibid., 2000; Philosophiae Doctor, University of Michigan, 2006 (2005)  

Nikhil Menon Shivram. Assistant Professor, History. Bachelor of Arts, University of Delhi, 2007; Master of Arts, ibid., 2009; Master of Philosophy, Jawaharlal Nehru University, 2011; Master of Arts, Princeton University, 2013; Philosophiae Doctor, ibid., 2017 (2017)  

Sarah Elizabeth Shortall. Fellow, Nanovic Institute for European Studies; Assistant Professor, History. Bachelor of Arts, Queen's University, 2007; Master of Arts, Harvard University, 2010; Doctor of Philosophy, ibid., 2015 (2017)  

Gina Venice Shropshire. Concurrent Assistant Professorial Specialist, First Year of Studies; Assistant Advising Professor, Management & Organization. Bachelor of Arts, University of Notre Dame, 1983; Master of Arts, Purdue University, 1993; Philosophiae Doctor, ibid., 1999 (1998)  

Joshua Shrot. Associate Professor, Civil & Environmental Engineering & Earth Sciences; Concurrent Associate Professor, Biological Sciences. Bachelor of Science, Northwestern University, 1994; Master of Science, Marquette University, 1998; Philosophiae Doctor, University of Iowa, 2002 (2007)  

Jessica Shumake. Assistant Teaching Professor, Univ Writing Program. Bachelor of Arts, Christopher Newport University, 1999; Master of Arts, University of Windsor, 2000; Philosophiae Doctor, University of Arizona, 2013 (2018)  

Fiorella Jazmin Sierra. Assistant Professor, Political Science; Fellow, Kellogg Institute for International Studies. Bachelor Degree - Unspecified, Universidad Torcuato Di Tella, 2008; Master Degree - Unspecified, Brown University, 2011; Philosophiae Doctor, ibid., 2015 (2017)  


Anna Maria Simon. Associate Professor, Physics. Master of Science, Jagiellonian University, 2006; Philosophiae Doctor, ibid., 2010 (2014)  

Antonio Simonetti. Associate Professor, Civil & Environmental Engineering & Earth Sciences; Concurrent Associate Professor, First Year of Studies. Bachelor of Science, McGill University, 1987; Master of Science, ibid., 1989; Philosophiae Doctor, Carleton University Ottawa, 1994 (2008)  

Stefanie Simonetti. Associate Teaching Professor, Civil & Envr Engr & Earth Sciences. Bachelor of Science, Eberhard Karl Univ of Tubingen, 1993; Master of Science, ibid., 1996; Philosophiae Doctor, McGill University, 2002 (2011)  

Marcy Lynn Simons. Associate Librarian, Hesburgh Libraries. Bachelor of Arts, Indiana Univ South Bend, 1997; Master Degree - Unspecified, ibid., 2002; Master in Library Science, Indiana-Purdue Univ Indpls, 2008 (1988)  

Eric Russell Sims. Michael P. Grace II Associate Professor of Economics; Professor, Department of Economics; Department Chair, Department of Economics; Fellow, Institute for Real Estate. Bachelor of Arts, Trinity University, 2003; Master of Arts, University of Michigan, 2006; Philosophiae Doctor, ibid., 2009 (2009)  

Faculty


Geoffrey Henry Siwo. Research Assistant Professor, Biological Sciences. Bachelor Degree - Unspecified, Egerton University, 2005; Master of Science, ibid., 2008; Philosophiae Doctor, University of Notre Dame, 2014 (2017)

Scott Thomas Small. Research Assistant Professor, Biological Sciences. Bachelor of Science, University of Wisconsin-Steven, 2002; Philosophiae Doctor, University of Georgia, 2009 (2016)

Roxana Smarandache. Professor, Mathematics; Joint Appointment, Electrical Engineering. Bachelor of Science, University of Bucharest, 1996; Master of Science, University of Notre Dame, 1997; Philosophiae Doctor, ibid., 2001 (2012)


David Alan Smith. Professor, Psychology. Bachelor of Arts, University of Minnesota, 1983; Master of Arts, ibid., 1986; Philosophiae Doctor, SUNY at Stony Brook, 1991 (1997)


Brian James Smith. Concurrent Associate Teaching Professor, School of Architecture; Associate Teaching Professor, Civil & Env Engr & Earth Sciences. Bach of Sci in Civil Engr, University of Notre Dame, 2001; M.S. Civil Engr, Georgia Institute of Technolog, 2002; Philosophiae Doctor, University of Notre Dame, 2013 (2012)


Cody Jean Smith. Elizabeth and Michael Gallagher Family Assistant Professor in Adult Stem Cell Research; Assistant Professor, Biological Sciences. B.S. Biology, Mercyhurst College, 2007; Philosophiae Doctor, Vanderbilt University, 2012 (2016)

Bradley Dennis Smith. Emil T. Hofsman Professor of Science; Professor, Chemistry and Biochemistry, Director, ND Integrated Imaging Facility. Bachelor of Science, University of Melbourne, 1983; Philosophiae Doctor, Pennsylvania State University, 1988 (1991)


Michelle Kimberly Smith Ware. Associate Advising Professor, Center for University Advising. Bachelor of Science, Xavier University, 2002; Master of Science, Springfield College, 2004 (2011)

Cheryl K. Snay. Assistant Professor of the Practice, Snite Museum; Curator of European Art. Bachelor of Arts, Oakland University, 1987; Master of Arts, Michigan State University, 1991; Philosophiae Doctor, Pennsylvania State University, 2000 (2010)

Orlando Carter Snead. Professor, Law School; William P. and Hazel B. White Director of the Center for Ethics and Culture; Director, Center for Ethics and Culture, Concurrent Professor, Political Science. Bachelor of Arts, Saint Johns College Main Campu, 1996; Juris Doctor, Georgetown University. 1999 (2005)

Gregory Lynn Snider. Professor, Electrical Engineering; Department Chair, Electrical Engineering. Bachelor of Science, Calif St Poly U Pomona, 1983; Master of Science, Univ of California Sta Barbara, 1987; Philosophiae Doctor, ibid., 1991 (1994)

Yasmin Hana Solomonescu. Associate Professor, English. Bachelor of Science, Carleton University Ottwa, 2001; Master of Philosophy, University of Cambridge, 2002; Philosophiae Doctor, ibid., 2007 (2011)


Yoon Seock Son. Assistant Professor, IT; Analytics and Operations. Bachelor of Science, Korea Advanced Institute of Sc, 2014; Master of Science, ibid., 2015; Philosophiae Doctor, ibid., 2020 (2020)

Cesar Sosa Padilla Araujo. Rev. Thomas J. McDonagh, C.S.C., Associate Professor of Economics; Assistant Professor, Department of Economics. B.A. Economics, National University of Tucuman, 2005; Master of Arts, University of Maryland Univers, 2008; Doctor of Philosophy, University of Maryland, 2012 (2016)

Elyse Deeb Speaks. Associate Professor of the Practice, Art, Art History, and Design. Bachelor of Arts, University of Notre Dame, 1997; Master of Arts, Brown University, 2001; Philosophiae Doctor, ibid., 2005 (2013)

Jeffrey Joseph Speaks. Professor, Philosophy; Department Chair, Philosophy. Bachelor of Arts, University of Notre Dame, 1997; Philosophiae Doctor, Princeton University, 2003 (2006)

Joshua Specht. Assistant Professor, History. Bachelor of Arts, Coll of William & Mary, 2007; Master of Arts, Harvard University, 2010; Philosophiae Doctor, ibid., 2014 (2020)

Forrest Rule Spence. Assistant Professor of the Practice, Department of Economics. Bachelor of Science, Univ of South Carolina, 2009; Philosophiae Doctor, UNC at Chapel Hill, 2015 (2015)

D. Katherine Spiess. Associate Professor, Finance. Philosophiae Doctor, Univ of Missouri-Columbia, 1991; Bachelor of Science, ibid., 1994 (1991)


Jeffrey Vincent Spoonhower. Assistant Professor, Film, Television, and Theatre. Bachelor of Arts, University of Notre Dame, 1999; Master of Fine Arts, Rochester Inst of Technology, 2002 (2012)

Jason Andrew Springs. Associate Professor, Keough School of Global Affairs. Bachelor of Arts, Georgetown University, 1995; Master of Arts, Baylor University, 1996; Master of Divinity, Princeton Theological Seminary, 2000; Philosophiae Doctor, Harvard University, 2005 (2008)

Susan Monica St. Ville. Associate Teaching Professor, Joan B. Kroc Inst for Int'l Peace; Director, MGA Peace Studies Concentration, Keough School of Global Affairs. Bachelor of Arts, University of Notre Dame, 1985; Master of Arts, University of Chicago, 1986; Philosophiae Doctor, ibid., 1996 (2008)
Mary Sharon Stack. Kleiderer-Pezold Professor of Biochemistry; Professor, Chemistry and Biochemistry; Concurrent Professor, Biological Sciences. Bachelor of Science, Clemson University, 1981; Master of Science, East Tennessee State University, 1985; Philosophiae Doctor, University of Louisville, 1989 (2011)

John W. Stamper. Professor, School of Architecture; Fellow, Institute for Real Estate; Associate Dean, School of Architecture. Bachelor of Science, Univ of IL Urbana-Champaign, 1973; Master of Architecture, ibid., 1975; Master of Arts, Williams College, 1977; Philosophiae Doctor, Northwestern University, 1985 (1984)


Zachary Ronald Stangebye. Assistant Professor, Department of Economics. Bachelor of Science, University of Michigan, 2010; Philosophiae Doctor, Univ of Pennsylvania, 2015 (2015)


Thomas A. Stapleford. Associate Professor, Program of Liberal Studies; Department Chair, Program of Liberal Studies. Bach of Sci in Mech Eng, ibid., 1997; Bachelor of Arts, University of Delaware, 1997; M.S. Engineering, University of Edinburgh, 1998; Philosophiae Doctor, Harvard University, 2003 (2003)


Amy Stark. Director, DNA Learning Center; Associate Professor of the Practice, Biological Sciences. B.S. Biology, Valparaiso University, 2006; Philosophiae Doctor, University of Chicago, 2011 (2014)

Edward Joseph Stech. Research Professor, Physics; Professor of the Practice. Bachelor of Science, University of Notre Dame, 1995; Master of Science, ibid., 2001; Philosophiae Doctor, ibid., 2004 (2003)


Marcus Stephens. Associate Professor of the Practice, Film, Television, and Theatre. Bachelor of Arts, Southeast Missouri St Univ, 2004; Master of Fine Arts, Northwestern University, 2006 (2007)

James P. Sterba. Professor, Philosophy. Bachelor of Arts, La Salle University, 1966; Master of Arts, University of Pittsburgh, 1972; Philosophiae Doctor, ibid., 1973 (1973)

Christopher L. Stevens. Assistant Teaching Professor, Management & Organization. B.A. Economics, University of Notre Dame, 1974 (2017)

Robert L. Stevenson. Professor, Electrical Engineering. B Electrical Engineering, University of Delaware, 1986; Philosophiae Doctor, Purdue University, 1990 (1990)

John Stiver. Associate Teaching Professor, Finance. Bachelor of Arts, State Univ of NY-Buffalo, 1993; Master of Arts, University of Rochester, 1997; Doctorate Degree, ibid., 2000 (2004)

Thomas L. Stober. Associate Professor, Accountancy; Concurrent Associate Professor, First Year of Studies. B.S. Business Administration, Ohio State University, 1974; Master of Business Admin, University of Minnesota, 1975; Philosophiae Doctor, University of Chicago, 1983 (1995)

Nina Jasmin Stoeckel. Assistant Clinical Professor, Psychology. Bachelor of Science, University of Konstanz, 1999; Master of Science, ibid., 2004; Philosophiae Doctor, Syracuse University, 2010 (2020)

Sonja Klara Stojanovic. Fellow, Nanovic Institute for European Studies; Concurrent, Gender Studies; Assistant Professor, Romance Languages and Literatures. Bachelor of Science, Andrews University, 2006; Master Degree - Unspecified, Univ of IL Urbana-Champaign, 2007; Bachelor Degree - Unspecified, Andrews University, 2007; Master of Arts, University of Notre Dame, 2010; Master of Arts, Brown University, 2013; Philosophiae Doctor, ibid., 2017 (2017)

Stephan Alfred Stolz. The Rev. John A. Zahm, C.S.C., Professor of Mathematics; Professor, Mathematics. Bachelor of Science, University of Bielefeld, 1975; Master of Science, Rhenish Friedrich Wilhelm U Bo, 1979; Philosophiae Doctor, Johannes Gutenberg Univ of Mai, 1984 (1986)

Daniel Charles Stowe. Associate Teaching Professor, Music; Director, Glee Club. Bachelor of Arts (Latin), Univ California Davis, 1984; Master of Music, Univ of Southern California, 1986; Master of Arts, Cornell University, 1989 (1993)


Duncan G. Stroik. Professor, School of Architecture; Fellow, Nanovic Institute for European Studies; Fellow, Institute for Real Estate. Bachelor of Architecture, University of Virginia, 1984; Master of Architecture, Yale University, 1987 (1990)

James Xavier Sullivan. Gilbert F. Schaefer College Professor of Economics; Director, Lab for Economic Opportunities; Fellow, Institute for Real Estate; Professor, Department of Economics. Bachelor of Arts, University of Notre Dame, 1993; Master of Arts, Northwestern University, 1997; Philosophiae Doctor, ibid., 2002 (2002)


Meghan Elizabeth Sullivan. Professor, Philosophy; Director, ND Institute for Advanced Study. Bachelor of Arts, University of Virginia, 2005; Bachelor of Philosophy, Philosophy of Science, Oxford, 2007; Philosophiae Doctor, Rutgers State University of NJ, 2011 (2011)


Daewon Sun. Professor, IT, Analytics and Operations. Bachelor of Business Admin., Korea University, 1994; Master of Business Admin, Bowling Green State University, 1999; Philosophiae Doctor, Pennsylvania St University, 2004 (2004)

Rebecca Surman. Professor, Physics. Bachelor of Arts, SUNY College at Geneseo, 1993; Master of Science, Michigan State University, 1995; Philosophiae Doctor, UNC at Chapel Hill, 1998 (2014)
Mary-Geraldine Navoa Svarovsky. Associate Professor of the Practice, Institute for Educational Initiatives. Bachelor of Science, University of Notre Dame, 1999; Master of Education, ibid., 2001; Master of Science, Univ of Wisconsin-Madison, 2003; Philosophiae Doctor, ibid., 2009 (2014)

Kasey Ann Swanke. Associate Advising Professor, Center for University Advising. Bachelor of Science, University Wisconsin Eau Clair, 2004; Master of Arts, University of Iowa, 2005 (2014)

Christopher Richard Sweet. Assistant Research Professor, Computer Science and Engineering, B.S. Mathematics, University of Leicester, 2001; Doctorate Degree, ibid., 2004 (2005)

Rachel Sarah Sweet. Assistant Professor, Keough School of Global Affairs; Concurrent Assistant Professor, Political Science. Bachelor of Arts, Wheaton College, 2008; Master of Arts, Northwestern University, 2012; Philosophiae Doctor, ibid., 2017 (2019)

Gabor Szekelyhidi. Professor, Mathematics; Notre Dame Professorship. Bachelor of Sciences, Trinity College Cambridge, 2002; Philosophiae Doctor, Imperial Coll of Science & Tec, 2006 (2011)

Sonja Maps Anne Szekelyhidi. Associate Professor of the Practice, Mathematics. B.S. Mathematics, University of Notre Dame, 2002; M.S. Mathematics, Columbia University, 2004; Master of Philosophy, ibid., 2006; Philosophiae Doctor, ibid., 2009 (2012)

Alexandros A. Taflanidis. Concurrent, Aerospace and Mechanical Engineering; Fellow, Kellogg Institute for International Studies; Fellow, Institute for Real Estate; Professor, Civil & Envir Engr & Earth Sciences. Bachelor of Arts, Aristotle University of Thessa, 2002; Master of Science, ibid., 2003; Philosophiae Doctor, California Institute of Techno, 2007 (2008)

Aldo Carlo Fernando Tagliabue. Assistant Professor, Classics. Bachelor of Arts, Universita Degli Studi, 2004; Master of Arts, ibid., 2006; Philosophiae Doctor, ibid., 2011 (2017)

Wanpeng Tan. Associate Research Professor, Physics. B.S. Physics, Beijing University, 1994; Master of Science, Chinese Academy of Sciences, 1997; Philosophiae Doctor, Michigan State University, 2002 (2002)

Jennifer Leah Tank. The Ludmilla E. Stephen J., and Robert T. Galla Professor of Biological Sciences; Professor, Biological Sciences. Bachelor of Science, Michigan State University, 1988; Master of Science, Virginia Polytechnic Institute, 1992; Philosophiae Doctor, ibid., 1996 (2000)

Melvin Raymond Tardy. Associate Teaching Professor, Center for University Advising. Bachelor of Arts, University of Notre Dame, 1986; Master of Business Admin, ibid., 1990 (1990)

Todd Robert Taylor. Assistant Teaching Professor, College of Engineering; Director, College of Engineering; Director, Associate Director of Integrated Engineering Business Practices and Curriculum. Bach of Sci in Aerospace Engr, University of Notre Dame, 1987; Master of Engineering, City University of Seattle, 1989 (2019)


Nicholas Y. Teh. Associate Professor, Philosophy. Bachelor of Arts, Princeton University, 2005; Master of Arts, University of Pittsburgh, 2008; Philosophiae Doctor, University of Cambridge, 2012 (2015)


Ann Elizabeth Tenbrunsel. David E. Gallo Professor of Business Ethics; Professor, Management & Organization; Co-Director, College of Business Ethics. Bachelor of Science, University of Michigan, 1986; Master of Arts, Northwestern University, 1990; Philosophiae Doctor, ibid., 1995 (1995)

Douglas L. Thain. Professor, Computer Science and Engineering; Associate Chair, Computer Science and Engineering. Bachelor of Science, Univ of Minnesota of Minneapolis, 1997; Master of Science, Univ of Wisconsin-Madison, 1999; Philosophiae Doctor, ibid., 2004 (2004)

David Wayne Thomas. Associate Professor, English; Fellow, Nanovic Institute for European Studies. Bachelor of Philosophy, University of North Dakota May, 1988; Master of Arts, Univ California Davis, 1991; Philosophiae Doctor, ibid., 1996 (2005)

Julia A. Thomas. Associate Professor, History. Bachelor of Arts (Latin), Princeton University, 1981; Master of Arts, University of Chicago, 1984; Philosophiae Doctor, ibid., 1993 (2001)


Flint Owen Thomas. Professor, Aerospace and Mechanical Engineering. B.S. Physics, Indiana State University Main, 1977; M.S. Mechanical Engr, Purdue University, 1980; Philosophiae Doctor, ibid., 1983 (1988)


Jason David Thompson, III. Associate Professor, Naval Science. Bachelor of Science, US Merchant Marine Academy, 2000; Master of Science, Embry-Riddle Aeronautical Univ, 2014 (2019)

Ashley Parkinson Thrall. Myron and Rosemary Noble Collegiate Professor of Structural Engineering; Associate Professor, Civil & Environmental Engineering & Earth Sciences; Fellow, Institute for Real Estate. Bachelor of Physics, Vassar College, 2004; M.S. Civil Engr, Princeton University, 2008; Master of Science, ibid., 2009; Philosophiae Doctor, ibid., 2011 (2011)

Tang Tian. Assistant Librarian, Library Law. Bachelor of Arts, Peking Normal University, 2016; Master of Arts, University of Chicago, 2018; Master of Library & Info Sci, Univ of IL Urbana-Champaign, 2019 (2020)


Gregory L. Timp. Keough-Hesburgh Professor of Electrical Engineering and Biological Sciences; Professor, Electrical Engineering; Professor, Biological Sciences; Fellow, Nanovic Institute for European Studies. Bach of Sci in Electrical Engr, Univ of IL Urbana-Champaign, 1978; M.S. Electrical Engr, Massachusetts Institute of Tec, 1980; Philosophiae Doctor, ibid., 1984 (2010)

Rachel Tomas Morgan. Assistant Teaching Professor, Center for Social Concerns; Concurrent Assistant Teaching Professor, Theology. Bachelor of Arts, Saint Mary's College, 1991; Master of Arts, University of Notre Dame, 1998 (1998)
Maria Carolina Tomasula. Michael P. Grace Professor of Arts; Professor, Art, Art History, and Design. Bachelor of Fine Arts, Univ of Illinois-Chicago, 1987; Master of Fine Arts, Northwestern University, 1989 (1994)

Steve A. Tomasula. Professor, English. Bachelor of Science, Purdue University, 1976; Master of Arts, Univ of Illinois-Chicago, 1982; Philosophiae Doctor, ibid., 1995 (1996)

Andrea Lee Topash-Rios. Associate Teaching Professor, Romance Languages and Literatures. Bachelor of Arts, University of Notre Dame, 1995; Master of Arts, ibid., 1996 (2000)

Deborah Gerber Tor. Associate Professor; History. Bachelor of Arts, Hebrew University of Jerusalem, 1992; Master of Arts, ibid., 1996; Philosophiae Doctor, Harvard University, 2002 (2010)

Avishalom Tor. Professor, Law School; Bachelor of Arts, Hebrew University of Jerusalem, 1996; Legum Magister, Harvard University, 1998; Juridicae Scientiae Doctor, ibid., 2003 (2011)

Zoltan Toroczkai. Professor, Physics; Concurrent Professor, Computer Science and Engineering. Bachelor of Science, Babes Bolyai University, 1990; Master of Science, ibid., 1992; Philosophiae Doctor, Virginia Polytechnic Institute, 1997 (2006)

Alexis Charles Torrance. Associate Professor; Theology; Archbishop Demetrius Assistant Professor of Byzantine Theology; Fellow, Medieval Institute. Bachelor of Arts, Greyfriars Oxford, 2006; Master of Science, Christ Church Oxford, 2007; Philosophiae Doctor, ibid., 2010 (2012)

Marta Toth. Assistant Research Professor, Chemistry and Biochemistry; Assistant Professor of the Practice. Bachelor Degree - Unspecified, Jozsef Attila University, 1979; M.S. Biology, ibid., 1980; Master of Science, ibid., 1986; Doctorate Degree, ibid., 1986 (2003)

Alain Paul Toumayan. Professor, Romance Languages and Literatures. Bachelor of Arts, Univ of Pennsylvania, 1976; Master of Arts, Yale University, 1978; Master of Philosophy, ibid., 1980; Philosophiae Doctor, ibid., 1982 (1989)

Thien-Toan Huu Tran. Associate Research Professor, Chemical and Biomolecular Eng. Bachelor of Science, Univ California Irvine, 2009; Philosophiae Doctor, Univ of California Riverside, 2018 (2020)

Guillermo Trejo. Associate Professor, Political Science; Fellow, Kellogg Institute for International Studies. Master of Arts, Columbia University, 1994; Philosophiae Doctor, University of Chicago, 2004; Philosophiae Doctor, Instituto Tecnologico Autonomo, ; Bachelor of Arts, National University of Mexico, (2012)

Christine Patricia Trinter. Associate Professor of the Practice, Inst for Educational Initiatives. Bachelor of Arts, Fordham University College of, 1996; Master of Arts Education, Columbia University Teachers C, 2001; Philosophiae Doctor, University of Virginia, 2011 (2017)


Yuhsin Tsai. Assistant Professor, Physics. B.S. Physics, National Tsing Hua University, 2004; Philosophiae Doctor, Cornell University, 2012 (2020)

Emily Yuan Tsui. Assistant Professor, Chemistry and Biochemistry. Bachelor of Science, Massachusetts Institute of Tec, 2008; Philosophiae Doctor, California Institute of Techno, 2014 (2017)

Patrick Turner. Research Assistant Professor, Department of Economics. Bachelor of Science, Saint Louis University, 2009; Master of Arts, Univ of Colorado-Boulder, 2014; Philosophiae Doctor, ibid., 2018 (2018)

Danielle Tussing. Assistant Professor, Management & Organization. Bachelor of Science, Davidson College, 2009; Philosophiae Doctor, Univ of Pennsylvania, 2018 (2018)

Thomas Tweed. W. Harold and Martha Welch Endowed Chair in American Studies; Professor, American Studies; Professor, History; Fellow, Juan B. Kroc Institute for International Peace; Fellow, Kellogg Institute for International Studies. Bachelor of Science, Pennsylvania State University, 1977; Master of Theological Studies, Harvard University, 1979; Master of Arts, Stanford University, 1983; Philosophiae Doctor, ibid., 1989 (2013)

Sayako Uehara. Assistant Teaching Professor, East Asian Languages and Cultures. Bachelor of Arts, Pacific Union College, 2007; Master of Arts, San Francisco State University, 2010; Master of Arts, New York University, 2012; Philosophiae Doctor, Michigan State University, 2019 (2018)

Joel Edwin Urbanby. Professor, Marketing. Bachelor of Science, Ohio State University, 1980; Master of Science, ibid., 1983; Philosophiae Doctor, ibid., 1984 (1994)


Dominic Ovide Vachon. Ruth M. Hillebrand Director of the Center for Compassionate Care in Medicine; ; Professor of the Practice, Preprofessional Studies. Bachelor of Arts, University of Notre Dame, 1980; Master of Divinity, ibid., 1985; Philosophiae Doctor, Loyola University Chicago, 1993 (2009)


Kristin Valentino. William J. Shaw Center for Children and Families Associate Professor of Psychology; Professor, Psychology; Director of the William J. Shaw Center for Children and Families. Bachelor of Arts, Georgetown College, 2002; Master of Arts, University of Rochester, 2005; Philosophiae Doctor, ibid., 2007 (2009)

J. Samuel Valenzuela. Professor, Sociology; Concurrent Professor, Political Science; Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies. Philosophiae Doctor, Columbia University, 1979 (1986)

Azareen Van Der Vliet Oloomi. Associate Professor, English; Concurrent Associate Professor, Romance Languages and Literatures. Bachelor of Arts, Univ of California-San Diego, 2005; Master of Fine Arts, Brown University, 2009 (2012)


Charles Francis Vardeman, II. Assistant Research Professor, Computer Science and Engineering. Bachelor of Science, University of Notre Dame, 2000; Philosophiae Doctor, ibid., 2009 (2009)

Kevin T. Vaughan. Associate Professor, Biological Sciences. Bachelor of Arts, Hamilton College, 1984; Master of Science, State Univ of NY-Buffalo, 1986; Philosophiae Doctor, Cornell University Medical Cen, 1992 (1998)


Julian Velasco. Associate Professor, Law School. B.S. Business Administration, Georgetown University, 1991; Juris Doctor, Columbia University, 1994 (2001)
<table>
<thead>
<tr>
<th>Name</th>
<th>Title and Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anre Venter</td>
<td>Teaching Professor, Psychology; Director of Undergraduate Studies, Psychology, Bachelor of Arts, University of Cape Town, 1980; Master of Arts, Pepperdine University, 1990; Master of Arts, University of Notre Dame, 1994; Juris Doctor, ibid., 1995</td>
</tr>
<tr>
<td>Elliott Thomas Visconsí</td>
<td>Associate Provost and Chief Academic Digital Officer; Associate Professor, English, Bachelor of Arts (Latin), College of the Holy Cross, 1995; Philosophiae Doctor, Univ. of California-Los Angeles, 2001; Master of Law, Yale Law School, 2010</td>
</tr>
<tr>
<td>Juan Marcelo Vitulli</td>
<td>Associate Professor, Romance Languages and Literatures; Fellow, Kellogg Institute for International Studies, Bachelor of Arts, National University of Rosario, 2000; Master of Arts, Vanderbilt University, 2005; Philosophiae Doctor, ibid., 2007</td>
</tr>
<tr>
<td>Patrick Leonard Vivirito</td>
<td>Associate Teaching Professor, Romance Languages and Literatures, B.S. Criminal Justice, ibid., 1997; Bachelor of Arts, Loyola University Chicago, 1997; Master of Arts, University of Notre Dame, 2002</td>
</tr>
<tr>
<td>Troy Joseph Vogel</td>
<td>Associate Teaching Professor, Chemical and Biomolecular Engr, Bach of Sci in Chemical Engr, Ohio State University, 2006; Philosophiae Doctor, ibid., 2011</td>
</tr>
<tr>
<td>Warren J. von Eschenbach</td>
<td>Associate Teaching Professor, VP-Asoc Prov for Internationaliztn; Concurrent Associate Professor, American Studies, First Year of Studies; Fellow, Nanovic Institute for European Studies, Bachelor of Arts, Trinity University, 1994; Master of Arts, Marquette University, 1996; Philosophiae Doctor, Univ of Texas-Austin, 2006</td>
</tr>
<tr>
<td>Dervis Can Vural</td>
<td>Associate Professor, Physics, Master of Science, Univ of IL Urbana-Champaign, 2004; Philosophiae Doctor, ibid., 2011</td>
</tr>
<tr>
<td>Jennifer Rotondo Waddell</td>
<td>Associate Teaching Professor, IT, Analytics and Operations; Assistant Chair, Mendoza College of Business; Director of Undergraduate Studies in the IT, Analytics and Operations Department, Bachelor of Arts, Muhlenberg College, 1995; Master of Arts, University of Notre Dame, 1998; Philosophiae Doctor, ibid., 2000</td>
</tr>
<tr>
<td>David Paul Waddilove</td>
<td>Associate Professor, Law School, Master of Arts in Religion, Yale University-Div School, 2004; Juris Doctor, University of Michigan, 2007; Doctor of Philosophy, University of Cambridge, 2015</td>
</tr>
<tr>
<td>Todd Wałata</td>
<td>Associate Teaching Professor, Theology; Assistant Chair for Graduate Studies, Bachelor of Arts, University of Dayton, 2004; Master of Theological Studies, University of Notre Dame, 2006; Philosophiae Doctor, ibid., 2011</td>
</tr>
<tr>
<td>Katherine Elizabeth Walden</td>
<td>Assistant Teaching Professor, American Studies, Bachelor of Music, Vanderbilt University, 2014; Master of Arts, University of Iowa, 2016; Master of Arts, ibid., 2016; Master of Arts, ibid., 2018; Master of Arts, ibid., 2018; Philosophiae Doctor, ibid., 2019</td>
</tr>
<tr>
<td>Diane Parr Walker</td>
<td>Edward H. Arnold University Librarian; Librarian, Hesburgh Libraries, Master of Science, Macmurray College, 1975; Master of Music, University of Iowa, 1977; M.S. Library Science, Univ of IL Urbana-Champaign, 1978</td>
</tr>
<tr>
<td>Robert E. Walls</td>
<td>Assistant Teaching Professor, American Studies, Bachelor of Arts, Univ of Washington, 1980; Master of Arts, Indiana Univ-Bloomington, 1987; Philosophiae Doctor, ibid., 1997</td>
</tr>
<tr>
<td>Laura Dassow Walls</td>
<td>William P. and Hazel B. White Professor of English; Professor, English; Concurrent Professor, American Studies, Bachelor of Arts, Univ of Washington, 1976; Master of Arts, ibid., 1978; Philosophiae Doctor, Indiana Univ-Bloomington, 1992</td>
</tr>
<tr>
<td>Kevin Quinn Walsh</td>
<td>Assistant Teaching Professor, Civil &amp; Envr Engr &amp; Earth Sciences, Bach of Sci in Civil Engr, University of Dayton, 2007; Undeclared, Sinclair Community College, 2017</td>
</tr>
<tr>
<td>Molly Kay Walsh</td>
<td>Associate Teaching Professor, Applied Computational Math &amp; Stats, Bachelor of Science, University of Notre Dame, 1985; Master of Science, Northern Illinois Univ, 1987; Philosophiae Doctor, Northwestern University, 1991</td>
</tr>
<tr>
<td>Zheng Wang</td>
<td>Librarian, Hesburgh Libraries, Bachelor of Arts, Beijing Union University, 1998; Master of Library &amp; Info Sci, Queens College, 2001; Master of Science, Pace University New York Campus, 2006</td>
</tr>
<tr>
<td>Xian Wang</td>
<td>Assistant Professor, East Asian Languages and Cultures, Bachelor of Arts, Jianghan University, 2004; Master of Arts, Nanjing University, 2008; Master of Arts, Duke University, 2010; Philosophiae Doctor, Univ of Oregon, 2018</td>
</tr>
<tr>
<td>Emily Ambrose Wang</td>
<td>Assistant Professor, German and Russian Languages and Literature; Fellow, Nanovic Institute for European Studies, Bachelor of Arts, Wesleyan University, 2008; Philosophiae Doctor, Princeton University, 2016</td>
</tr>
</tbody>
</table>

To Table of Contents
Lijuan Wang. Professor, Psychology. Bachelor of Science, Renmin University Beijing, 2000; Master of Science, ibid., 2003; Master of Arts, University of Virginia, 2006; Philosophiae Doctor, ibid., 2008 (2008)


Jian-Xun Wang. Assistant Professor, Aerospace and Mechanical Engineering, Bach of Sci in Envmntal Engr, Harbin Institute of Technology, 2011; Master in Mechanical Engr, ibid., 2013; Master in Mechanical Engr, Virginia Polytechnic Institute, 2016; Philosophiae Doctor, ibid., 2017 (2018)

Jing Wang. Assistant Teaching Professor, Aerospace and Mechanical Engr. Bachelor of Physics, Nanjing Normal University, 2005; Master in Mechanical Engr, ibid., 2008; Master in Mechanical Engr, Rensselaer Polytechnic Institu, 2011 (2017)

Yichun Wang. Assistant Professor, Chemical and Biomolecular Engr. Bachelor of Science, Southeast University, 2006; Master of Science, University of Michigan, 2013; Philosophiae Doctor, ibid., 2016 (2020)

Chao Li Wang. Associate Professor, Computer Science and Engineering, Bachelor of Engineering, Fuzhou University, 1998; Master of Engineering, ibid., 2001; Philosophiae Doctor, Ohio State University, 2006 (2014)


Chen Wang. Instructor, Finance. Bachelor of Arts, Peking University, 2012; Bachelor of Arts, ibid., 2012; Bachelor of Arts, ibid., 2012; Bachelor of Arts, ibid., 2012; Bachelor of Arts, ibid., 2012; Bachelor of Arts, ibid., 2012; Bachelor of Arts, ibid., 2012; Bachelor of Science, Columbia Univ - Main Division, 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014; Master of Science, ibid., 2014 (2017)

Joseph Peter Wawrykow. Professor, Theology. Bachelor of Arts, University of Manitoba, 1978; Master of Arts, ibid., 1980; Master of Arts, Yale University, 1981; Master of Philosophy, ibid., 1985; Philosophiae Doctor, ibid., 1986 (1986)


Matthew Jerry Webber. Assistant Professor, Chemical and Biomolecular Engineering; Concurrent Assistant Professor, Chemistry and Biochemistry. Bach of Sci in Chemical Engr, University of Notre Dame, 2006; Master of Engineering, Northwestern University, 2009; Philosophiae Doctor, ibid., 2011 (2016)

Na Wei. Associate Professor, Civil & Envr Engr & Earth Sciences. B.S. Engineering & Environ Sci, Sichuan University, 2006; Master of Engineering, Univ of IL Urbana-Champaign, 2008; Philosophiae Doctor, ibid., 2011 (2015)

Jerry C. Wei. Associate Professor, IT, Analytics and Operations. Bachelor of Science, National Tsing Hua University, 1979; Master of Engineering, Rochester Inst of Technology, 1983; Philosophiae Doctor, Texas A&M University, 1987 (1987)

Paul Jude Weithman. Glynn Family Honors Professor of Philosophy; Director, Honors Program in Arts and Sciences; Professor, Philosophy. Bachelor of Arts, University of Notre Dame, 1981; Master of Arts, Harvard University, 1986; Philosophiae Doctor, ibid., 1988 (1990)

Brad Douglas Weldon. Teaching Professor, Civil & Envr Engr & Earth Sciences. Bachelor of Science, New Mexico State Univ. Park, 2001; Master of Science, University of Notre Dame, 2006; Philosophiae Doctor, ibid., 2010 (2020)

Susanne Wengle. Fellow, Kellogg Institute for International Studies; Fellow, Nanovic Institute for European Studies; Concurrent, Keough School of Global Affairs; Associate Professor, Political Science. Bachelor of Science, London School of Economics, 2000; Master of Arts, Univ of California Berkeley, 2004; Philosophiae Doctor, ibid., 2010 (2015)
Timothy Weninger. Associate Professor, Computer Science and Engineering; Frank M. Freimann Associate Professor of Engineering. Bachelor of Science, Kansas State University, 2007; Master of Science, ibid., 2008; Philosophiae Doctor, Univ of II. Urbana-Champaign, 2013 (2013)


Sarah E. West. Associate Teaching Professor, Chemistry and Biochemistry. Bachelor of Arts, Augustana College, 1996 (1998)

Joannes J. Westerink. Joseph and Nona Ahearn Professor of Computational Engineering and Science; Professor, Civil & Environmental Engineering & Earth Sciences; Department Chair, Civil & Environmental Engineering & Earth Sciences; Concurrent Professor, Applied Computational Mathematics & Statistics; Concurrent Professor, Aerospace and Mechanical Engineering; Concurrent Professor, Computer Science and Engineering; Fellow, Institute for Real Estate. Bachelor of Science, State Univ of NY-Buffalo, 1979; Master of Science, ibid., 1981; Philosophiae Doctor, Massachusetts Institute of Tec, 1984 (1990)

Michelle A. Whaley. Teaching Professor, Biological Sciences. Bachelor of Arts, Scripps College, 1987; Philosophiae Doctor, University of Notre Dame, 1993 (1993)

Rebecca Jean Whelan. Associate Professor, Chemistry and Biochemistry. Bachelor of Arts, Lawrence University, 1996; Bachelor of Arts, ibid., 1996; Bachelor of Arts, ibid., 1996; Bachelor of Arts, ibid., 1996; Philosophiae Doctor, Stanford University, 2003 (2018)

Kevin Whelan. Teaching Professor, Dublin; Michael J. Smurfit Director, Notre Dame Dublin Global Gateway. Bachelor of Arts, University College Dublin, 1978; Philosophiae Doctor, National Univ of Ireland Dublin, 1981 (1998)

Sophie K. White. Concurrent, African and African American Studies; Concurrent, Gender Studies; Professor, American Studies; Fellow, Nanovic Institute for European Studies; Concurrent, History. Master of Arts, University of Edinburgh, 1990; Master of Arts, Courtauld Institute of Art, 1993; Philosophiae Doctor, ibid., 2000 (2001)

Hal Derrick White. Vincent and Rose Lizzadro Professor of Accountancy; Professor, Accountancy. Bachelor of Science, University of Alabama, 1998; Master of Business Admin, ibid., 2002; Philosophiae Doctor, Pennsylvania St University, 2007 (2019)

Katharine A. White. Assistant Professor, Chemistry and Biochemistry. Bachelor of Science, Saint Mary's College, 2007; Philosophiae Doctor, Massachusetts Institute of Tec, 2012 (2019)

Jonathan Whitmer. Associate Professor, Chemical and Biomolecular Engr. Bachelor of Science, Kansas State University, 2005; Master of Science, Univ of Illinois-Chicago, 2009; Philosophiae Doctor, ibid., 2011 (2014)

Todd David Whimtore. Associate Professor, Theology; Concurrent Associate Professor, Anthropology; Director of the Interdisciplinary Minor, Catholic Social Tradition. . Bachelor of Arts, Wabash College, 1979; Master of Divinity, Harvard Divinity School, 1985; Philosophiae Doctor, University of Chicago, 1990 (1990)

Elin Nicole Wibbens. Associate Professor of the Practice, Inst for Educational Initiatives. Bachelor of Arts, University of Notre Dame, 2002; Masters in Education, Loyola University Chicago, 2006; Philosophiae Doctor, Michigan State University, 2013 (2013)

Michael Caspar Wiescher. The Frank M. Freimann Professor of Physics; Professor, Physics; Director, Joint Institute for Nuclear Astrophysics. Bachelor of Arts, University of Munster, 1972; Master of Arts, ibid., 1975; Philosophiae Doctor, ibid., 1980 (1986)


Steven Milo Wietstock. Teaching Professor, Chemistry and Biochemistry; Associate Teaching Professor. B.S. Chemistry, Alma College, 1982; Philosophiae Doctor, Uniformed Services Health Sci., 1988 (2005)

William L. Wilkie. The Alcyonius and Eleanor Professor of Marketing; Professor, Marketing. Bachelor of Business Admin., University of Notre Dame, 1966; Master of Business Admin, Stanford University, 1969; Philosophiae Doctor, ibid., 1971 (1987)

Shauna Loree Williams. Teaching Professor, Romance Languages and Literatures; Fellow, Nanovic Institute for European Studies; Director of Undergraduate Studies, Romance Languages and Literature. Bachelor of Arts, Evangel College, 1989; Master of Arts Education, Indiana Univ South Bend, 2002 (2004)


Oliver F. Williams, CSC. Associate Professor, Management & Organization. Bachelor of Science, University of Notre Dame, 1961; Master of Arts, ibid., 1969; Philosophiae Doctor, Vanderbilt University, 1974 (1973)

Nathan Daniel Wills, CSC. Assistant Teaching Professor, Inst for Educational Initiatives. Bachelor of Arts, University of Notre Dame, 1999 (2015)

Rebecca Ann Wingert. Elizabeth and Michael Gallagher Family Professorship in Adult Stem Cell Research; Associate Professor, Biological Sciences. Bachelor of Arts, Muhlenberg College, 1999; Philosophiae Doctor, Harvard University, 2005 (2010)

Abraham Winitzer. Associate Professor, Theology. Bachelor of Arts, Brandeis University, 1992; Master of Arts, ibid., 1995; Philosophiae Doctor, Harvard University, 2006 (2008)

Damrongk Sirasat. Research Assistant Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor of Engineering, King Mongkut’s Inst of Tech-Th, 1997; Master of Engineering, ibid., 1999; M.S. Mechanical Engr, University of Notre Dame, 2005; Philosophiae Doctor, ibid., 2007 (2008)


Pamela Wojcik. Professor, Film, Television, and Theatre; Concurrent Professor, American Studies; Concurrent Professor, Gender Studies; Department Chair, Film, Television, and Theatre. Bachelor of Arts, Wellesley College, 1986; Master of Arts, University of Chicago, 1988; Philosophiae Doctor, ibid., 1993 (1998)

Christina Katherine Wolbrecht. Professor of Political Science and the Francis and Kathleen Rooney Center for the Study of American Democracy; Professor, Political Science; Director, Rooney Ctr for American Democracy; Academic Director, Washington Programs. Bachelor of Arts, Pacific Lutheran University, 1992; Master of Arts, Washington University, 1994; Philosophiae Doctor, ibid., 1997 (1997)
Danielle M. Wood. Associate Professor of the Practice, Dean's Office-Call of Engineering; Fellow, Center for Social Concerns; Associate Director, Research in Center for Civic Innovation; Fellow, Center for Social Concerns. Bachelor of Science, Purdue University, 1992; Master of Science, University of Wisconsin Center, 1996; Philosophiae Doctor, ibid., 2012 (2013) 


Nicole Lynn Woods. Assistant Professor, Art, Art History, and Design; Concurrent Assistant Professor, Gender Studies; Concurrent Assistant Professor, Film, Television, and Theatre. Bachelor of Arts, Univ.of California-Los Angeles, 1999; Master of Arts, ibid., 2005; Philosophiae Doctor, Univ California Irvine, 2010 (2013) 

Kaitlin Dunn Wowak. Assistant Professor, IT, Analytics, and Operations. Associate in Arts, Tacoma Community College, 2004; Bachelor of Science, University of Florida, 2006; Master of Science, Johns Hopkins University, 2008; Philosophiae Doctor, Pennsylvania State University, 2012 (2012) 

Adam J. Wowak. Associate Professor, Management & Organization. Bachelor of Science, Pennsylvania State University, 2000; Philosophiae Doctor, ibid., 2011 (2010) 

Timothy Everett Wright. Assistant Research Professor, Computer Science and Engineering; Assistant Director, Information Systems Security and Compliance, Center for Research Computing. Bachelor of Arts, Indiana Univ South Bend, 1991; Bachelor of Science, ibid., 1994; M.S. Computer Sci and Engr, Univ of NC-Charlotte, 2000; Philosophiae Doctor, University of Notre Dame, 2009 (2002) 

Jing Cynthia Wu. Dillon Hall Associate Professor of Economics; Associate Professor, Department of Economics. Bachelor of Arts, Renmin University of China, 2005; Philosophiae Doctor, Univ. of California-San-Diego, 2011 (2018) 

Yu Xiao. Assistant Professor, Department of Economics. Master of Arts (Latin), University of Cambridge, 2011; Master of Philosophy, ibid., 2012; Philosophiae Doctor, ibid., 2017 (2017) 


Xiaoshan Yang. Associate Professor, East Asian Languages and Culture. Bachelor of Arts, Anhui Normal University, 1982; Master of Arts, Peking University, 1985; Philosophiae Doctor, Harvard University, 1994 (1997) 

Jun Yang. Assistant Professor, Bachelor of Arts, Beijing Foreign Studies Univ, 2009; Master of Science, Washington University, 2011; Philosophiae Doctor, Boston College, 2018 (2018) 

Weibing Ye. Assistant Teaching Professor, East Asian Languages and Culture; Coordinator, Chinese Programs. Bachelor of Science, China Agriculture Univ., 2004; Master of Arts, Beijing Language & Culture Uni, 2010 (2014) 


Chengsu Yin. Teaching Professor, East Asian Languages and Culture. Bachelor of Arts, Peking University, 1984; Master of Arts, Univ of Massachusetts, 1990 (2000) 

Yeonhee Yoon. Professor of the Practice, East Asian Languages and Culture; Language Coordinator, Korean Program. Bachelor of Science, Ewha Women's University, 1986; Master of Arts, University of Hawaii at Manoa, 2006; Philosophiae Doctor, ibid., 2010 (2013) 

Kathleen Lira Yoon. Associate Professor, Psychology. Bachelor of Arts, Yonsei University, 1997; Master of Arts, ibid., 1999; Master of Science, Northwestern University, 2002; Philosophiae Doctor, ibid., 2006 (2014) 

Sangpil Yoon. Assistant Professor, Aerospace and Mechanical Engineering. Bach of Sci in Mech Engr, Yonsei University, 2002; M.S. Aerospace Engr, Georgia Institute of Technolog, 2004; Philosophiae Doctor, Univ of Texas-Austin, 2013 (2018) 

Sharon Jihyun Yoon. Assistant Professor, Keough School of Global Affairs. Bachelor of Arts, Dartmouth College, 2004; Philosophiae Doctor, Princeton University, 2013 (2020) 

Samir Younes. Professor, School of Architecture. Bachelor of Science, University of Texas at Dallas, 1981; Master of Architecture, ibid., 1984 (1991) 

Kelley Young. Assistant Teaching Professor, Chemistry and Biochemistry. Bachelor of Science, Adrian College, 2009; Philosophiae Doctor, Michigan State University, 2015 (2016) 

Qiang Yu. Research Assistant Professor, Civil & Environmental Engineering & Earth Sciences. Bachelor Degree - Unspecified, Beijing Univ. of Chem. Tech., 2003; Master Degree - Unspecified, Tsinghua University, 2009; Philosophiae Doctor, University of Notre Dame, 2015 (2015) 

Ke-Hai Yuan. Professor, Psychology. Bachelor of Science, Beijing Institute of Technolog, 1985; Master of Arts, ibid., 1988; Philosophiae Doctor, Univ.of California-Los Angeles, 1995 (2001) 

Nicholas Zabarasz. Viola D. Hank Professor of Aerospace and Mechanical Engineering; Professor; Concurrent Professor, Applied and Computational Mathematics and Statistics; Concurrent Professor, Civil & Environmental Engineering & Earth Sciences; Concurrent Professor, Electrical Engineering; Director, Center for Informatics and Computational Science. Master in Mechanical Engr, University of Rochester, 1983; Philosophiae Doctor, Cornell University, 1987 (2016) 

Matthew Joseph Zahr. Assistant Professor, Aerospace and Mechanical Engineering. Bachelor of Science, University of California, San Diego, 2011; Philosophiae Doctor, ibid., 2016 (2019) 

Rafael Zambrana. Assistant Professor, Finance. Master of Science, Universidad Carlos III, 2011; Philosophiae Doctor, ibid., 2015 (2019) 

Jeremiah Zartman. Associate Professor, Chemical and Biomolecular Engineering. Bachelor of Science, University of Colorado, 2004; Master of Arts, Princeton University, 2006; Philosophiae Doctor, ibid., 2009 (2012) 

William F. Zech. Assistant Teaching Professor, Physics. Associate in Science, Lake Michigan College, 1999; Bachelor of Science, Indiana Univ South Bend, 2002; Master of Science, University of Notre Dame, 2005; Philosophiae Doctor, ibid., 2009 (2009) 


Guangjian Zhang. Associate Professor, Psychology. Bachelor of Medicine, Tianjin Medical College, 1994; Masters in Education, Beijing University, 1999; Master of Science, Ohio State University, 2004; Philosophiae Doctor, ibid., 2006 (2006)
Zhiyong Zhang. Professor, Psychology. Bachelor of Arts, Renmin University Beijing, 2000; Master of Arts, ibid., 2003; Master of Arts, University of Virginia, 2005; Philosophiae Doctor, ibid., 2008 (2008)


Siyuan Zhang. Nancy Dee Assistant Professor of Cancer Research; Associate Professor, Biological Sciences. Doctorate of Medicine, Peking University, 1998; Philosophiae Doctor, National University of Singapo, 2005 (2012)

Zhenbin Zhang. Assistant Research Professor, Chemistry and Biochemistry. Bachelor of Science, Central-South University of T e, 206; Master of Science, South China Normal University, 2009; Philosophiae Doctor, Dalian Institute of Chemical P, 2013 (2013)

Michael Nan Zhao. Assistant Professor, Philosophy. Bachelor of Arts, Princeton University, 2010; Philosophiae Doctor, New York University, 2018 (2020)

Zifeng Zhao. Instructor, IT, Analytics and Operations; Concurrent Assistant Professor, Applied Computational Mathematics & Statistics. Master of Science, University of Wisconsin Center, 2016; Philosophiae Doctor, ibid., 2018; Undeclared, The Chinese Univ. of Hong Kong, (2018)

Xuying Zhao. Associate Professor, IT, Analytics and Operations. Bachelor of Science, Zhejiang University, 2000; Master of Science, University of Texas at Dallas, 2005; Philosophiae Doctor, Zhejiang University, 2007 (2007)

Yongping Zhu. Associate Professor, East Asian Languages and Cultures; Department Chair, East Asian Languages and Cultures. Bachelor of Arts, Shaanxi Normal University, 1982; Master of Arts, ibid., 1987; Master of Arts, University of Minnesota, 1994; Philosophiae Doctor, ibid., 2002 (2013)

Calvin R Zimmermann. Assistant Professor, Sociology. Bachelor of Arts, Southern Illinois Univ at Carb, 2013; Master of Arts, Univ of Pennsylvania, 2015; Philosophiae Doctor, ibid., 2018 (2019)

Pinar Zorlutuna. Sheehan Family Professor of Engineering; Associate Professor, Aerospace and Mechanical Engineering. B.S. Biology, University of Ankara, 2002; Master of Science, Middle East Technical Universi, 2005; Philosophiae Doctor, ibid., 2009 (2014)

Damian Francis Zurro. Assistant Teaching Professor, Univ Writing Program. Bachelor of Arts, University of Notre Dame, 2003; Master of Arts, Yale University-Div School, 2006; Philosophiae Doctor, University of Notre Dame, 2015 (2015)
## Index

### A

- Academic Association 17, 113
- Academic Calendar 6
- Academic Code of Honor 18
- Academic Council 15
- Academic Governance 15
- Academic Preparation 20
- Academic Profile 14
- Academic Resources 19
- Accountancy 107
- Accreditation 17, 113
- ACT 21, 22
- Activity and Experiential Learning Courses 45
- Admission 20
- Admissions, Office of
  - Regular Decision 21
  - Restrictive Early Action 21
- Advanced Language and Culture 16
- Advising 15
- Aerospace and Mechanical Engineering 118
- Aerospace Studies (ROTC - Air Force) 29
- Africana Studies 50
- American Advertising Federation Chapter 106
- American Studies 51
- Anthropology 52
- Application Process 21
- Applied and Computational Mathematics and Statistics 136, 140
- Architecture, School of 40
- Art, Art History, and Design 53
- Art History Major 55
- Arts and Letters, College of 44
  - Degree Credit 45
  - Pre-Health Studies 91
  - Programs 49
- Art Studio 53
- Asian Studies
  - Minor 132
  - Supplementary Major and Minor 60
  - Supplementary Major in 132
- Asian Studies, Keough School 132
- Asia Pacific Business Club 106
- Association of Latino Professionals in Finance and Accounting 106
- Athletic Facilities 12
- Australia Study Abroad Program
  - Fremantle 30
  - Perth 30
  - Sydney 30
- Bachelor of Arts in Computer Science 58
- Bachelor of Arts in Psychology 81
- Bachelor of Science with a Major in:
  - Applied and Computational Mathematics and Statistics 141, 143
  - Biochemistry 152
  - Biological Sciences 144
  - Chemistry 151
  - Environmental Sciences 147
  - Mathematics 154
  - Neuroscience and Behavior 157
  - Physics 158
  - Preprofessional Studies 161
  - Science-Business 163
  - Science-Computing 164
  - Science-Education 165
- Biochemistry 152
- Biological Sciences 136, 143
- Board of Trustees 4
- Branch Libraries 18
- Brazil: São Paulo Study Abroad Program 30
- Business Action in Social Entrepreneurship (BaseND) 106
- Business Administration 104
- Calendar, Academic 6
- California Study Abroad
  - Domestic Off-Campus Programs
    - Silicon Valley 35
- Campus Life Council 12
- Campus Map 222–223
- Campus Ministry 11
- Campus Resident Student 22
- Campus Security and Fire Safety 13
- Campus Visit 21
- Career and Professional Development 11
- Catholicism and the Disciplines 16
- Catholic Social Tradition 95
- Center for Career Development 36
- Center for Social Concerns 26
- Ceramics Concentration 54
- Chemical and Biomolecular Engineering 120
- Chemistry and Biochemistry 136, 150
- Chemistry Career Program 151
- Chemistry with Business 151
- Chile: Santiago Study Abroad Program 30
- China Study Abroad Program
  - Beijing 31
  - Hong Kong 31
  - Shanghai 31
- Chinese 59
  - Program in Chinese and Classical Chinese 59
- Civil and Environmental Engineering and Earth Sciences 122
- Classics 56
- Clubs and Organizations 12
- College of Arts and Letters 44
- College of Business Administration 103
- College of Engineering 113
- Combination Five-Year Programs 93, 114, 115, 127, 129, 137
- Dual Degree Program 166
- College of Science 136
- Dual Degree Program 114, 137
- Study Abroad 140
- Collegiate Sequence in International Business 105
- Collegiate Sequence Programs 163
- Computer Engineering Program 125
- Computer Science and Engineering 125
- Bachelor of Arts in 58
- Computing and Digital Technologies 92
- Corporate Finance Club 106
- CPA Certification 108
- CSS Financial Aid PROFILE 24
- Curricula and Degrees 44

### D

- Decision and Notification Plans 21
- Degrees and Academic Programs 14
- Denmark: Copenhagen Study Abroad Program 31
- Design Concentrations 54
- Development Studies, International 133
- Disabilities, Students with 22
- Document Delivery 19
- Double Majors in Science 166
- Dual Degree Program 15, 127, 137
- du Lac, A Guide to Student Life 12
K
Keough-Naughton Institute for Irish Studies 134
Keough School of Global Affairs 132
Korean 60

L
Language Requirement 49, 138
Latin 56
Latino Studies 97
Liberal Studies 80
Library Research Award 19
Linguistics 97
Liturgical Music Ministry 98
Liu Institute for Asia and Asian Studies 132
Loans 25

M
Management and Organization 110
Marine Corps 28
Marketing 110
Marketing Club 107
Mathematics 71, 136, 154
and Business Administration 155
and Computing 155
and Engineering Science 155
and Life Sciences 154
and Social Science 155
as a Second Major 155
Career Program 154
Education Program 155
Honors Program 154
Mathematics Courses for the Other Programs 154
Mechanical Engineering 119
Medieval Studies 73, 98
Mediterranean and Middle East Studies 57
Mendoza College of Business 103
Study Abroad 105
Meruelo Family Center for Career Development 36
Mexico: Puebla Study Abroad Program 33
Military Science and Leadership (Army ROTC) 28
Minor in Classical Studies
Greek and Roman Civilization 57
The Classical Heritage 57
Minor in Constitutional Studies 95
Minor in Philosophy, Science, and Mathematics 79
Mission Statement of the University of Notre Dame 10
MoneyThinkND 107
Moreau First Year Experience 17, 35
Moreau Seminary 36
Morocco: Rabat Study Abroad Program 33
Museum of Art 20
Music 74
Musical Theatre 98

N
Nanovic Institute for European Studies 133
National Association of Black Accountants (NABA) 107
Naval Science (ROTC - Navy) 28
NetID Student Policy 18
Neuroscience and Behavior 75, 156
Nondiscrimination i
Notre Dame Club Scholarships 25
Notre Dame Information Technology Management Club 107
Notre Dame Scholarships 24
Notre Dame Subsidized Loan 25
Nondiscrimination 1
Notre Dame Scholarships 24
Notre Dame Subsidized Loan 25

O
Off-Campus Students 23
Office of First Year Advising and Academic Initiatives 37
Office of Information Technologies 35
Office of Student Financial Services 24
Officers of Administration in the University 3
Old College 36

P
Painting Concentration 54
Part-Time Undergraduate Student 23
Pass-Fail 45
Payment Plan 24, 25
Payment Regulations 23
Peace Studies, Keough School 134
Pell Grant 25
Philosophy 16, 78
Philosophy, Politics, and Economics 98
Philosophy, Religion, And Literature 99
Photography Concentration 54
Physics 136, 158
Advanced 159
Physics-in-Medicine 160
PLUS 25
Political Science 79
Poverty Studies 27
Pre-Health Studies 91
Pre-Law Advising 15
Preprofessional Studies 136, 161
President’s Leadership Council 3
Printmaking Concentration 54
Procedural Appendix to the Undergraduate Academic Code of Honor 18
Professional Societies 118
Program of Liberal Studies 80
Psychology 81

Q
Quantitative Reasoning 16

R
Religion and Literature 100
Requirements, Arts and Letters 49
Research 20
Reserve Officers Training Corps (ROTC) 28
Air Force 29
Army 28
Marine Corps 28
Navy 28
Residential Life 11
Romance Languages and Literatures 82
Russian Language and Literature 67
Russian Program 68
Russia Study Abroad Programs
Moscow 33
St. Petersburg 33
Vladimir 33
Rwanda: Kigali Study Abroad Program 33
Saint Mary’s College 36
Sara Bea Center For Students With Disabilities 22
SAT I 22
Scholarships and Grants 24, 25
Science
College of 136
Degree Credit 167
Preprofessional Program (SCPP) 161
Science and Technology 16
Science-Business Collegiate Sequence 163
Science-Computing Collegiate Sequence 164
Science-Education Collegiate Sequence 165
Science, Special Opportunities 140
Science, Technology, and Values 100
Sculpture Concentration 54
Selection Process 21
Singapore Study Abroad Program 33
Smart Women Securities at Notre Dame 107
Snite Museum of Art 20
Social Sciences 16
Sociology 86
South Africa: Stellenbosch Study Abroad Program 34
South Korea: Seoul Study Abroad Program 34
Spain Study Abroad Programs
Alcoy 34
Toledo 34
Spanish 84
Spirit of Inclusion at Notre Dame 13
Spiritual Life 11
Stafford Loan 25
Standards of Progress for Recipients of Financial Aid 26
Student Affairs, Division of 11
Student Awards and Prizes 42, 46, 105, 116, 139
Student Conduct 12
Student Employment 25
Student Financial Aid 24
Student Government Board 12
Student International Business Council 107
Student Life 11
Student Organizations 43, 138
Business Oriented 106
Students Consulting for Nonprofit Organizations Notre Dame 107
Student Senate 12
Students with Disabilities 22
Studio Art and Design 54
Studio Art Concentration 54
Study Abroad Programs 29, 46

Australia
Fremantle 30
Perth 30
Sydney 30

Chile
Santiago 30

China
Beijing 31
Hong Kong 31
Shanghai 31

Denmark
Copenhagen 31

Domestic Off-Campus Programs 35
California Silicon Valley 35
The Washington Program 35

France
Angers 31
Paris 31

Germany
Berlin 31
Heidelberg 32

Greece
Athens 32

India
Mumbai 32

Ireland
Dublin 32
Galway 32

Israel
Jerusalem 32

Italy
Bologna 32
Rome 32
AME Program 32
ICCS Program 32

Japan
Nagoya 33
Tokyo 33

Jordan
Amman 33

Mexico
Puebla 33

Morocco
Rabat 33

Russia
Moscow 33
St. Petersburg 33
Vladimir 33

Singapore 33

South Africa
Stellenbosch 34

South Korea
Seoul 34

Spain
Alcoy 34
Toledo 34

Switzerland
Geneva 34

United Kingdom
London 34
Norwich 34
Oxford 34
St Andrews 34
with College of Engineering 114

Teaching English to Speakers of Other Languages 100
Testing 21
Theology 16, 89
TOEFL (Test of English as a Foreign Language) 22
Transfer Students 22
Transnational European Studies 133
Trustees, Board of 4
Trustees Emeriti 4
Tuition and Fees 24

UNDERC Field Biology Programs 146
Undergraduate Academic Code 18
Undergraduate Women in Business (UWIB) 107
United Kingdom Study Abroad Programs
London 34
Norwich 34
St. Andrews, Scotland 34
University Requirements 15
University Seminar 16
Unleashed 107

Veterans Educational Benefits 25
Vision for Undergraduate Education 11
Visual Communication Design 55
W
Waiting List 21
Wall Street Club 107
Washington, D.C. Study Abroad
  Domestic Off-Campus Programs
    The Washington Program 35
Writing 16
Writing Center Consultations 19
Writing Requirement 45