The Graduate School

Centers, Institutes, and Laboratories
26 Alliance for Catholic Education
26 Center for Applied Mathematics
26 Center for Astrophysics
27 Center for Environmental Science and Technology
27 Center for Molecularly Engineered Materials
29 Center for Nano Science and Technology
30 Center for Philosophy of Religion
30 Center for Tropical Disease Research and Training
31 Charles and Margaret Hall Cushwa Center for the Study of American Catholicism
32 Erasmus Institute
32 Hesstert Center for Aerospace Research
32 Institute for Church Life
34 Institute for Educational Initiatives
35 Institute for Latino Studies
35 Kaneb Center for Teaching and Learning
35 W.M. Keck Center for Transgene Research
36 Kellogg Institute for International Studies
37 KEOUGH INSTITUTE FOR IRISH STUDIES
38 Joan B. Kroc Institute for International Peace Studies
38 Keough Institute for Irish Studies
39 Medieval Institute
39 Nanovic Institute for European Studies
40 Radiation Laboratory
40 John J. Reilly Center for Science, Technology, and Values
42 South Bend Center for Medical Education
42 Walther Cancer Research Center

The Division of Humanities
66 Art, Art History, and Design
71 Classics
73 Early Christian Studies
74 East Asian Languages and Literatures
75 English
80 German Language and Literature
84 History
89 History and Philosophy of Science
96 Medieval Studies
105 Music
108 Ph.D. Program in Literature
110 Philosophy
117 Romance Languages and Literatures
122 Theology

The Division of Science
136 Biological Sciences
141 Chemistry and Biochemistry
144 Mathematics
150 Physics
162 Interdisciplinary Programs

The Division of Social Sciences
167 Economics
171 Government and International Studies
180 Peace Studies
184 Psychology
193 Sociology
200 Master of Education (M.Ed.) Program

The School of Architecture

The Division of Engineering
47 Aerospace and Mechanical Engineering
51 Chemical Engineering
54 Civil Engineering and Geological Sciences
58 Computer Science and Engineering
61 Electrical Engineering
65 Engineering and Law Dual Degree Program

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The Graduate School

As a Catholic research university, the University of Notre Dame offers first-rate academic training in an environment that addresses questions of value and meaning. We are committed to making quality the hallmark of our superb Graduate School, well focused in its mission. Our intent is to allow faculty to invest in the lives of a few gifted graduate students, equipping them to pass on a vision of inquiry, scholarship, teaching, and service.

Over the last two decades, Notre Dame has made dramatic advances in building a distinguished faculty. Ongoing investment in facilities also invigorates the University’s graduate programs. For more than a decade major construction projects have added new campus buildings to provide classrooms, faculty offices, and research facilities in the sciences, engineering, humanities, and social sciences.

Notre Dame has a pivotal role to play as a Catholic center of learning, a place that welcomes the intellectual ferment of a university while encouraging its faculty—in a variety of disciplines and from diverse perspectives—to address ultimate questions, religious foundations, and ethical dilemmas.

History
Located north of the city of South Bend, Indiana, the University of Notre Dame, a Holy Cross institution, was founded in 1842 by the Rev. Edward F. Sorin, a priest of the Congregation of Holy Cross. In 1844 it was chartered by a special act of the legislature of the State of Indiana. Combing the style of the French “college” and the seminary in which Father Sorin and his associates were educated, Notre Dame began as both a secondary school and a four-year college offering the baccalaureate degree in the liberal arts. It soon adapted to the style and structure of the typical 19th-century American university, introducing a science curriculum in 1865, the first American Catholic Law School in 1869, an Engineering College in 1873, a graduate program in 1918, and a College of Business in 1921. The University was first accredited by the North Central Association in 1913.

Administration
From 1918 to the present, the University’s Graduate School has developed into four divisions—humanities, social sciences, science, and engineering—and the School of Architecture, and includes thirty departments and programs offering master’s and/or Ph.D. degrees in most of the major humanistic, scientific, and engineering disciplines.

Administered originally by a graduate committee of faculty members, the Graduate School was organized formally in 1944 with a graduate dean and Graduate Council. In 1971, the newly created position of vice president for advanced studies underlined the University’s intense focus on building quality in the graduate programs. Since 1990, the Graduate School has been administered by a vice president for graduate studies and research, assisted by several associate and assistant deans and the Graduate Council.

The University’s total student population of more than 10,000 includes about 1,400 graduate students and 1,000 professional students. Approximately 800 graduate and professional degrees are awarded annually.

Catholic Character
Father Edward Malloy, Notre Dame’s president since 1987, has used these words to describe the University’s Catholic character:

“From its founding in 1842 until the present Notre Dame has self-consciously and proudly proclaimed itself to be a Catholic university. In one sense, this distinguishes it from other colleges and universities which are secular or nondenominational in origin and/or present institutional identity. This reference to Catholicity builds on a historical connection to the Roman Catholic Church and its cultivation of the great transcendental values of truth, beauty, and goodness. It presupposes that a life given over to learning and scholarship can be a valid route to God.

“In another sense, Notre Dame’s Catholic character is a call to be a welcoming place, a kind of extended family where individuals from all backgrounds and of every faith can both feel at home and be prized for the special contribution that they make. It is a call to cultivate a spirit of honest and open exchange, always in a valuing context.

“Notre Dame . . . tries to attend to the whole person—intellectual, moral, and spiritual.”
Graduate Degrees Granted

Master of Architecture
Master of Arts in the following fields:
  Art History, Design, and Studio Art
  Early Christian Studies
  Economics
  English
  French and Francophone Studies
  German Language and Literature
  Government and International Studies
  History
  History and Philosophy of Science
  Iberian and Latin American Studies
  Italian Studies
  Literature
  Music
  Peace Studies
  Philosophy
  Psychology
  Sociology
  Theology
Master of Divinity
Master of Education (only for students in the Alliance for Catholic Education program)
Master of Engineering (only with J.D.)
Master of Engineering in Mechanical Engineering
Master of Fine Arts in the following fields:
  Creative Writing
  Design
  Studio Art
Master of Medieval Studies
Master of Music
Master of Science:
  Aerospace and Mechanical Engineering
  Applied Mathematics
  Bioengineering
  Chemical Engineering
  Civil Engineering
  Computer Science and Engineering
  Electrical Engineering
  Environmental Engineering
  Mechanical Engineering
Master of Science in the following fields:
  Biochemistry
  Biological Sciences
  Biophysics
  Chemistry
  Geological Sciences
  Mathematics
  Physics
Master of Theological Studies
Doctor of Philosophy in the following fields:
  Aerospace and Mechanical Engineering
  Biochemistry
  Biological Sciences
  Biophysics
  Chemical Engineering
  Chemistry
  Civil Engineering and Geological Sciences
  Computer Science and Engineering
  Economics
  Electrical Engineering
  English
  Government and International Studies
  History
  History and Philosophy of Science
  Literature
  Mathematics
  Medieval Studies
  Philosophy
  Physics
  Psychology
  Sociology
  Theology

Areas and Fields of Study

The University of Notre Dame offers graduate programs leading to master’s and/or doctoral degrees in the following areas and fields of study:

Aerospace and Mechanical Engineering
  Aerospace Sciences
    Aeroacoustics
    Aero-optics
    Aerospace Structural Design
    Aerospace Systems Design
    High-Lift Aerodynamics
    Low Reynolds-Number Aerodynamics
    Low Speed Aerodynamics
    Particle Dynamics
    Transonic, Supersonic, Hypersonic Flows
    Vortex Aerodynamics
  Mechanical Systems and Design
    Computer Aided Design and Manufacturing
    Design for Manufacturing
    Design Optimization
    Dynamic and Control Systems
    Mechanism and Machine Theory
    Robotics
    Tribology
  Solid Mechanics
    Biomechanics
    Composite Materials
    Environmental Assisted Cracking
    Fatigue
    Fluid/Structure Interaction
    Fracture Mechanics
    Manufacturing Processes
    Mechanics of Porous Media
    Plasticity
    Structural Stability
    Thermal and Fluid Sciences
    Boundary Layer Phenomena
    Chaos in Fluid Systems
  Computational Fluid Mechanics
  Detonation Theory
  Droplet Sprays
  Fire Research
  Fluid/Structure Interaction
  Flow Control
  Food Processing Technology
  Hydrodynamic Stability
  Hydronics
  Industrial Energy Conservation
  Microfluid Mechanics
  Molecular Dynamics
  Multiphase and Buoyant Flows
  Reacting Flows
  Solidification of Liquid Metals
  Turbulent Flows

Architecture*
  Architectural Design
  Classical Theory in Architecture and Urbanism
  History and Theory
  Urban Theory and Design

Art, Art History, and Design
  Studio Art+
    Ceramics
    Photography
    Printmaking
    Sculpture
  Art History*
    American
    Ancient
    Contemporary
    Medieval
    Modern European
    Renaissance and Baroque
  Design+
    Graphic Design
    Industrial Design

Biological Sciences
  Animal Behavior
  Aquatic Biology
  Biotechnology
  Cell and Molecular Biology
  Developmental Biology
  Ecology
  Environmental Biology
  Evolutionary and Systematic Biology
  Genetics
  Medical Entomology
  Microbial Physiology
  Neural Biology
  Parasitology
  Physiology
  Vector Biology

Chemical Engineering
  Applied Mathematics
  Bioseparations
  Catalysis and Surface Science
  Ceramics
  Chemical Reaction Engineering
  Combustion Synthesis of Materials
  Ecological Modeling
Areas and Fields of Study

Systems and Networks

Economics
Development and
International Economics
Economic Theory, Economic Thought, and Methodology
Institutions (labor, financial, industrial, and public)

Electrical Engineering
Communication Systems
Control Systems
Nanoelectronics
Optoelectronics
Semiconductor Materials and Devices
Signal and Image Processing
Solid-State Integrated Circuits

English
Old and Middle English
Renaissance
Restoration and 18th Century
Romantic and Victorian
Modern British
American to 1900
Modern American
African American
Irish Studies
Drama
Novel
Poetry
Prose Fiction
Literary Theory
Creative Writing++

German Language and Literature*
The Medieval Period
Reformation and Humanism
German Classical Literature
Goethe and His Age
19th-century Drama and Prose
Contemporary German Prose
Modern Lyric Poetry
Aesthetics and Ethics
Philosophy and Literature
Drama and the Theory of Drama
Intellectual History

Government and International Studies
American Government and Politics
(including public law)
Comparative Politics
International Relations
Political Theory

History
Medieval History
Modern European History
United States History

History and Philosophy of Science
History of the Philosophy of Science
Analytic Philosophy of
Science and Epistemology
History and Philosophy of
Biology 1700 to 1980
Philosophy of Contemporary Physics
History of Astronomy and Physics
Medieval Natural Philosophy

and Medicine
History and Philosophy of Economics
Philosophy of Mind and Neuroscience
Social History of Medicine
and Technology
History and Philosophy of Mathematics
Intellectual History of
Science 1600 to 1950
Scientific Revolution Studies
Science and Literature

Literature

Mathematics
Algebra
Algebraic Geometry
Applied Mathematics
Complex Analysis
Differential Geometry
Logic
Partial Differential Equations
Topology

Medieval Studies
Art
Comparative Literature
Medieval History
Medieval Literatures
Music
Philosophy
Theology

Music*
Music Theory
Musicology
Performance and Literature

Peace Studies*
The Role of International Norms and Institutions in Peacemaking
The Impact of Religious, Philosophical, and Cultural Influences on Peace
The Dynamics of Inter-Group Conflict and Conflict Transformation
The Promotion of Social, Economic, and Environmental Justice

Philosophy
Ancient Philosophy
Contemporary European Philosophy
Epistemology
Ethics
Logic
Medieval Philosophy
Metaphysics
Modern Philosophy
Philosophy of Language
Philosophy of Mathematics
Philosophy of Mind
Philosophy of Religion
Philosophy of Science
Political Philosophy

Physics
Astrophysics
Atomic Physics
Condensed Matter Physics
Elementary Particle Physics
Nuclear Physics
Pattern Formation/Biophysics
Theoretical Physics
Psychology
- Cognitive Psychology—Educational Applications, Memory, Problem-Solving
- Counseling Psychology
- Developmental Psychology—Cognitive Development, Socioemotional Development, Developmental Psychopathology
- Quantitative Psychology
Romance Languages and Literatures*
- Comparative Literatures
- French and Francophone Studies—Middle Ages, Renaissance, 17th-century Classical, 18th-century Enlightenment, 19th Century, 20th Century
- Italian Studies—Italian Literature: Medieval, Renaissance, Modern; Art History; Architectural History; Film Studies; Translation; History; Philosophy; Music
- Iberian and Latin American Studies—Medieval, Golden Age, Colonial Spanish-American, Modern Spanish Peninsular, Modern Spanish-American Periods; Gender Studies
Sociology
- Comparative Historical Sociology
- Family
- Organizations
- Political Sociology
- Race and Ethnicity
- Research Methods and Statistics
- Social Psychology
- Social Theory
- Sociology of Culture
- Sociology of Education
- Sociology of Religion
Theology
- Biblical Studies*
- Christianity and Judaism in Antiquity—Hebrew Bible and Judaica, New Testament and Early Church
- Early Christian Studies*
- History of Christianity—Early Church, Medieval Studies, Reformation Studies, Modern Studies
- Liturgical Studies
- Moral Theology/Christian Ethics
- Systematic Theology
- Professional Studies (Master of Divinity Program)
- Theological Studies*

* Master’s programs only
+ Master’s program and M.F.A. in studio art and design
++ M.F.A. in creative writing

Academic Policies of the Graduate School

Please note: The University reserves the right to change its admission, registration, and graduation requirements as necessary.

The following represents the minimum standards established by the Graduate School. Individual departments may require higher standards. Students are expected to be fully cognizant of their department’s requirements.

No exceptions to the following policies and procedures will be valid without the formal written approval of the Graduate School.

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 will be made to provide advance information of any changes.

Admission to the Graduate School

Admission to the Graduate School is highly competitive. An applicant for admission to the Graduate School must hold a bachelor’s degree or its equivalent from an accredited American college or university or from a foreign institution of acceptable standing. Applicants are admitted on the presumption that they will hold the bachelor’s degree by the time of graduate matriculation. If at that time they do not hold a bachelor’s degree, the Graduate School admission is void. The applicant should have earned at least a B average in his or her undergraduate major courses and should meet the level of academic achievement that implies a developed ability for advanced study and independent scholarship.

An applicant may seek admission in either degree or nondegree status. A degree applicant may seek admission to either a master’s or doctoral program. Only degree students may be candidates for a degree at Notre Dame.

It should also be understood that admission to the master’s program does not automatically mean admission to the doctoral program upon completion of the master’s program. A separate decision is required for continuation in the doctoral program.

An applicant for admission to a degree program is required to submit:
1. one completed “Application for Admission and Financial Aid” form or an online application;
2. one completed “Statistical Information and Application Fee” form (paper application) or Signature Page (online application);
3. two official transcripts from each postsecondary institution attended (If the student has attended an institution in which the primary language of instruction has not been English, an official translation of the transcript and diploma is required in addition to the official transcripts. When possible, transcripts should be sent directly to the Graduate School by the institution.);
4. scores in the General Test (verbal, quantitative, and analytical) of the Graduate Record Examination;
5. scores in the appropriate Subject Test of the Graduate Record Examination, if the department requires it;
6. two copies each of three letters of recommendation and signed waiver forms from former undergraduate or graduate teachers particularly qualified to attest to the applicant’s qualification for graduate study;
7. two copies of a personal Statement of Intent detailing graduate study plans and expectations;
8. scores from the TOEFL (Test of English as a Foreign Language) if English is not the applicant’s native language or was not the language of instruction for the applicant’s baccalaureate degree; and
9. the application fee.

Students seeking admission to more than one department, but who plan to enroll in only one, must submit separate applications for each department. Only one application fee is necessary.

Beyond these Graduate School admission requirements for all graduate departments and programs, particular programs may require personal interviews and/or submission of special materials.

The Graduate Record Examination (GRE) is offered several times each year at sites in the United States and abroad. The annual
Admission to the Graduate School

Admission to Multiple Degree Programs
An applicant who seeks admission to more than one master’s degree program in the Graduate School in order to earn two degrees, or an applicant who seeks admission to a degree program in the Graduate School concurrently with a degree program in another school in the University (i.e., Law School or College of Business) must submit a separate and complete application for each program. The applicant must also be accepted by each of the cooperating departments. The Graduate School will consider only applicants whose past academic performance indicates the potential for success in each of the programs. In consultation with the appropriate advisers from each unit, the applicant will select a plan of study acceptable to all units. The Graduate School must approve the written plan of study before the student may begin the program. No more than nine credit hours of classes may be counted toward both degrees.

Admission to Joint Degree Programs
It is possible for a student to pursue a program of study combining two programs and leading to a joint degree. An applicant who seeks to earn a joint degree, either master’s or Ph.D., must submit a separate and complete application to each program and be accepted by both. The relevant departments must agree upon a plan of study defining what will constitute the joint degree program, and the approved written plan must be on file with the Graduate School before the student may begin the program.

The application fee must accompany the application. This fee is nonrefundable. The fee is $50 for all applications submitted after December 1 for admission to the following fall semester. For applications submitted by December 1 for admission to the following fall semester, the application fee is $35. Fees must be paid by check or money order.

Unless otherwise specified, the application deadline is February 1 for admission and financial aid for the fall semester, and November 1 for the spring semester, though some departments have earlier deadlines. Only a few departments offer spring admission; therefore, applicants who wish to begin in the spring are advised to consult the department.

Acceptance
Official acceptance to the Graduate School in the academic year is granted only by the associate dean. Applicants will be informed officially of the results of their application by a letter from the associate dean for graduate admissions. Applicants who intend to accept offers of admission are required to confirm their acceptance by returning the appropriately completed form that is supplied with an offer of admission.

A student whose degree program begins or continues in the summer must complete a summer session course selection form.

An applicant for admission to a nondegree program is required to submit one completed Graduate School application and two official transcripts from each postsecondary institution attended. (When possible, transcripts should be sent directly to the Graduate School by the institution.) Particular departments may require personal statements detailing the applicant’s graduate plans and expectations.

A nondegree applicant may seek admission as a departmental nondegree student or as an unclassified, visiting, or auditing student in the Graduate School.

A departmental nondegree student is one who has been admitted to a department but does not seek an advanced degree from the University. An applicant with degree intent who lacks one or more admission requirements may be admitted temporarily to nondegree status at the discretion of the department and with the approval of the associate dean for graduate admissions. The student may register for one to 12 credit hours in any graduate courses for which he or she meets the course prerequisites. However, no student initially admitted to nondegree status will be admitted to degree status until all admission requirements have been satisfied. No more than 12 credit hours earned by a student while in a nondegree status may be counted toward a degree program. Admission as a departmental nondegree student does not guarantee later admission as a degree-seeking student.

An unclassified student is one who is admitted to the Graduate School in a nondegree status, but who is not a member of a particular department. Such a student may, with the approval of the Graduate School, take courses in any graduate department, subject to approval by the department. This category is usually open to nondegree students who wish to take courses in more than one department or students who have completed their degree programs, but wish to continue in the University in graduate student status. No more than 12 credit hours earned by a student while in a nondegree status may be counted toward a degree program. Admission as an unclassified nondegree student does not guarantee later admission as a degree-seeking student.

A visiting student is normally a degree student in another university who enrolls for credit in selected courses at Notre Dame. Unless otherwise arranged by the home university and Notre Dame, the visiting student is considered a nondegree student at Notre Dame and follows the same application and enrollment procedures as a nondegree student.

An auditor is a nondegree student who meets the course prerequisites but receives no academic credit. With the permission of the instructor and the department chair, a degree student also may audit courses. Audited courses may be recorded on a student’s permanent record only if the student requests the instructor to record it at the beginning of the semester and if he or she attends the course throughout the entire semester. A recorded audit is graded V. Incomplete audits are not recorded. The audit grade of V cannot be changed to a credit grade.

In the academic year, full-time graduate students may audit courses without charge. Part-time graduate students who audit courses will be charged the normal audit fee of one-half the current credit hour fee.
In the summer session, there is no free audited course. Any course taken or audited in the summer session will be charged the full price.

Postdoctoral Scholars

Postdoctoral Research Associates

Appointments to non-faculty research positions with the title Senior Research Associate, Postdoctoral Research Associate, or Research Associate are made by the Graduate School in departments, institutes, and centers throughout the University. The length of appointment varies but is normally for one year; renewal is upon mutual agreement between the appointee and the faculty advisor. Research associates receive salary and substantial benefits. Application should be made directly to the faculty member with whom the applicant wishes to pursue studies.

Visiting Scholars

Appointments to non-faculty research positions with the title Visiting Scholar are made by the Graduate School in departments, institutes, and centers throughout the University. The length of appointment varies but is normally for one year; renewal is upon mutual agreement between the appointee and the chair/director of the appointing unit. Visiting scholars receive no salary and only limited benefits. Application should be made directly to the chair/director of the appropriate unit.

Teaching Scholars

Appointments to non-faculty teaching positions with the title Teaching Scholar are made by the Graduate School in departments throughout the University. The length of appointment is normally for one year; renewal may be for up to three years upon mutual agreement between the appointee and the department chair. Teaching scholars receive salary and substantial benefits. Application should be made directly to the chair of the appropriate department.

Visiting Research Students

The Graduate School appoints students enrolled in Ph.D. programs at other institutions to research positions with the title Visiting Research Student for the purpose of using University libraries or consulting with a faculty member. The length of appointment varies but is normally for a semester or a year. Visiting research students occasionally receive a stipend; they pay no tuition unless they enroll in courses. Application should be made directly to the faculty member the student wishes to consult, or to the chair of the appropriate department.

Enrollment in the University

Once admitted, all degree and nondegree graduate students must enroll before each semester at the times and locations announced by the University Registrar. Enrollment dates are published in the Graduate School calendar (see end of this Bulletin).

Any admitted student who fails to enroll for one semester or more must apply for readmission upon return. (See “Continuous Enrollment,” below.)

Full-time and Part-time Status

A full-time student is one who is working full time toward his or her degree objective. The student’s department is responsible for determining who is a full-time student, and who is otherwise a part-time student.

A nondegree student, however, must register for at least nine credit hours per semester, or six in the summer session, to claim full-time status.

All degree-seeking students are expected to maintain full-time status and to devote full time to graduate study. No degree student may hold a job, on or off campus, without the express permission of his or her department and the Graduate School.

Academic Good Standing

Continuation in a graduate degree program, admission to degree candidacy, and graduation require maintenance of at least a 3.0 (B) cumulative grade point average (G.P.A.). A student may be dismissed from the department or program if the G.P.A. in any one semester is below 2.5 or if the G.P.A. is below 3.0 for two consecutive semesters. Some departments require higher averages for enrollment and support continuance.

An adequate G.P.A. is only one factor taken into consideration in determining a student’s qualifications for an advanced degree. Degree students should be aware of their department’s performance criteria. The department and the Graduate School annually evaluate each graduate student’s overall performance on the basis of these criteria.

A student must be in academic good standing to be eligible for new or continued financial support.

Continuous Enrollment

All students must enroll each semester in the academic year and register for at least one credit hour per semester to maintain student status. Continuous enrollment is met normally by both enrollment in the University and registration in a graduate-level course relevant to the student’s program. A student who is concurrently pursuing degrees in the Graduate School and in another school in the University meets the continuous enrollment requirement by registering for a course in either program. Any exception to this rule, including a leave of absence, must be approved by the Graduate School. (See “Leave of Absence,” below.) Degree students who have completed the course work requirement for their degree must register for at least one credit hour per semester, including the final semester or summer session in which they receive their degree. These students may be considered full-time students whether or not they are in residence. Students not in residence and taking one credit hour pursuant to continuous enrollment requirements are charged a special registration fee.

A student who fails to enroll and register for one semester or more must apply for readmission upon return.

Continuing students (i.e., degree-seeking students who are eligible to continue their studies in the fall semester) may have access to University facilities and services from May through August without enrolling and registering for academic credit in the summer session.

Leave of Absence

For exceptional reasons and on the recommendation of the department, a student in good academic standing may request a leave of absence for a maximum of two consecutive semesters. A request for a leave of absence must be made before the semester in which the leave is taken, and all leaves of absence must be approved by the Graduate School. If, for some urgent reason, a student is allowed to leave the University after the beginning of the semester, the withdrawal procedure below must be followed. If at the end of the leave of absence period the student does not return, the student is considered terminated. Application for readmission is
required if the student wishes to return.

In the case of a medical leave of absence, clearance from the University Health Center is required prior to readmission.

**Withdrawal from the Program**

To withdraw from the University before the end of the semester, a student must inform the department and the Graduate School as well as complete the notice of withdrawal in the Office of the Registrar, 105 Main Building. For information on refunds, refer to “Tuition and Expenses.”

Upon approval of the withdrawal, the University enters a grade of W for each course in which the student was registered. If a student drops out of the University without following the procedure described above, a grade of F is recorded for each course.

The credit for any course or examination will be forfeited if the student interrupts his or her program of study for five years or more.

The University reserves the right to require the withdrawal of any student when academic performance, health status, or general conduct may be judged clearly detrimental to the best interests of either the student or the University community.

**Maximal Registration**

During each semester of the academic year, a graduate student should not register for more than 12 credit hours of graduate courses, i.e., the 500–, 600– and 700–level courses. In the summer session, a graduate student should not register for more than 10 credit hours.

**Course Numbers**

Courses numbered 500 through 599 are first-level graduate courses into which qualified advanced undergraduates may be admitted with the permission of the instructor and the approval of the chair. Courses numbered 600 and above are advanced graduate courses open only to those who have completed the undergraduate and graduate prerequisites.

The advanced undergraduate courses numbered 400 through 499 may, with the approval of the department chair and the Graduate School, be taken to satisfy up to 10 hours of graduate credit requirements.

Departments may place additional constraints on the use of 400–level courses to meet their degree requirements.

No graduate credit is allowed for courses below the 400 level.

**Changes in Student Class Schedule**

A student may add courses only during the first seven class days of the semester. A student may add courses after this time only on recommendation of the department and with approval of the Graduate School.

A student may drop courses during the first seven class days of the semester. To drop a course after this period and up to the midsemester point (see the Graduate School calendar for the exact date), a student must have the approval of the chair of the department offering the course, of his or her adviser, and of the Graduate School; however, no tuition adjustment will be made after the seventh class day of the semester. A course may be dropped after the midsemester point only in cases of serious physical or mental illness. Courses dropped after this date will be posted on the student’s permanent record with the grade of W.

A course taken for credit can be changed to an audit course after the midsemester point only in cases of serious physical or mental illness.

**Graduate Grades**

Listed below are graduate grades and the corresponding number of quality points per credit hour.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
</tr>
<tr>
<td>A-</td>
<td>3.667</td>
</tr>
<tr>
<td>B+</td>
<td>3.333</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
</tr>
<tr>
<td>B-</td>
<td>2.667</td>
</tr>
<tr>
<td>C+</td>
<td>2.333</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
</tr>
<tr>
<td>I</td>
<td>0 (Until Incomplete is removed)</td>
</tr>
<tr>
<td>NR</td>
<td>Not reported</td>
</tr>
<tr>
<td>S</td>
<td>None Satisfactory</td>
</tr>
<tr>
<td>U</td>
<td>None Unsatisfactory</td>
</tr>
<tr>
<td>V</td>
<td>None Auditor (graduate students only)</td>
</tr>
<tr>
<td>W</td>
<td>None Discontinued with permission</td>
</tr>
</tbody>
</table>

Quality point values are used to compute the student’s G.P.A. The G.P.A. is the ratio of accumulated earned quality points to the accumulated earned semester credit hours. G.P.A. computation takes into account only those grades earned in Notre Dame graduate courses by students with graduate status at Notre Dame. For courses taken in a department or college in the University but outside the Graduate School, or taken outside the University, the grade will not be included in the G.P.A. computation.

The grades of C- and D are not awarded in the Graduate School.

A student receives the temporary grade of I when, for acceptable reasons, he or she has not completed the requirements for a 500- or higher-level graduate course within the semester or summer session. No grade of I can be given for courses below the 500 level or to graduating students in the final semester or final summer session.

The student then must complete the course work for a grade prior to the beginning of the final examination period of the next semester in which the student is enrolled. If a student receives an I for a summer session course, he or she must complete the course work for a grade before the final examination period begins for the next semester or summer session (whichever comes first) in which the student is enrolled.

The University temporarily computes this grade as the equivalent of an F in calculating the G.P.A. When the student fulfills the above requirements, the I is replaced by the new grade. Should the student not complete the course work as required, the I remains on the academic record and is computed in the G.P.A. as equivalent to an F.

The department and the Graduate School will review a student who receives more than one I in a semester or an I in two or more consecutive semesters, to determine his or her eligibility for continued support and enrollment.

The grades of S and U are used in courses without semester credit hours, as well as in research courses, departmental seminars, colloquia, workshops, directed studies, field education, and skills courses. These courses, if given the grade of S, do figure in a student’s earned semester credit-hour total but do not figure in the computation of the G.P.A. A grade of U will not count toward the student’s earned semester credit-hour total, nor will it figure in the computation of the G.P.A.
The grade of V has neither quality-point nor credit-hour value. It is the only grade available to the registered auditor who requests at the beginning of the semester that it be made part of his or her permanent record and who attends the course throughout the entire semester. The grade of V cannot be changed to a credit-earning grade.

The grade of W is given for a course that a student is allowed to drop after the midsemester point.

**Transfer Credits**
A department may accept course work completed at another accredited university toward meeting its degree requirements. A student may transfer credits earned at another accredited university only if: (1) the student is in degree status at Notre Dame; (2) the courses taken are graduate courses appropriate to the Notre Dame graduate program and the student had graduate student status when he or she took these courses; (3) the courses were completed within a five-year period prior to admission to a graduate degree program at Notre Dame or while enrolled in a graduate degree program at Notre Dame; (4) grades of B (3.0 on 4.0 scale) or better were achieved; and (5) the transfer is recommended by the department chair and approved by the Graduate School.

These five requirements also apply to the transfer of credits earned in another program at Notre Dame.

The University considers a request for credit transfer only after a student has completed one semester in a Notre Dame graduate degree program and before the semester in which the graduate degree is conferred. The university of origin must submit two transcripts directly to the Notre Dame Graduate School. Credits not earned on the semester system, such as trimester and quarter-hour credits, will be transferred on a pro rata basis.

A student transferring from an unfinished master’s program may not transfer more than six semester credit hours into either a Notre Dame master’s or Ph.D. program.

If the student has completed a master’s or Ph.D. program, he or she may transfer up to nine semester credit hours to a Notre Dame master’s program and up to 24 semester-credit hours to a Notre Dame Ph.D. program.

Occasionally, a student may need to do dissertation research at another institution. Normally, the student would register for the appropriate number of credit hours of research at Notre Dame. If the student does not enroll at Notre Dame and expects to count research hours earned elsewhere toward the Notre Dame degree, the student must have the approval of the department and the Graduate School in advance. The University requires similar prior approval for formal courses taken elsewhere and applied to the degree program. Twenty-four credit hours, including research credit hours, is the maximum acceptable for transfer into a Notre Dame doctoral program.

No grades of transferred courses are included in the student’s G.P.A.

**Examinations**
Unexcused absence from a scheduled final examination results in an F. An absence excused in advance results in an I (incomplete).

**Academic Integrity**
Integrity in scholarship and research is an essential characteristic of our academic life and social structure in the University. Any activity that compromises the pursuit of truth and the advancement of knowledge besmires the intellectual effort and may undermine confidence in the academic enterprise. A commitment to honesty is expected in all academic endeavors, and this should be continuously emphasized to students, research assistants, associates, and colleagues by mentors and academic leaders.

The procedures for ensuring academic integrity in the Graduate School are distinct from those in the Undergraduate Code of Honor.

Violations of academic integrity may occur in classroom work and related academic functions or in research/scholarship endeavors. Classroom-type misconduct includes the use of information obtained from another student’s paper during an examination, plagiarism, submission of work written by someone else, falsification of data, etc. Violation of integrity in research/scholarship is deliberate fabrication, falsification, or plagiarism in proposing, performing, or reporting research or other deliberate misrepresentation in proposing, conducting, reporting, or reviewing research. Misconduct does not include errors of judgment, errors in recording, selection, or analysis of data, differences in opinions involving interpretation, or conduct unrelated to the research process. Misconduct includes practices that materially and adversely affect the integrity of scholarship and research.

Any person who has reason to believe that a violation of this policy has occurred shall discuss it on a confidential basis with the department chair or director of the appropriate institute. If a perceived conflict of interest exists between the chair/director and the accused, the next highest academic officer shall be notified of the charge. The chair/director shall evaluate the allegation promptly. If it is determined that there is no substantial basis for the charge, then the matter may be dismissed with the fact of dismissal being made known to the complainant and to the accused if he or she is aware of the accusation. A written summary of charges, findings, and actions shall be forwarded to the vice president for graduate studies and research as a matter of documentation. Otherwise, the chair will select an impartial panel consisting of three members, one of whom may be a graduate student, to investigate the matter. The chair will inform the accused of the charges. The panel will determine initially whether to proceed directly to a hearing to further investigate the case, or to dismiss the charges. If the panel decides to proceed directly to a hearing, the hearing will be held within 10 days of the original notification. If the panel decides that further investigation is necessary, it shall immediately notify the chair. If it decides that a hearing is not warranted, all information gathered for this investigation will be destroyed. The utmost care will be taken to minimize any negative consequence to the accused.

The accused party must be given the opportunity to respond to any and all allegations and supporting evidence at the hearing. The response will be made to the appointed panel. The panel will make a final judgment, recommend appropriate disciplinary action, and report to the chair in writing. The report will include all of the pertinent documentation and will be presented within 30 days after meeting with the accused. Copies of the report are to be made available to the accused, the chair, and the vice president. If a violation is judged to have occurred, this might be grounds for dismissal from the University; research/scholarship violations might be reported to the sponsor of the research effort (e.g., NSF, NIH, Lilly Foundation, etc.), if appropriate.
If the student chooses to appeal, he or she must address the appeal in writing to the vice president for graduate studies and research within 10 days. The student has the right to appear before the vice president or his or her delegate. The vice president may decide to appoint an ad hoc committee to handle this appeal, if deemed necessary.

Violations of academic integrity by individuals who are not students are governed by different rules; students who are working on externally sponsored programs may also be covered by sponsor-mandated rules. Contact Dr. Richard A. Hilliard, director of research compliance, (219) 631–5386, for further information.

Academic Counselor

The vice president for graduate studies and research has appointed an academic counselor in the Graduate School to be available to graduate students who want to confidentially discuss problems they are having in their programs. The counselor can help a student decide how to resolve the problem. The Graduate School’s academic counselor is Dr. Barbara M. Turpin, associate dean.

Requirements for the Master’s Degree

In addition to the following Graduate School requirements, individual departments may have higher standards. Students are expected to know their departmental requirements.

Credit Hours

The number of semester credit hours of course work for the master’s degree is specified by the student’s department. Students in a research program must also complete the research requirements of their department. (See also “Transfer Credits,” above.)

Residency

The minimum residency requirement for the master’s degree is registration in full-time status for one semester during the academic year or for one summer session.

Foreign Language Requirement

The Graduate School does not require foreign language reading proficiency for the master’s degree. However, some departments do have this requirement. Students should consult their departments concerning this requirement.

Degree Eligibility

Failure to complete all requirements for the master’s degree within five years results in forfeiture of degree eligibility.

A master’s program that is pursued during the summer and the academic year must also be completed within five years.

A student attending summer session only must complete all requirements within seven years.

Advisers and Thesis Directors

Each student is assigned an adviser from the time of enrollment. This may initially be the director of graduate studies, but an individual adviser or thesis director will be chosen as soon as practicable, following the department’s policies.

Advisors and thesis directors are normally chosen from the teaching and research faculty of the student’s department. There also may be one codirector chosen from the faculty outside (or within) the student’s department. In exceptional cases, a department may choose a thesis director from the Notre Dame teaching and research faculty outside the student’s department. Arrangements for extra-departmental directors or codirectors must be consistent with departmental policies and must be approved by the Graduate School.

Master’s Examination

By the end of the term following completion of the course work required by the department, the degree candidate must have taken an oral and/or written master’s examination demonstrating mastery in his or her field. Failure in either one or both parts of the examination results in automatic forfeiture of degree eligibility, unless the department recommends a retake. If a retake is recommended, it must be completed by the end of the following semester. The Graduate School allows only one retake of the master’s examination.

Some departments have an equivalent requirement in lieu of the master’s examination. Students are advised to be cognizant of their respective departmental requirements with regard to the master’s examination or its substitute.

A doctoral student may receive the master’s degree without taking the master’s examination on the recommendation of the department and completion of (a) the course work required by the department for the master’s degree and (b) all written parts of the doctoral candidacy or Ph.D. qualifying examination. Departments may have additional criteria or may choose not to offer a master’s degree in this manner; students should consult the departmental guidelines.

Admission to Candidacy

To qualify for admission to candidacy, a student must be in a master’s degree program. He or she must have been enrolled in the program without interruption and must maintain a minimum cumulative G.P.A. of 3.0 in approved course work. A student who seeks admission to candidacy in a research master’s program must also demonstrate research capability and receive departmental approval of his or her thesis proposal.

Admission to candidacy is a prerequisite to receiving any graduate degree. It is the student’s responsibility to apply for admission by submitting the appropriate form to the Graduate School office through the department chair. The applicable deadline is published in the Graduate School calendar.

Thesis Requirement

The thesis is the distinctive requirement of the research master’s program. With the approval of his or her adviser, the student proposes a thesis topic for departmental approval. The approved topic is researched and the results presented under the supervision of a thesis director.

The thesis director indicates final approval of the thesis and its readiness for the readers by signing the thesis. The candidate then delivers the number of signed copies of the completed thesis required by the department to the department chair. These copies are distributed to the two official readers appointed by the department. Readers are appointed from among the regular teaching and research faculty of the student’s department. The appointment of a reader from outside the student’s department must have the Graduate School’s prior approval. The thesis director may not be one of the official readers. Each reader must unconditionally approve the thesis and the department should promptly report the results to the Graduate School.

Submitting the Thesis

The format of the thesis should follow the guidelines published in the Graduate
Requirements for the Doctor of Philosophy Degree

The goal of the University in its Ph.D. programs is to develop productive scholarship and professional competence in its students. In addition to a broad acquaintance with the historical and contemporary state of learning, the University encourages its students and faculty to make contributions to the advancement of their respective fields.

In addition to the following Graduate School requirements, individual departments may require higher standards. Students are expected to know their departmental requirements.

Credit Hours
The number of semester credit hours of formal courses, directed studies, and research is specified by the student’s department. (See also, “Transfer Credits,” above.)

Residency
The minimum residency requirement for the Ph.D. degree is full-time status for four consecutive semesters (may include the summer session).

Foreign Language Requirement
This requirement varies from department to department, in both the choice of language and the degree of proficiency required. Students should consult their department concerning this requirement.

Award of Master’s Degree to Doctoral Students
A doctoral student may receive the master’s degree without taking the master’s examination on the recommendation of the department and completion of: (a) the course work required by the department for the master’s degree and (b) all written parts of the doctoral candidacy or Ph.D. qualifying examination. Departments may have additional criteria, or may choose not to offer a master’s degree in this manner; students should consult the departmental guidelines.

Degree Eligibility
The student must fulfill all doctoral requirements, including the dissertation and its defense, within eight years from the time of matriculation. Failure to complete any of the Graduate School or departmental requirements within the prescribed period results in forfeiture of degree eligibility.

Advisers and Dissertation Directors
Each student is assigned an adviser from the time of enrollment. This may initially be the director of graduate studies, but an individual adviser or dissertation director will be chosen as soon as practicable, following the department’s policies.

Advisers and dissertation directors are normally chosen from the teaching and research faculty of the student’s department. There also may be one codirector chosen from the faculty outside (or within) the student’s department. In exceptional cases, a department may choose a dissertation director from the Notre Dame teaching and research faculty outside the student’s department. Arrangements for extra-departmental directors or codirectors must be consistent with departmental policies and must be approved by the Graduate School.

Candidacy Examination
The candidacy examination consists of two parts: a written component and an oral component. The written part of the examination normally precedes the oral part. It is designed, scheduled, and administered by the department. The oral part of the examination is normally taken after the completion of the course work requirement, but no later than one calendar year prior to defense of the dissertation. The oral part, among other things, tests the student’s readiness for advanced research in the more specialized area(s) of his or her field. In total, the examination should be comprehensive. Successful passage indicates that, in the judgment of the faculty, the student has an adequate knowledge of the basic literature, problems, and methods of his or her field.

A board of at least four voting members nominated by the department and appointed by the Graduate School administers the oral part of the examination. Normally, this board has the same membership as the student’s dissertation committee. Board members are chosen from the teaching and research faculty of the student’s department. The Graduate School should be consulted before the department or the student invites a faculty member outside the student’s department to be a board member.

A faculty member appointed by the Graduate School from a department other than the candidate’s department chairs the examination board. This chair represents the Graduate School and does not vote. After completion of the examination, the chair calls for a discussion followed by a vote of the examiners. On a board of four, three votes are required to pass. If a department chooses to have five members, four votes are required to pass. The chair should, before the examination begins, ask the candidate’s adviser to confirm departmental regulations for conduct of the examination and voting procedures. The chair sends a written report of the overall quality of the oral examination and the results of the voting immediately to the Graduate School.

In case of failure in either or both parts of the doctoral candidacy examination, the department chair, on the recommendation of a majority of the examiners, may authorize a retake of the examination if this is permitted by departmental regulations. An authorization for retake must be
approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate’s permanent record.

Admission to Candidacy
Admission to candidacy is a prerequisite to receiving any graduate degree. To qualify for admission to doctoral candidacy, a student must:
1. be in a doctoral program;
2. have been continuously enrolled in the program without withdrawal;
3. complete the departmental course work requirement with a cumulative average of 3.0 or better;
4. pass the written and oral parts of the doctoral candidacy examination.

It is the responsibility of the student to apply for candidacy admission by submitting the appropriate form to the Graduate School office through the department chair. Consult the Graduate School calendar for the appropriate deadline.

The Dissertation
In continuing consultation with the dissertation director, the student explores research areas in his or her field to formulate a dissertation proposal. The methods of approval of the dissertation proposal are determined by the individual departments.

The department chair or director of graduate studies will appoint a dissertation committee consisting of the dissertation director and three readers. Normally, the committee is drawn from the membership of the student’s oral candidacy board. The Graduate School must be consulted before the department invites a committee member from outside the teaching and research faculty of the student’s department.

The candidate delivers typed copies of the finished dissertation, signed by the director, to the department chair for distribution to the three readers. Readers normally have two to four weeks to read the dissertation, decide whether it is ready to be defended, and so indicate on the appropriate form to the Graduate School. Reader approval of the dissertation for defense does not imply reader agreement or support; it implies reader acknowledgment that the dissertation is an academically sound and defensible scholarly product. Only a dissertation that has been unanimously approved for defense by the three readers may be defended.

Even though the dissertation has been approved for defense, revisions may be required. If defects in the dissertation come to light at the defense, the candidate may be asked to revise the dissertation before it is accepted by the Graduate School and the degree is conferred. In that case, it will be the responsibility of the dissertation director, or such person as the committee may appoint, to report to the Graduate School that such revisions have been completed satisfactorily.

Defense of the Dissertation
In defending the dissertation, the doctoral candidate supports its claims, procedures, and results. The defense is the traditional instrument that enables the candidate to explore with the dissertation committee the dissertation’s substantive and methodological force. In this way, the candidate and the committee confirm the candidate’s scholarly grasp of the chosen research area.

The format of the defense is determined by the department with the Graduate School’s approval. The defense is chaired by a faculty member who is appointed by the Graduate School from a department other than the candidate’s department. This chair represents the Graduate School and does not vote. After the examination is completed, the chair calls for a discussion followed by a vote of the dissertation committee. At least three votes out of four will be required to pass a candidate. The chair sends a written report of the overall quality of the defense and the voting results immediately to the Graduate School.

In case of failure of the defense, on the recommendation of a majority of the examiners, another opportunity to defend may be authorized if this is permitted by departmental regulations. An authorization for a second defense must be approved by the Graduate School. A second failure results in forfeiture of degree eligibility and is recorded on the candidate’s permanent record.

Submitting the Dissertation
To receive the degree at the next commencement, the doctoral student who has successfully defended his or her dissertation must submit it to the Graduate School on or before the deadline published in the Graduate School calendar. Students should be cognizant of deadlines for graduation established by the Graduate School and the department.

To be accepted by the Graduate School, the dissertation should be prepared according to the formatting guidelines published in the Graduate School’s Guide for Formatting and Submitting Dissertations and Theses, even if the candidate has previously published the substance of the dissertation in scholarly journals. The Guide is available at the Graduate School office and on the Graduate School Web site at www.nd.edu/~gradsch/currentstudent/DissGuide/DissGuide.html.

When the dissertation is given to the readers, the candidate should also give a complete copy to the Graduate School where it will be reviewed for compliance with the style manual. After successfully defending the dissertation and making any necessary changes, the candidate must then present two clean copies, signed by the dissertation director, to the Graduate School for final approval and submission. The candidate pays the binding costs for the two official copies required by the Graduate School and for any additional copies required by the department or for personal use. The Graduate Council requires that all doctoral dissertations be microfilmed by ProQuest Information and Learning (formerly Bell & Howell, UMI). Microfilming costs are also paid at the Graduate School office, which handles this publication requirement for the candidate.

One-of-a Kind (OAK) Ph.D. Program
It is possible at Notre Dame for an exceptional student to pursue a Ph.D. program with a particular faculty member in a department that does not offer the doctoral degree. Admission to such a program is rare and is reserved only for the most exceptional students.

The One-of-a Kind (OAK) Ph.D. is conferred in the field of study agreed to by the student, the mentor, the chair of the home department, the dean of the college, the dean of the Graduate School, and the final dissertation committee. The name given to the field of study may not overlap with a field already covered by an existing Ph.D. program at the University without approval from that department’s chair.

Program of Study
As with other Ph.D. programs, an OAK program includes course work, exam preparation culminating in a qualifying examination, and research culminating in a dissertation.
Courses within the home department usually include an additional directed studies component. An OAK student also gains experience as a teaching apprentice in at least one advanced undergraduate class or as an independent instructor.

Primary responsibility for advising rests with the designated faculty adviser, who is responsible for organizing a program of study and the appropriate examination and dissertation committees. The dissertation committee will include at least two members from Ph.D.-granting departments.

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**Admission**

Admission requires a master’s degree and is based on an evaluation of the following:

- undergraduate and graduate G.P.A.
- GRE scores
- letters of recommendation
- appropriate language skills
- a detailed statement of purpose
- a well-defined program of study
- compatibility of intentions with potential mentors and resources at Notre Dame
- compatibility of intentions with the research profile and academic record of the faculty mentor
- the likelihood of eventual placement in the field

Admission standards are exceptionally high, and a prospective OAK student must be approved, in turn, by the department chair in consultation with his/her colleagues; the college dean in consultation with a college OAK advisory committee; and the dean of the Graduate School in consultation with a Graduate School OAK advisory committee.

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**Academic Resources**

**University Libraries**

([www.nd.edu/~ndlibs](http://www.nd.edu/~ndlibs))

The University library system consists of 10 libraries, which house most of the books, journals, manuscripts, and other non-book library materials available on the campus. Currently, the collections contain nearly three million volumes, more than three million microform units, and over 18,180 audiovisual items to support the teaching and research programs. In the past year, the libraries added over 62,563 print volumes in addition to those in other formats and received about 23,000 serial titles.

Through the Notre Dame Web site and the NT/Windows network, users have immediate access to the University Libraries’ catalog, an array of electronic periodical indexes and full-text documents, and professionally developed subject guides to local and Internet-based resources. From their computers, users may request individualized reference assistance, place Interlibrary Loan requests, suggest titles for purchase, and recall or renew charged materials.

The Theodore M. Hesburgh Library, a 14-story structure, serves as the main library and its collections are of primary interest to the students and faculty of the College of Arts and Letters and the Mendoza College of Business. The tower also contains the University Archives, the Medieval Institute Library with the Frank M. Folsom Ambrosiana Microfilm and Photographic Collection and the Mary K. Davis Drawings Collection, and the Jacques Maritain Center.

Orientation sessions are presented by the library staff at the start of each semester and the summer session and are available to interested students and faculty.

A limited number of closed carrels are available to advanced graduate students upon application to their academic departments. Lokmobiles, a type of locker on wheels, also are available to graduate students upon application to the Circulation Desk.

The Business Information Center, located in the Mendoza College of Business complex, is an innovative, all-electronic facility supporting existing and emerging programs and research. This state-of-the-art facility is equipped with 30 individual workstations and two group learning areas with six workstations each, and provides access to and instruction and assistance in the use of a broad range of bibliographic, numerical, full-text, and graphic databases in business and related disciplines.

The remaining eight libraries were established to meet the teaching and research needs of the College of Engineering, the College of Science, the School of Architecture, and the Law School. These libraries generally contain the more recent literature and the Hesburgh Library retains the older materials.

The Architecture Library, located in Bond Hall, has a collection of over 24,358 volumes and over 110 currently received journals pertaining to various aspects of architecture.

The Chemistry/Physics Library, located in 231 Nieuwland Science Hall, maintains a collection of some 46,039 volumes and currently receives over 399 paper journals and 383 e-journals in all fields of chemistry and physics. It can provide database searches and bibliographic instruction.

The Engineering Library, located on the first floor of the Cushing Hall of Engineering, has a collection of 43,570 volumes and approximately 25,000 microform units and receives over 859 paper journals and about 500 e-journals related to engineering. The facility provides database searches as well as bibliographic instruction.

The Life Sciences Library, located on the first floor of the Paul V. Galvin Life Sciences Center, houses an estimated 27,000 volumes and receives approximately 602 journals in the field of biological sciences. It offers database searching and bibliographic instruction.

The Mathematics Library, located in 001 Hayes-Healey Center, has a collection estimated at 33,900 volumes and subscribes to over 267 paper journals and 145 e-journals, which deal with all areas of pure mathematics.

The Radiation Chemistry Reading Room, located in 105 Radiation Research Building, has a collection of approximately 4,800 volumes and receives 27 journals in radiation chemistry. It serves many of the information service needs of the radiation chemical community throughout the United States and abroad.

The Kellogg/KROC Information Center is located in 318 Hesburgh Center for International Studies and supports its work in international studies.

The Kresge Library, located in the Law School, is available for use by all students, faculty, and staff although it is not administratively a part of the regular library system. It has a collection of over 527,585 volumes of law and law-related materials.

The University, along with more than 208 major universities, colleges, and research libraries, maintains a membership in the Center for Research Libraries, which has access to over 3.5 million volumes of materials and 1.5 million microforms important to research. The University Libraries were elected to the Association of Research Libraries in 1962.
For further information about library facilities, call (219) 631-6258.

**Information Technologies**  
(www.nd.edu/~ndoit)

The Office of Information Technologies (OIT) supports 13 public-access computer clusters around the campus, plus one in the Hesburgh Library for the exclusive use of graduate students. These clusters provide access to almost 600 computers, running Macintosh, Windows, and UNIX operating systems, and high-quality printers for all students, faculty, and staff. Five clusters are usually open 24 hours every day. The OIT employs student consultants to help support these facilities. For more information about the Notre Dame computer clusters, go to www.nd.edu/~ndoit/clusters/hours.shtml.

The clusters, academic and most administrative buildings, and the residence halls are linked to a fiber-based campus network that provides access to a number of Notre Dame resources, as well as the Internet. Standard services include access to electronic mail and the World Wide Web. Notre Dame provides direct ethernet connections to the campus network to graduate students in Fischer and O’Hara-Grace graduate student residences. Ethernet connections are available in Hesburgh Library carrels by request and a cluster of networked computers is available in the married student housing community center. In addition to the locations listed above, all students have access to ResNet connections in LaFortune Student Center, DeBartolo Interactionary Area, and the second floor of the Hesburgh Library.

Many support services are provided by the OIT. Computers can be purchased in the OIT Solutions Center on the first floor of the Computing Center/Math Building. Students, faculty, and staff can purchase computers and printers at educational discounts. The Solutions Center also provides a variety of software at educational discount prices. CDs of Microsoft and Corel software are currently available to the Notre Dame community for a substantial savings through an annual license fee. See www.nd.edu/~solution for more information about the OIT Solutions Center.

The OIT Help Desk is located in Room 111 of the Computing Center/Math Building. The Help Desk provides answers to usage questions, diagnosis of problems, and problem resolution. The Help Desk is open Monday through Friday from 8:00 a.m. to 5:00 p.m. See www.nd.edu/~ndoit/helpdesk for more information about the Help Desk.

OIT Education Services offers computer-related, noncredit daytime courses to staff, faculty, and the students of the Notre Dame, Saint Mary’s, and Holy Cross communities. The classes cover a wide range of applications in both Windows and Macintosh, and are free of charge. For more information on these and other Education Services programs, see www.nd.edu/~ndoit/training.

The OIT maintains a High Performance Computing Cluster (HPCC) to provide a parallel computing environment for computationally intensive work and research. Some primary users of the HPCC include Chemistry, the Radiation Lab, Center for Applied Mathematics, Computer Science and Engineering, and the Theoretical Solid State Electrophysics Research Group. The University community also has access to national supercomputing and data resource facilities.

OIT’s Knowledge Management division provides ad hoc reporting services to the campus. These reports may be against internal or external data as long as the user has obtained permission to access the data. Knowledge Management also builds data and document repositories for easier self-service access by end users across the campus. Our Information Engineer also provides logical data modeling services for database projects. If interested, please contact Patrick Miller, Director, (219) 631–6909. The Media Resource Library in DeBartolo Hall is a library service of Knowledge Management, which includes many video and other multimedia items for use in classes. The Media library also assists in locating and ordering new titles. The Media Resource Library is located on the first floor of DeBartolo Hall in Room 115. Please contact Roberta McMahon at (219) 631–5515.

DeBartolo Hall, the University’s high-technology classroom building, has 42 permanent computers on podia for class presentations. Two classrooms have a computer on each student desk for collaborative work. Media-On-Call, a fiber-optic video delivery system, provides media to all classrooms in DeBartolo and the Mendoza College of Business complex. In addition to the shared facilities of the OIT, specific colleges have their own facilities.

Anyone using Notre Dame computers and networking resources is responsible for observing the policies set forth in the document G0001 Responsible Use of Information Technologies at Notre Dame. The full text of this policy is available from the Help Desk or online at the Web page: www.nd.edu/~doc/G0001.html.

For more information about the many services the OIT offers the Notre Dame community, go to www.nd.edu/~ndoit.

**The Suite Museum of Art**  
(www.nd.edu/~sniteart)

The Museum features collections that place it among the finest university art museums in the nation.

The Mesoamerican collection highlight is the comprehensive, exceptional holdings of Olmec works, the earliest Mexican civilization.

The Kress Study Collection has been the foundation for developing Italian Renaissance art, which includes a rare Ghirlandaio altarpiece panel. The Baroque collection highlights works by Bloemaert, Couypel, and van Ruisdael. Selections from the Feddersen Collection of 70, notable Rembrandt van Rijn etchings are exhibited frequently; and, the 18th-century collection includes such masters as Boucher, Vigée-Lebrun, Reynolds, Conca, and de Mura.

The critically acclaimed John D. Reilly Collection of Old Master to 19th-century drawings includes examples by Tintoretto, Tiepolo, Oudry, Fragonard, Ingres, Géricault, Millet, and Degas. The Noah and Muriel Butkin Collection of 19th-Century French Art is the foundation of one of the Museum’s major strengths, featuring paintings and drawings by Corot, Boudin, Couture, Courbet, and Gérôme.

The Decorative and Design Arts Gallery spans the 18th through 20th centuries and exhibits early porcelains from Sèvres 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, Tiffany, and Hoffman are also on view.

The Janos Scholz Collection of 19th-Century European Photography contains...
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 developing American 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, Russell, and Remington.

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, Calder, 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 that remain on campus. Major pieces can be seen in the Museum, at the Eck Visitor Center, and the Basilica of the Sacred Heart.

Loan exhibitions from major museums and private collections, in addition to exhibitions mounted by the Snite, are offered periodically in the O’Shaughnessy Galleries, as is the annual exhibition of student art by candidates for M.F.A. and B.F.A. degrees.

Special events and programs include lectures, recitals, films, and symposia held in the 304-seat Annenberg Auditorium and in the galleries.

Interdisciplinary and Specialized Research Institutes

In pursuance of its public service commitment, the University, assisted by various private foundations and federal agencies, maintains several interdisciplinary and specialized research institutes.

The University institutes include:
- Kellogg Institute for International Studies
- Kroc Institute for International Peace Studies
- Medieval Institute
- Radiation Laboratory
- Other institutes, centers and similar entities include:
  - Alliance for Catholic Education
  - Center for Advanced Food Processing
  - Center for Applied Mathematics
  - Center for Asian Studies
  - Center for Astrophysics
  - Center for Catalysis and Reaction Engineering
  - Center for Civil and Human Rights
  - Center for Continuing Education
  - Center for Environmental Science and Technology
  - Center for Ethics and Culture
  - Center for Ethics and Religious Values in Business
  - Center for Molecularly Engineered Materials
  - Center for Nano Science and Technology
  - Center for Philosophy of Religion
  - Center for Research in Banking
  - Center for Tropical Disease Research and Training
  - Center for U.S.-Japanese Business Studies
  - Center for Zebradish Research
  - Cushwa Center for the Study of American Catholicism
  - Ecumenical Institute (Jerusalem)
  - Engineering Learning Center
  - Environmental Research Center (UNDERC)
  - Erasmus Institute
  - Fanning Center for Business Communication
  - Freimann Life Science Center
  - Gigot Center for Entrepreneurial Studies
  - Hessert Center for Aerospace Research
  - Higgins Labor Research Center
  - Industrial Assessment Center
  - Institute for Church Life, embracing
    - Center for Pastoral Liturgy
    - Center for Social Concerns
    - Retreats International
  - Institute for Educational Initiatives
  - Institute for Latino Studies
  - Institute for Scholarship in the Liberal Arts
  - Kaneb Center for Teaching and Learning
  - Keck Center for Transgene Research
  - Keough Institute for Irish Studies
  - Laboratory for Social Research
  - Lazzaro Magnetic Resonance Research Center
  - Lobund Laboratory
  - Maritain Center
  - Marital Therapy and Research Clinic
  - Mendelson Center for Sports, Character, and Culture
  - Nanovic Institute for European Studies
  - Philosophic Institute
  - Reilly Center for Science, Technology and Values
  - South Bend Center for Medical Education
  - Walther Cancer Research Center
  - White Center for Law and Government

Those centers with particular relevance for graduate education are described in the “Centers, Institutes, and Laboratories” section of this Bulletin.

Research Opportunities and Support

University policies on research and other sponsored programs are maintained on the Web site of the Office of Research at www.nd.edu/~research/Pol_Proc/toc.html.

Oak Ridge Associated Universities

Since 1992, students and faculty of the University of Notre Dame have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 85 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minor students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at http://www.orau.gov/orise/resgd.htm, or by calling either of the contacts below.

ORAU’s Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU’s members, private industry, and major federal facilities. Activities include faculty development
programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, and support programs, as well as services to chief research officers.

For more information about ORAU and its programs, contact Anthony K. Hyder, associate vice president for Graduate Studies and Research at Notre Dame and ORAU council member at (219) 631–8591, or Monnie E. Champion, ORAU corporate secretary, at (865) 576–3306; or visit the ORAU home page (http://www.orau.org).

Institute for Scholarship in the Liberal Arts

The goal of the Institute for Scholarship in the Liberal Arts (ISLA) is to help build, sustain, and renew a distinguished faculty in the arts, humanities, and social sciences, and to enhance the intellectual life on campus. ISLA does this in several ways.

Internal Grants: ISLA provides grants for faculty research, travel to international conferences, curriculum development, honoraria for visiting scholars (through the Henkels Lecture Series), publication subvention, and miscellaneous research expenses.

External Grant Support: The institute is the college’s clearinghouse for information, advice and assistance in finding and obtaining grant funds for any academic purpose. Institute staff assist faculty in several ways: advising faculty regarding the content of grant proposals; assisting in the preparation of proposal budgets; critiquing draft proposals; and ushering proposals through the administrative review process. In support of this effort, ISLA maintains a grant reference library that includes computerized grant search databases, and hosts several grant proposal workshops during the year.

Special Programs: The institute offers a variety of other faculty development activities, such as workshops on academic writing and publishing with an academic press. ISLA also coordinates various student scholarship and fellowship programs.

Inter-University Visitation Program

The Midwest Catholic Graduate Schools (MCGS) is a consortium of the Catholic universities of the Midwest that have significant doctoral programs. In addition to Notre Dame, the members are Loyola University of Chicago, Marquette University, and Saint Louis University.

A degree-seeking graduate student at an MCGS university, after initiating a program of studies at the “home university,” may with appropriate approvals take course work or pursue research at one of the other three institutions (“host universities”) as a visiting student. Procedures have been introduced to facilitate such visits. The student registers at both the home and the host universities. Tuition is assessed at the home university at its rate. Registration entries and final grades are forwarded from the host to the home university for listing on the student’s permanent record.

Inter-university visitation makes it possible for students to take advantage of courses or research opportunities offered by the other three institutions that might not be readily available at the home university. Thus, the program expands the choices available to MCGS students for shaping a degree program.

Interested students should review the graduate bulletins and class schedules of the host universities and consult with their advisers and major-field directors.

To participate, a student must complete an “Application for Inter-university Visitation” and secure the necessary approvals from the home institution. Then the graduate dean of the host university must approve the visitation. Finally, an “Intra-MCGS Enrollment Form” must be completed for each course to be taken at the host institution.

Participation is restricted to those fields of study that are under the academic jurisdiction of the graduate deans at both the home and the host institutions. A degree-seeking student must first have completed at least the equivalent of one full semester at the home university. No more than nine credit semester hours of courses from host institutions can form part of a degree program at the home institution. Interested students may obtain further information and application forms from the Graduate School, 502 Main Building. Nondegree or transient students at the home institution may not participate in inter-university visitation.

Graduate Student Awards

The Eli and Helen Shaheen Graduate School Award recognizes the top graduating Ph.D. recipients in engineering, the humanities, science, and social sciences. Nominated by their departments, the four Shaheen Award winners are chosen for their superior ability as exhibited by grades, research and publication records, fellowships, and other awards received during the course of study at Notre Dame, and teaching ability. Each year, the winners’ names are added to a permanent Shaheen Award plaque displayed in the Graduate School, and they also receive a personal plaque and a cash award.

Graduate Student Government

Through a council of elected officers, appointed officers, and representatives from the departments of its constituent colleges, the Graduate Student Union (GSU) provides a variety of services and represents its membership on various University councils and committees. In particular, it subsidizes graduate student travel to present original research, publishes the quarterly GSU newsletter, provides biweekly listserv updates, conducts a graduate orientation program, and sponsors teaching and professionalism workshops, in addition to providing various social, cultural, and intellectual activities. The GSU is the graduate students’ official liaison with the University administration and the Office of Student Activities.

The Graduate Student Union finances its operations and Conference Presentation Grant (formerly known as the Robert Gordon Travel Grant) through a yearly, mandatory activity fee assessed on all graduate students through the Office of Student Accounts. The Graduate Student Union maintains offices in the LaFortune Student Center at the Mezzanine location (219) 631–6963. Send any e-mail inquiries to dfrahn@nd.edu.

Graduate Student Career Services

(www.nd.edu/~ndcps)

The increasingly diverse needs of a dynamic labor market have resulted in new challenges for graduate students. Traditional academic options are no longer as plentiful, and the competition for openings is intense. These developments warrant a more comprehensive approach to identifying and pursuing faculty appointments. They also challenge graduate students to investigate
academic opportunities beyond the scope of traditional colleges and universities. Fortunately, while the academic marketplace tightens, alternative careers in business and industry are beginning to evolve. Emerging technologies and processes are resulting in new initiatives in the corporate sector, particularly in the areas of research and development, marketing, human resources, and management.

These same dynamics have supported the trend toward alignments between corporate research interests and graduate student employment, especially in the fields of science and engineering. It is increasingly important that proactive steps be taken to cultivate internships, sponsored research initiatives, and other opportunities that will enhance the prospects for graduate students in these disciplines.

The Office of Graduate Student Career Services (GSCS) was established in order to monitor these and other rapidly changing dimensions of the employment market and to promote the career interests of our graduate students. Individuals who wish to be proactive in seeking employment assistance with various aspects of the search may contact the GSCS.

The GSCS offers programs in marriage preparation and family life, retreats, faith sharing, sacramental preparation, and pastoral counseling. It coordinates liturgies in the Basilica of the Sacred Heart and in the residence hall chapels. Graduate students are welcome to participate in these celebrations and to serve as Eucharistic ministers, lectors, or members of the Notre Dame liturgical choirs and music groups. Campus Ministry prepares a listing of all Catholic Masses offered each week at the Basilica of the Sacred Heart and in the residence halls. In addition to this, lists of local Protestant churches, as well as synagogues and mosques, are mailed to all graduate students at the beginning of the academic year with times of services and telephone numbers to call for transportation.

Campus Ministry offices are located at 103 Hesburgh Library Concourse ([219] 631–7800) and in the Coleman-Morse Center.

Other Facilities and Services

Campus Ministry
(www.nd.edu/~ministry)
Notre Dame is a Catholic institution, which extends a welcome and our desire to be of service to students of all denominations and faith traditions.

Through the programs offered by Campus Ministry, we hope to provide the opportunities for students to deepen their faith, to develop a spirituality that will serve them well as adult believers, and to discuss the religious and ethical aspects of questions that are essential for all of us.

Pastoral needs of graduate students are met in a variety of ways. Liturgies, prayer services, retreats, and spiritual counseling are available through personnel at University Village and at the Fischer-O’Hara-Grace Graduate Residences as well as through the offices of Campus Ministry. There is a chapel at Fischer Graduate Residences for the use of graduate students with daily and Sunday Masses and opportunities for sacramental reconciliation.

Campus Ministry offers programs in marriage preparation and family life, retreats, faith sharing, sacramental preparation, and pastoral counseling. It coordinates liturgies in the Basilica of the Sacred Heart and in the residence hall chapels. Graduate students are welcome to participate in these celebrations and to serve as Eucharistic ministers, lectors, or members of the Notre Dame liturgical choirs and music groups. Campus Ministry prepares a listing of all Catholic Masses offered each week at the Basilica of the Sacred Heart and in the residence halls. In addition to this, lists of local Protestant churches, as well as synagogues and mosques, are mailed to all graduate students at the beginning of the academic year with times of services and telephone numbers to call for transportation.

Campus Ministry offices are located at 103 Hesburgh Library Concourse ([219] 631–7800) and in the Coleman-Morse Center.

Campus Security—Safety Information from Notre Dame Security/Police
(www.nd.edu/~ndspd)
The security of all members of the campus community is of paramount concern to the University of Notre Dame. Each year the University publishes an annual report outlining safety and security 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, 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 SafeWalk program, and the campus shuttle service. You may view the document on the Web at www.nd.edu/~ndspd/safebroc.html. A printed copy of this brochure is available by sending an e-mail request to ndspd.1@nd.edu or by writing to: Office of the Director, University Security/Police, 101 Campus Security Building, Notre Dame, IN 46556 or by calling the department at (219) 631–8338.

A variety of safety and security information is available from the security/police Web site: www.nd.edu/~ndspd.

Parking
(www.nd.edu/~ndspd/parking.html)
Information about traffic and parking regulations and vehicle registration is available from the Parking Service office, 117 Campus Security Building or by calling (219) 631–5053. Students must register vehicles operated or parked on campus.

Counseling Services
(www.nd.edu/~ucc)
The University Counseling Center, located on the third floor of the University Health Center, offers professional services to all graduate students. The center is devoted to meeting the students’ needs and assisting them with their problems and concerns. These concerns might include personal growth and self-enhancement, vocational issues and academic anxieties, interpersonal relationships and social difficulties, depression, substance abuse and addiction, and a number of more severe emotional and psychological problems.

The center is staffed by licensed clinical psychologists, counseling psychologists, an addiction specialist, doctoral interns, and students who are supervised by professional psychologists, a consulting psychiatrist, and a consulting nutritionist. The center operates under an ethical code of strict confidentiality.

Professional services are usually by appointment and can be arranged either in person or by telephone, but provision is always made for an emergency. Services are offered at a minimal fee of $4 per session. There is no charge for the initial appointment.

For information or an appointment, contact the Counseling Center, (219) 631–7336. Twenty-four hour emergency service is available by calling (219) 631–7336. Further information about the Counseling Center can also be found on the World Wide Web.

Health Services
(www.nd.edu/~uhs/uhs.html)
The University Health Center provides comprehensive treatment of illness and injuries to all students enrolled at the University. The services provided include an ambulatory clinic, pharmacy, laboratory, X-ray facilities, and an inpatient unit.

There is no fee to see the University physicians or nurses. Students must pay for prescriptions, over-the-counter medications,
supplies, and specially prescribed treatments/procedures. A statement of the charges for services rendered will be mailed to students, enabling them to file for personal insurance reimbursement. Most charges are covered under the University-sponsored student insurance plan, and the Health Center clerical staff files those claims.

The ambulatory clinic services are available on a walk-in or scheduled basis. Allergy shots must be scheduled. Emergencies are seen immediately. Referrals are made to local physicians and dentists for consultation and treatment of special cases.

Inpatient beds are available for students when prescribed by a University physician. Registered nurses provide 24-hour-per-day care. There are no inpatient room and board fees for on-campus students. Off-campus students pay a nominal inpatient room and board fee. All inpatient students pay for their laboratory tests, medications, and treatments.

Laboratory services are provided on site through a satellite facility of the South Bend Medical Foundation, a large local laboratory that also serves the local hospitals.

In case of emergency, the University Security Department provides for transportation of students to local hospitals. Local ambulance services are readily available. Transportation to local physicians’ offices for care that is not an emergency is provided by Health Services if a University physician has referred the patient. Hours of transportation are limited to 12:15 p.m. to 5 p.m., Monday through Friday, during the academic year when the University is in session.

All student health records are kept confidential. No information is released to anyone, including parents and University authorities, without the student’s prior permission. In the event of emergency requiring hospitalization, where it is impossible to obtain a student’s permission, a University physician or the hospital will notify a parent or legal guardian.

Further information may be obtained from the University Health Center, (219) 631–7497/7567.

**Library and Athletic Facilities**

In addition to the cost of instruction, tuition charges cover the use of the library and athletic facilities other than the golf course and the ice rink, on which a nominal fee is assessed.

**Multicultural Student Programs and Services**

*Telephone: (219) 631–6841*

*E-mail: nd.msps.1@nd.edu*

(www.nd.edu/~msps)

The Multicultural Student Programs and Services office encourages and supports traditionally underrepresented students in using all academic and leadership opportunities at the University. The office focuses on student leadership development skills, provides networks for internships and summer research positions, and offers diversity and multicultural educational programming for the entire campus. While working with 17 ethnic organizations, Multicultural Student Programs and Services collaborates with other academic and Student Affairs departments, Student Union Board, and Student Government to ensure representation of the total student body in programming efforts.

In conjunction with Student Affairs, the office sponsors an annual fine arts/lecture series, which addresses various issues impacting people of color. This series serves as a medium to begin dialogue on commonalties, differences, and interest. Another initiative, MSPS-Building Bridges Program, provides first-year students with mentors who are faculty, administrators, upper-class MOPS scholars, and upperclassmen. The participants are exposed to career and graduate school initiatives, scholarships, and University awards. Another major programming effort is the First Friday lunch program held to permit faculty, administrators, and undergraduate and graduate students an opportunity to interact in an informal atmosphere. For further information, contact the office in the Intercultural Center, 210 LaFortune Student Center.

**International Student Services and Activities**

(www.nd.edu/~issa)

The University of Notre Dame’s international student body is made up of nearly 800 students from 100 countries. The campus community benefits from this diversity through opportunities to learn about other cultures, the sharing of experiences, the promotion of intercultural understanding, and the chance to practice other languages.

Many of the services and programs that enhance international educational exchange are offered through International Student Services & Activities (ISSA). This office strives to create a supportive atmosphere where students can live and learn effectively. The office also promotes international programs as a means of stimulating cross-cultural understanding and interest within the campus and community.

Services and programs offered include the International Orientation Program, Family Friendship Program, International Resource Bureau, annual International Week, international club advising, community outreach, general advising, counseling, and referral.

Since many international graduate students bring their families with them to Notre Dame, ISSA tries to meet their needs as well. For example, English As A Second Language classes are offered to spouses of international students, and an International Women’s Club offers support and activities to the wives of international students throughout the year.

International Student Services & Activities is located in Room 204A, LaFortune Student Center. A separate office, International Relations and Student Visas, is located at 201B Security Building and provides immigration advice to international students.

**Office for Students with Disabilities**

The Office for Students with Disabilities (OSD) provides a variety of services to ensure that qualified students with disabilities have access to the programs and facilities of the University. Services do not lower course standards or alter essential degree requirements, but instead give students the opportunity to demonstrate their academic abilities. Students can initiate a request for services by registering with the OSD and providing information that documents their disability.

While the services or accommodations provided depend on the student’s disability and their course or program, some of the services that have been used include extended time on exams and/or separate testing rooms; textbooks on cassette tape, large print, in Braille, or on computer disk; readers, note takers, and academic aides; screening and referral for diagnostic testing for a learning disability or attention deficit
disorder; housing modifications; and hearing amplification equipment. OSD also has a room in the library with CCTV, Arkenstone Reader, and Braille printer for student use.

For more information on services or to receive a copy of the University of Notre Dame Policies and Procedures for Students and Applicants with Disabilities, please contact: Coordinator, Office for Students with Disabilities, 109 Badin Hall, (219) 631–7141 (voice), (219) 631–7173 (TTY).

**Policies on Harassment and Other Aspects of Student Life**

Sexual and discriminatory harassment and harassment in general are prohibited by the University. Definitions and policies regarding all forms of harassment and other aspects of student life and behavior are described in *duLac: A Guide to Student Life*, which is the University’s description of student life policies and procedures. The codes, rules, regulations, and policies that establish the official parameters for student life at Notre Dame are contained in *duLac*. Unless otherwise noted, the policies and procedures in *duLac* apply to all students, undergraduate, graduate, or professional, whether the behavior occurs on or off campus. Copies of *duLac* are provided to all students at the time of their enrollment and may also be obtained from the Office of Residence Life and Housing, located in the Main Building.

**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.*

**Tuition and Expenses**

Please note: The following tuition fees, housing and living costs are for the academic year 2001–2002. Prospective applicants and students are urged to find out the exact costs at the time of application or registration.

**Tuition**

For the full-time graduate student, the tuition for the academic year 2001–2002 is $24,220. Tuition for the part-time student is $1,346 per semester credit hour.

In the academic year, the normal charge for an audited course is one half the current credit hour fee. However, a full-time graduate student may audit a course, or courses, without charge. The Graduate School determines the definition of full time.

In the summer session, there is no free audited course. Any course taken or audited in the summer session will be charged the full price.

**Fees**

Nonrefundable application fee: $50 ($35 if submitted by December 1 for admission to the following fall semester)

* Technology Fee: $100

Graduate Student Activity Fee: $55

* The technology fee provides partial funding for the University’s enterprise-wide technology infrastructure. Through this infrastructure, all students are given access to the Internet, e-mail, courseware, institutional file space, and a wide array of software. The infrastructure also provides access to these products and services through various means, including campus clusters and ResNet, and from remote locations through direct dial-in. The $100 fee will be assessed at $50 per semester.

NOTE: The University no longer charges for copies of transcripts of record.

**Financial Arrangements**

Tuition and fees, as well as any required deposits, are payable in advance at the beginning of each semester. Please note that Notre Dame does not accept credit cards for payment of tuition and fees. Tuition and/or fees not covered by scholarship are the responsibility of the student.

A student may not register for a new semester or receive transcripts, certificates, diploma, or any information regarding his or her academic record until all prior accounts have been settled in full.
Withdrawal Regulation
Any graduate, law, MBA, * or undergradu-
ate student who at any time within the
school year wishes to withdraw from the
University should contact the Office of the
Registrar. To avoid failure in all classes for
the semester and in order to receive any
financial adjustment, the withdrawing
student must obtain the appropriate
clearance from the dean of his or her college
and from the assistant vice president for
residence life.

On the first day of classes, a full tuition
credit will be made. Following the first day
of classes, the tuition fee is subject to a
prorated adjustment/credit if the student:
(1) withdraws voluntarily for any reason on
or before the last day for course discontinu-
ance at the University; or (2) is suspended,
dismissed, or involuntarily withdrawn by
the University, for any reason, on or before
the last day for course discontinuance at the
University; or (3) is later obliged to
withdraw because of protracted illness; or
(4) withdraws involuntarily at any time
because of military service, provided no
credit is received for the classes from which
the student is forced to withdraw.

Upon return of the student forced to
withdraw for military service, the University
will allow him or her credit for that portion
of tuition charged for the semester in which
he or she withdrew and did not receive
academic credit.

Room and board charges will be adjusted/credited on a prorated basis throughout the
entire semester.

Students receiving University and/or
Federal Title IV financial assistance who
withdraw 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 withdraw date. Such funds
shall be returned promptly to the entity that
issued them, on a pro rata basis, and will be
reflected on the student’s University account.

This withdrawal regulation may change
subject to federal regulations. Examples of
the application of the tuition credit
calculation are available from the Office of
Student Accounts upon request.

* Executive MBA students are subject to a
different Withdrawal Regulation and Tuition
Credit Calculation, both of which may be
obtained from the Executive MBA Program.

Housing and Meals
University housing for both married and
single students is available on or adjacent to
the campus.

Accommodations for married students are
available in University Village, a complex of
107 two-bedroom apartments renting for
$326 per month. The Cripe Street Apart-
ments, 24 one-bedroom units, are available
from $423 to $446 per month. A $300
deposit is required. Address inquiries
about University Village to the Office of
Student Residences, 305 Main Building,
Notre Dame IN 46556, or phone
(219) 631–5878.

Accommodations for approximately 150
full-time, degree-seeking single graduate
men and women are available in the 36-unit
O’Hara-Grace Graduate Residence adjacent
to the campus. Each apartment has kitchen,
one-and-one-half baths, living, and bed-
room accommodations for four students.

Many general and departmental activities
are held in Wilson Commons, a center for
graduate students located next to the
townhouses. The student must take out an
individual nine-month lease for $2,489 plus
$608 for utilities. The Fischer Graduate
Housing apartment complex offers two-
bedroom apartments for single students.
The student must take out an individual
nine-month lease for $3,210 plus $526 for
utilities. A deposit of $300 is required for
either of these graduate-housing options.

Housing charges are due and payable by the
semester; however, payroll deductions may
be set up for any student receiving a
stipend. This is handled at the Office of
Student Accounts, 100 Main Building,
(219) 631–7113. Address inquiries about
University housing facilities to the Office of
Residence Life and Housing, 305 Main
Building.

Rates for off-campus apartments and houses
range from $300 to $1,500 per month.
Listings of available off-campus accommo-
dations may be obtained directly from the
Off-Campus Housing Office, 305 Main
Building, (219) 631–5583.

Food Services
(www.nd.edu/~ndfood)
All graduate students, whether they live on
campus or off campus, may purchase meal
plans for the University dining halls. A
variety of options is available in 2001–2002
ranging from $200 per semester to $1,785
per semester. Information on the variety of
options may be obtained directly from the
Card Services Office at the South Dining
Hall, (219) 631–7814.

Accident and Sickness Insurance
Notre Dame requires all international and
degree-seeking graduate students to have
health insurance coverage.

At the beginning of each academic year, the
opportunity is provided to show proof of
personal health insurance coverage. In the
event such proof is not presented, the
student will be automatically enrolled in the
University-sponsored plan, and the charge
for the premium will be placed on the
student’s account. The last date a graduate
or international student may be waived
from the University Student Insurance Plan
is September 15, 2001.

Information regarding the University-
sponsored plan is mailed to the student’s
home address in July. Additional informa-
tion is available in University Health
Services by contacting the Office of
Insurance and Accounts at (219) 631–6114.

The cost of the premium for the 2001–
2002 academic year (effective August 15,
2001, to August 15, 2002) is (depending on
the plan):

Option 1
Single $ 588.00
Spouse $2,667.00
One Child $1,032.00
All Children $1,909.00
Family $4,058.00

Option 2
Spouse $1,545.00
One Child $850.00
Family $2,108.00

The Office of Student Accounts will offer
students receiving a stipend from the
University the option of paying the
premium through deductions from the
academic year salary checks.

Child Care
An on-campus child-care center for the
children of faculty, staff, and students was
opened at Notre Dame in 1994. The Early
Childhood Development Center (ECDC)
provides a play-oriented learning curricu-

lum that fosters a child’s understanding of
self, others, the world, and problem solving. Literature, creative dramatics, music, play, and art are integrated into the daily schedule. The six-classroom center is staffed by 20 full-time employees, including six lead teachers who hold at least a bachelor’s degree. Notre Dame and Saint Mary’s College students serve as part-time teacher-assistants.

The program serves children ages two to six during the school year and two to nine in the summer. A number of full- and part-time schedules are offered to meet varying family needs, and the weekly cost of the program is tied to family income. ECDC also has operated a child-care program at nearby Saint Mary’s for 28 years.

For more information or to get on the waiting list, call (219) 631–3344.

Financial Support

Exact amounts for the following aid will vary with the type of support and the department. Exact figures can be obtained from the particular department. Initiation and continuation of financial support depends on the student’s maintaining good academic standing. Initiation and continuation of the following support programs require no specific application to either the department or the Graduate School.

Application

First-time applicants who indicate a need for financial support on the application for admission will be considered by the departmental admissions committee.

To ensure consideration for support, a first-time applicant must submit a completed application, including letters of recommendation, transcripts, and Graduate Record Examination (verbal, quantitative, and analytical) score and Subject Test score (if the department requires it), by February 1 preceding the fall for which the applicant seeks admission. Any international applicant must also submit a score from the Test of English as a Foreign Language (TOEFL).

Only full-time, degree-seeking students in residence at the University are eligible for support. Recipients of financial support such as assistantships or fellowships usually may not accept additional appointments. Rare exceptions are made only on the recommendation of the respective department.

In accordance with a resolution passed by the Council of Graduate Schools in the United States, the following policy is in effect:

By accepting an offer of financial aid (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year, the enrolled or prospective graduate student completes an agreement that both the student and graduate school expect to honor. When a student accepts an offer before April 15 and subsequently desires to withdraw, the student may submit a written resignation for the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made. Similarly, an offer made by an institution after April 15 is conditional on presentation by the student of a written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to this resolution that a copy of the resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

Categories of Support

The University offers three types of support: fellowships, assistantships, and tuition scholarships. Students may receive one type of support or a combination of types.

Fellowships

Fellowships provide a tuition scholarship and a stipend for full-time study by students admitted to doctoral programs. Applicants for admission are automatically considered by their academic department for all of the following University, endowed, and contributed fellowships. The department provides tuition and stipend support for the student in good standing once the fellowship expires.

University Fellowships

Presidental Fellowships are 12-month, four-year fellowships awarded by the Graduate School to highly qualified first-time applicants, who may be nominated for the awards by departmental admissions committees. Teaching assistance may be required in the second and third years of the fellowship.

The Clare Boothe Luce Fellowships for women and the Arthur J. Schmitt Presidential Fellowships are four-year fellowships awarded to graduate students entering a program in science or engineering. Luce and Schmitt Fellowships require U.S. citizenship.

First and Dissertation Year Fellowships.

Several departments offer one-year fellowships for full-time graduate studies and research toward the doctoral degree.

In addition to the prize fellowships named above, talented students from underrepresented groups, including African Americans, Asian Americans, Hispanics, and Native Americans, also may be nominated for a variety of two-year fellowships, among them the Coca Cola Company, McGuire, Liberal Arts, and University Endowed Fellowships. U.S. citizenship is required. For the McGuire Fellowships, provided by the contributions of Mr. and Mrs. Thomas M. McGuire, special consideration is given to African American students studying for a master’s degree. Highly qualified African American, Asian American, Native American, and Hispanic students accepted to any program in the humanities or social sciences are eligible for University Endowed Fellowships.

Contributed and Endowed Fellowships

Several fellowships funded by private contributions and income from endowments are awarded annually by individual academic departments.

Abrams Fellowship. This fellowship was begun in 1994 to fund a graduate student in the humanities or social sciences.

The Michael J. Birck Fellowship in Electrical Engineering. Established in 1982 by Michael J. Birck of Lisle, Illinois, the income from this fund provides assistance to graduate students in the field of telecommunications.

The Bond-Montedonico Graduate Fellowships in Architecture. The earnings from this fund, begun in 1985, are available for assistance to graduate students in architecture.

The Wendell F. Bueche Fellowships support graduate students in engineering.

The Joseph Z. Burgee and Joseph Z. Burgee Jr. Memorial Fellowship. Initiated by John H. Burgee in 1984, this fellowship provides a stipend for an exceptional graduate student in the master’s program in the School of Architecture.

The Joseph and Virginia Corasaniti Fellowship. This fellowship was begun in 1988 by Mr. Martin G. Knott and provides a stipend to a graduate student in architecture. Special consideration is given to female applicants of Italian descent.

The Donald K. Dorini Fellowships provide 12-month stipends to graduate students in
mechanical engineering who are studying hydronics.

The Fitzpatrick Fellowship. Endowed by Edward B. Fitzpatrick in 1987, this fellowship supports the studies of a graduate student in engineering.

The Raymond Jones Fellowship supports graduate students in philosophy.

The Walter W. and Margaret C. Jones Fellowship supports students in engineering.

The Roy and Joan Laughlin Fellowship is unrestricted in its support of graduate students at Notre Dame since 1989.

The Rev. J. David Max Memorial Fund, since 1978, has supported clerics who are studying liturgy in the Department of Theology.

The McCloskey Fellowships, endowed by Thomas D. McCloskey, fund two graduate students in the Joan B. Kroc Institute for International Peace Studies.

The Bayer Predoctoral and Postdoctoral International Peace Studies offers financial aid and paid summer internships to assist minority students in obtaining a master's degree.

The Bayer Predoctoral and Postdoctoral International Peace Studies located at the University of Notre Dame, supports minority students who study international relations.

The Albert Zahm Research Travel Fund. Awards from the fund will subsidize, in part, travel expenses incurred by graduate students for purposes directly related to their research. First priority will be accorded doctoral students who have been admitted to candidacy and whose research is the basis for their dissertation. Research master's degree students who have completed all requirements except the thesis will receive second priority.

The University is an active institutional member of the following fellowship programs:

Fellowship Consortia

The University is an active institutional member of the following fellowship programs:

Dorothy Danforth Compton Fellowships support minority students who study international relations.

National Consortium for Graduate Degrees for Minorities in Engineering and Science (GEM), the central office of which is located at the University of Notre Dame, offers financial aid and paid summer internships to assist minority students in obtaining a master's degree in engineering.

The Latin American Scholarship Program of American Universities (LASPAU) offers fellowships for U.S. graduate study to promising Latin American and Caribbean students and faculty.

Non-University Fellowships

Graduate students have been quite successful in earning National Science Foundation, Mellon, Compton, Fulbright, and other highly competitive extramural awards. An online, searchable database is available to access many graduate and postdoctoral fellowships and grants.

Fellowship programs in the departments of biological sciences and psychology are supported by the National Institutes of Health; in the Center for Environmental Science and Technology by the Department of Education; and in the departments of biological sciences and civil engineering and geological sciences by the National Science Foundation.

Department of Chemistry and Biochemistry.

The University offers full or partial tuition scholarships to eligible graduate students in all doctoral programs.

Research assistantships provide support to qualified students in all doctoral programs.

Tuition Scholarships

The University offers full or partial tuition scholarships to students qualifying on the basis of merit.

International Tuition Scholarships

Established by the University in 1985, these tuition scholarships are available to eligible international students for graduate study.

The Army ROTC Two-year Program Graduate students who have two years of education remaining may apply for the two-year contract program in the Army ROTC program. Graduate students are also eligible for scholarship benefits in some cases.

Administered by the Department of Military Science of the University of Notre Dame, this program requires successful completion of the two-year undergraduate ROTC basic course or the equivalent six-week summer camp at Fort Knox, Kentucky. Travel to and from summer camp is paid for by the Army and the student is paid while at camp. Advanced placement may also be awarded to qualifying veterans. This is then followed by two years of advanced course ROTC. While participating in the program a student will receive a personal expense allowance. Upon completion, the student is awarded a commission in the United States Army and serves from three months to four years of active duty according to the needs of the service and the student's desires. Options also are available for commissioned service in the Army Reserve or the Army National Guard requiring minimal service on active duty.

Awards from the fund will subsidize, in part, expenses incurred by graduate students for presenting the results of research at professional conferences. This program was formerly known as the Travel Grant Program. All graduate students who are dues paying members of the Graduate Student Union are eligible. This grant is to be used as supplemental, last resort funding.

The Walter W. and Margaret C. Jones Fellowship is unrestricted in its support of graduate students at Notre Dame since 1989.

The Rev. J. David Max Memorial Fund, since 1978, has supported clerics who are studying liturgy in the Department of Theology.

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Fellowship programs in the departments of biological sciences and psychology are supported by the National Institutes of Health; in the Center for Environmental Science and Technology by the Department of Education; and in the departments of biological sciences and civil engineering and geological sciences by the National Science Foundation.

Assistantships

Graduate Assistantships

Graduate assistantships are available for qualified students in all doctoral programs.

Research Assistantships

Research assistantships provide support to qualified recipients under research programs sponsored by government, industry, or private agencies.

Tuition Scholarships

The University offers full or partial tuition scholarships to students qualifying on the basis of merit.

International Tuition Scholarships

Established by the University in 1985, these tuition scholarships are available to eligible international students for graduate study.

Other Sources of Financial Support

Graduate Student Union

Conference Presentation Program

Awards from the Graduate Student Union will subsidize, in part, expenses incurred by graduate students for presenting the results of research at professional conferences. This program was formerly known as the Travel Grant Program. All graduate students who are dues paying members of the Graduate Student Union are eligible. This grant is to be used as supplemental, last resort funding.

Research Support

The Joseph F. Doumes Memorial Fund.

This fund was established in 1973 to assist graduate students with costs associated with attendance at workshops and seminars.

The Farabaugh Fund.

This fund, established in 1990, provides funds for graduate research in alcohol and drug abuse.

Retirement Research Foundation Thomas Kirby Memorial Grant.

Supports student research in aging and retirement.

The Albert Zahm Research Travel Fund.

Awards from the fund will subsidize, in part, travel expenses incurred by graduate students for purposes directly related to their research. First priority will be accorded doctoral students who have been admitted to candidacy and whose research is the basis for their dissertation. Research master's degree students who have completed all requirements except the thesis will receive second priority.

Other Sources of Financial Support
**Employment and Loans**

**Office of Financial Aid**
(www.nd.edu/~finaid)

In addition to the student support programs described above, students may apply for federal financial aid opportunities, which include student loans and campus employment. The Office of Financial Aid, located in 115 Main Building, administers all loan and employment eligibility. Please note that while the Office of Financial Aid administers employment opportunities, graduate student employment is also subject to approval by the Graduate School.

In order to be eligible for federal student assistance, a student must be a U.S. citizen, permanent resident, or eligible noncitizen. In general, students must be classified as degree seeking to participate in the federal aid programs and be enrolled at least half-time. The Free Application for Federal Student Aid (FAFSA) is the annual application that must be completed and forwarded to the processing center, listing Notre Dame (Federal School Code 001840) in the appropriate section. Priority processing consideration will occur for those applicants submitting the FAFSA by February 28 for the following fall semester. Applicants should be prepared to submit a signed photocopy of their federal income tax returns and W-2 forms directly to the Financial Aid Office upon request.

**Federal Stafford Loan**

The terms of the need-based Subsidized Federal Stafford Loan Program require that the student borrower repay, with interest, this source of financial assistance. This program is referred to as “subsidized” because of the interest subsidy being paid by the federal government to the lender while the student is enrolled in school as well as during the six-month grace period following enrollment.

The terms of the non-need-based Unsubsidized Federal Stafford Loan Program require that the borrower repay, with interest, this source of financial assistance. This program is referred to as “unsubsidized” because the federal government is not paying the in-school interest to the lender while the student is enrolled in school. Interest on Unsubsidized Stafford Loans begins to accrue after disbursement of the loan funds; however, the student may choose to have the payment of the interest deferred during enrollment and later capitalized (added to the principal) at the time repayment begins. The in-school interest rate (variable, based on the 91-day T-bill plus 1.7 percent) through June 30, 2001, is 7.59 percent.

The following is a list of additional terms of the Subsidized and Unsubsidized Stafford Loan, subject to revision by federal law: three percent origination fee and up to one percent insurance fee; variable interest rate during repayment not to exceed 8.25 percent; repayment begins six months after the student ceases to be enrolled in school on at least a half-time basis and generally extends over a 10-year period; annual Subsidized borrowing limit is $8,500; annual Unsubsidized borrowing limit is $18,500 minus Subsidized eligibility; aggregate Subsidized/Unsubsidized borrowing limit is $138,500.

The amount a student may borrow from the Stafford Loan Program may be limited by other financial assistance received by the student. Financial assistance includes, but is not limited to, the following: fellowships, assistantships, University scholarships, tuition remissions, all types of grants, residence hall appointments, campus employment, and any loan received under the auspices of the Higher Education Act as amended. Should a student’s eligibility be impacted at any time during the loan period, the Stafford Loan will be subject to adjustment. All eligibility changes will be reported to the student’s lender.

**Federal Perkins Loan**

The Federal Perkins Loan is a need-based loan made by the University to assist graduate students experiencing financial hardship. The Perkins Loan Program requires that the student borrower repay, with interest, this source of financial assistance. The following are some additional terms, subject to revision by federal law, of the Perkins Loan: no origination or insurance fee; five percent interest rate; interest and repayment begin nine months after the student ceases to be enrolled in school on at least a half-time basis and generally extends over a 10-year period; annual borrowing limit is $6,000; aggregate borrowing limit is $40,000.

**Student Employment**

Many graduate students working on campus are employed on assistantship agreements directly with their academic departments. Other campus jobs may also be available and are posted on the job board at www.nd.edu/~finaid/job_board.htm. Students interested in this type of employment should submit a written request directly to the Office of Financial Aid for employment consideration.

**The Notre Dame Loan**

The University of Notre Dame is pleased to offer a privately financed student loan program. The University, in cooperation with Citibank and its Student Loan Corporation (SLC), one of our country’s foremost long-term providers of higher education financing programs, is making available a very competitively priced alternative loan program for Notre Dame graduate, law, and graduate business students.

Students considering both the Stafford Loan (subsidized or unsubsidized) and the Notre Dame Loan are strongly encouraged to also consider using Citibank as their Stafford Loan lender, assuming that they have not previously borrowed from another lender. For ease during the repayment period, provisions have been made for such borrowers to have one billing statement sent by Citibank’s Student Loan Corporation, thus providing one monthly repayment process for both loans.

The Notre Dame Loan is a sensible borrowing solution. This alternative loan can help finance your education funding needs. While you invest in your education, your loan will also help you establish a positive credit history. Benefits of this loan program include:

**Low Interest Rate.** Variable interest rate, adjusted quarterly, based upon the 91-day T-bill plus 2.5 percent.

**No Loan Fees.** “No loan fees” means you get 100 percent of the money you borrow. There are no origination or insurance fees—fees other student loans typically charge.

**Cosigner Option.** Graduate, law, and graduate business students who have established a sufficient positive credit history may apply without a creditworthy cosigner. Students with no credit history will need to have a creditworthy cosigner in order to apply. International students (who are not U.S. citizens or permanent residents) must apply with a creditworthy U.S. cosigner.
No Payment While in School. Repayment of accrued interest and principal begins six months after the student ceases to be enrolled in school, not to exceed seven years from the first disbursement of the first loan, and generally extends up to 15 years.

Loan Limits. Eligible students may borrow up to the total cost of attendance less any other financial aid that is awarded.

Additional information and an application for the Notre Dame Loan for graduate, law, and graduate business students may be obtained at www.nd.edu/~finaid/notre_dame_loan.htm or from the Office of Financial Aid.

Standards of Progress
Recipients of federal financial aid must comply with the standards of progress set by their respective departments for their particular programs of study. When failure to maintain progress results in the possible loss of federal aid eligibility, the Office of Financial Aid will notify students in writing. Appeals indicating any mitigating circumstances must be made in writing to the Associate Director of Financial Aid.

Further Information
For additional information on financial aid programs and services offered, please contact the Financial Aid Office by telephone at (219) 631–6436; by fax at (219) 631–6899; or by e-mail at finaid.1@nd.edu.
The Alliance for Catholic Education (ACE) seeks to develop a corps of highly motivated and committed young educators to meet the needs of our country’s most underserved elementary and secondary schools.

Begun in 1994 by Rev. Timothy R. Scully, C.S.C., and Sean D. McGraw, C.S.C., ACE currently has over 150 recent graduates from the University of Notre Dame and Saint Mary’s College, as well as a number of other select colleges and universities. These graduates teach in over 90 parochial schools throughout the urban and rural Southern United States.

To carry out its core teaching mission, ACE recruits talented graduates from a broad variety of undergraduate disciplines, representing a diverse set of backgrounds and experiences, and provides an intensive two-year service experience encompassing professional development, community life, and spiritual growth. These three components are at the heart of the ACE initiative. They aim to provide excellence in education and to maximize opportunities for personal and professional growth for program participants.

ACE teachers undergo an intensive teacher education in Notre Dame’s master of education program under the direction of Michael Pressley. The ACE professional training spans two years and integrates graduate-level course work with an immersion experience in teaching. Over the first two summers after admission to the program, ACE teachers live and study together at the University of Notre Dame. The summer sessions combine an innovative teaching curriculum taught by seasoned practitioners and select faculty from the University of Notre Dame with supervised field experience in both the public and Catholic elementary schools of South Bend, Indiana, and in the Upward Bound Program at Notre Dame.

At the completion of the summer training component, ACE teachers travel to needy parochial schools of the South to serve as full-time teachers during the regular school year. In addition to the support of mentor-teachers in the parochial schools where they teach, all ACE teachers are brought together once during the school year in a retreat setting to deepen and enhance their commitment to becoming professional educators. Upon completion of two years in the ACE program, participants will have fulfilled the requirements for a Master of Education degree and will have provided an urgently needed presence in the lives of our nation’s most needy school children.

In addition to a fully funded graduate program, ACE participants receive a modest monthly stipend, medical insurance, travel reimbursement, and an annual educational award of $4,725 from the Corporation for National Service.

For more information, contact:
Alliance for Catholic Education, University of Notre Dame, Notre Dame, IN 46556
Telephone: (219) 631–7052
E-mail: ace.ace.1@nd.edu
(www.nd.edu/~ace)

Center for Applied Mathematics

Director:
Panos Antsaklis, Professor of Electrical Engineering
(www.nd.edu/~cam)

The Center for Applied Mathematics was established to enhance interdisciplinary use of applied mathematics and to provide support for faculty and student research. The center promotes interaction and cooperation among the Notre Dame researchers using mathematics in a variety of disciplines spanning engineering and science and including business and social sciences. It also helps in faculty development by acting as a University source of information on new mathematical concepts and methods essential for developing and carrying out innovative and timely interdisciplinary research at Notre Dame. The center works closely with the interested departments to formulate, establish, and help coordinate the applied mathematics courses at the University.

Center for Astrophysics

Director:
Grant J. Mathews, Professor of Physics
Associate Director:
Terrence Rettig, Professor of Physics

The Center for Astrophysics at the University of Notre Dame (CANDU) provides a synergistic focal point for various faculty research interests under the common theme of “astrophysical and cosmological origins” and encourages collaborations both within and beyond the University community.

The national and international visibility of Notre Dame within the astrophysics community has steadily increased in recent years. We have world-renowned programs in theoretical/observational cosmology, nuclear astrophysics, cosmic-ray physics, dark matter searches, solar-system formation, and extra-solar planet searches. In addition, Notre Dame has recently made a commitment to the Large Binocular Telescope (LBT) international collaboration.
Research activities of the center focus on a cross-disciplinary effort to explore outstanding scientific questions concerning the origin and evolution of astrophysical phenomena. In addition to the specific scientific missions outlined below, CANDU acts as a cross-disciplinary focal point for interactions among scholars with related interests in other departments such as mathematics, history, philosophy, and the Program of Liberal Studies. Two specific areas of research/collaboration targeted by CANDU fall under the headings of astrophysical and cosmological origins.

**Cosmological origins** includes topics such as the origin and structure of the universe, the big bang, primordial nucleosynthesis, cosmic background radiation studies, measurements of cosmological expansion rate, age, and matter content, the origin and evolution of galaxies, space-time geometry, historical, philosophical, and theological foundations.

**Astrophysical origins** is concerned with the origin of stars and the formation of extraplanetary systems, origin and evolution of the elements in stars and supernovae, origin of cosmic rays, gamma-ray bursts, astrophysical neutrinos, and gravity waves.

The center encompasses a broad range of academic interests and is a focal point for undergraduate and graduate research projects. It provides fellowship support for both undergraduate and graduate students, and it also acts as a forum for public outreach and invited lecture series. The visiting scholars to be supported by the center will include some historians, philosophers, and theologians among the astrophysics researchers, providing a unique academic environment for intellectual progress in these areas.

International visibility and prospects for research funding in the Notre Dame astrophysics program have made a major step forward through the acquisition of observing time on the LBT. When completed, the LBT will be the largest telescope in the world on a single mount. It will provide image resolution as much as ten times better than the Hubble Space Telescope.

Notre Dame researchers have already taken steps to expand on the LBT investment by proposing to NASA a new approach to detect Earth-mass planets orbiting other stars through an innovative gravitational lensing technique. This would be a space-based program, but follow-up LBT observations would be critical for characterizing the properties of the planetary systems that are discovered.

In addition to the LBT, other significant University facilities provide access to the Vatican Telescope; telescope facilities at Mt. Stromlo, Australia, and in South Africa; the Notre Dame nuclear accelerator laboratory; and the Notre Dame Project GRAND cosmic air shower array.

**Core Faculty Members**

Although many faculty members from various disciplines actively participate in the center, the research and proposal initiatives will largely be the result of a core of physics faculty members.

- Grant Mathews, CANDU Director and Professor of Physics
- Terrence Rettig, CANDU Associate Director and Professor of Physics
- John Poirier, Professor of Physics
- Fridolin Weber, Visiting Professor of Physics
- Peter Garnavich, Assistant Professor of Physics
- Christopher Kolda, Assistant Professor of Physics
- David Bennett, Research Associate Professor of Physics

**Center for Environmental Science and Technology**

**Director:**

Charles F. Kulpa Jr., Professor of Biological Sciences

E-mail: cest.1@nd.edu

(www.nd.edu/~cest)

The Center for Environmental Science and Technology (formerly Center for Bioengineering and Pollution Control), established during the summer of 1987, conducts basic scientific and engineering research that involves faculty from all divisions of the graduate school. The center serves as a focal point for the promotion and encouragement of the following activities:

1. Conduct basic research in pollution control that combines microbiology, biochemistry, physical chemistry, mathematics, and physics with engineering.
2. Educate undergraduate and graduate science and engineering students to the need for and methods of science-based environmental research.
3. Develop innovative technologies grounded in sound scientific principles for application to environmental problems.
4. Develop interdisciplinary teams to apply cutting-edge technologies to real world problems in many areas of national and international concern.

The center formalizes a multidisciplinary research effort that has taken place between the College of Science and the College of Engineering during the past three decades. The goals of the center are (1) to establish scientific study of pollution problems as an attractive career option for young scientists and engineers, (2) to develop a truly comprehensive research and educational program, and (3) to ensure the existence of basic scientific knowledge needed to address current and future pollution control problems.

Students connected with the center are enrolled in one of the participating departments (e.g., biological sciences, chemical engineering, chemistry and biochemistry, civil engineering and geological sciences, mathematics, physics, or anthropology) regular degree programs or are visiting students. The center supports students through the Bayer endowment for predoctoral and postdoctoral fellowships, in addition to various intern-ship opportunities.

Inquiries about the activities of the center should be addressed to University of Notre Dame, Charles F. Kulpa Jr., Director, Center for Environmental Science and Technology, 152A Fitzpatrick Hall of Engineering, Notre Dame, IN 46556.

**Center for Molecularly Engineered Materials**

**Director:**

Arvind Varma, Arthur J. Schmitt Professor of Chemical Engineering

**Associate Director:**

Paul J. McGinn, Professor of Chemical Engineering

Materials engineered at the molecular level offer tremendous potential for new technological applications, especially in key industries such as aerospace, automotive, biomaterials, chemicals, defense, electronics, energy, metals, and telecommunications.

The Center for Molecularly Engineered Materials actively explores multidisciplinary fundamental concepts in materials science and engineering, with emphasis on the study of materials at the molecular level. At
Notre Dame, it is the primary interdisciplinary unit dedicated to the molecular-level design, synthesis, characterization, and development of advanced materials.

The center’s objective is to utilize molecular-level engineering of materials to explore promising technological applications in a variety of fields ranging from catalysts, adsorbents, and sensors to fuel cells, biomaterials, and nanomagnetics. An important focus of the center is integrating materials engineering over length scales from the molecular up to macroscopic dimensions so as to have maximum utility. A key goal is to serve as a national resource for exploring long-range molecular-level materials engineering concepts for applications that would otherwise not be possible due to the near-term focus of the commercial sector.

The aim is to develop materials and systems whose structure and components exhibit novel and significantly improved physical, chemical, and biological properties, phenomena, and processes, due to their molecular-scale design and engineering. Included among the areas of emphasis are the synthesis and characterization of new materials with features on the molecular scale, experimental studies and mathematical modeling, and advanced processing techniques. For example, molecular-level synthesis and assembly methods will result in chemical/biological sensors with improved accuracy and sensitivity that can rapidly test large quantities of food for bacterial contaminants or airborne toxins; novel catalyst structures that provide both high-volume chemical, petroleum, and pharmaceutical processing; significant improvements in semiconductor interfaces for solar energy conversion; environmentally benign corrosion inhibitor design; electrolyte and electrode design for the production of nanoscale patterning for electronic, magnetic, optical, and membrane use; semiconductor interfaces for solar energy conversion; spatial manipulation of objects on the nanometer scale; surface patterning via microcontact printing; and scanning probe lithography. The user base is extensive and includes all metal producers and users as well as chemical, petroleum, and electronics industries.

The center integrates interdisciplinary research groups in catalysis and reaction processes, electrochemical interfaces and processes, nanostructured materials, and advanced processing techniques, and includes researchers from the Department of Chemical Engineering, the Department of Chemistry and Biochemistry, and the Radiation Laboratory. The thrust activities are synergistically planned, coordinated, and executed so as to provide a coherent approach to targeted and evolving concepts.

**Interdisciplinary Research Groups**

**IRG 1: Catalysis and Reaction Processes**

This group focuses on steady state and dynamic aspects of adsorption and reaction processes occurring primarily on heterogeneous catalytic surfaces. This includes synthesis and characterization of new materials with potential for applications in heterogeneous catalysis, including covalently bound cluster arrays, microporous transition-metal phosphates, and porous amorphous materials. Applications include catalyst design for reactivity and selectivity; design and operation of single and multiphase reactors; photochemical reactions carried out by fast pulsed lasers; and strategies for reaction mixture, catalyst, and reactor design for environmental applications. The user base includes chemical, petroleum, utility, and manufacturing industries that require chemical transformations for either production or environmental protection reasons.

(Brennecke, Brown, Chang, Fehlner, Leighton, McCready, McGinn, Sevov, Strieder, Varma, Wolf (IRG Leader))

**IRG 2: Electrochemical Interfaces and Processes**

The focus of this effort is the experimental study and mathematical modeling of chemical reactions and their physical patterns that occur at interfaces when placed in electrolytes with or without electric fields. Applications include the design of passive layers that resist corrosion by pitting; environmentally benign general corrosion inhibitor design; electrolyte and electrode design for the production of nanoscale patterning for electronic, magnetic, optical, and membrane use; semiconductor interfaces for solar energy conversion; spatial manipulation of objects on the nanometer scale; surface patterning via microcontact printing; and scanning probe lithography. The user base is extensive and includes all metal producers and users as well as chemical, petroleum, and electronics industries.

(Chang, Kumat, Lieberman, Meisel, Miller (IRG Leader), Strieder)

**IRG 3: Nanostructured Materials**

The focus of this area is on developing novel materials having characteristic features in the nanometer range that uniquely define their properties. The nanostructured materials that are synthesized and studied include self-assembled layers, main-group clusters, metal and semiconductor nanoparticles, functionalized mesoporous silicas, and nanostructured membranes. Areas of application include adsorption, separations, fuel cells, encapsulation, biocatalytic membranes, nonlinear optics, sensing technology, self-assembled films, nanomagnetics, and environmental remediation. These technologies are critical in the chemical processing, pharmaceutical, automotive, energy storage/conversion, and petroleum industries.

(Kamat, Lieberman, Maginn (IRG Leader), Meisel, Miller, Ovaaet, Paolucci, Sevov, Stadtherr, Varma)

**Associated Faculty**

**Department of Aerospace and Mechanical Engineering**

Samuel Paolucci, Professor
Timothy Ovaert, Professor

**Department of Chemical Engineering**

Joan Brennecke, Professor
Hsueh-Chia Chang, Bayer Corporation
Professor of Chemical Engineering
Davide Hill, Associate Professor
David Leighton, Professor
Edward Maginn, Associate Professor
Mark McCready, Professor and Department Chair
Paul McGinn, Professor
Alice Ovaaet, Assistant Professor
Mark Stadtherr, Professor
William Strieder, Professor
Arvind Varma, Schmitt Professor of Chemical Engineering
Eduardo Wolf, Professor

**Department of Chemistry and Biochemistry**

Seth Brown, Assistant Professor
Thomas Fehlner, Grace-Rupley Professor of Chemistry and Biochemistry
Mary Lieberman, Assistant Professor
Marvin Miller, Clark Professor of Chemistry and Biochemistry
Center for Nano Science and Technology

Director:
Wolfgang Porod, Professor of Electrical Engineering
Alan C. Seabaugh, Professor of Electrical Engineering
(www.nd.edu/~ndnano)

Research conducted in the Center for Nano Science and Technology entails the study of small device structures and device-related phenomena on a spatial scale of less than one-tenth of a micron—that is, one thousandth the diameter of a human hair. The center integrates research thrusts in molecular- and semiconductor-based nanostructures, device concepts and modeling, nanofabrication, electrical and optical characterization, and integrated systems-level design to address common application goals.

The center comprises a multidisciplinary collaboration of faculty from the departments of electrical engineering, computer science and engineering, chemistry and biochemistry, and physics who are exploring fundamental concepts and issues in nano science and developing unique engineering applications using principles of nano science. The center was established on a base of 15 years of faculty research and educational development at Notre Dame in nano science and technology.

At present, center faculty are engaged in such initiatives as quantum-based devices and architectures; high-speed resonant-tunneling devices and circuits; photonic integrated circuits; the interaction of biological systems with nanostructures; and the design and fabrication of microelectromechanical systems.

In addition to training students for immediate participation in nano science and technology and preparing them to be productive and extremely competitive in the future marketplace, the center also allows faculty to conduct avant-garde research and provides industry leaders with a forum, a “think tank,” to explore long-range ideas. Involvement with industrial technologists also benefits students by providing experience in working with the commercial sector.

Keck Foundation Initiative
The W.M. Keck Foundation Initiative on “Integrated Nanoelectronics: Information Processing at the Molecular Level” is a major research program within the Center for Nano Science and Technology.

This initiative explores the use of nanoelectronics in developing radically different approaches to information processing. The research aims to combine novel device concepts with both fundamental fabrication issues in physics and chemistry and higher-level integration issues of systems, architectures, and algorithms. This initiative builds on the notion of Quantum-Dot Cellular Automata (QCA), a concept developed at Notre Dame, which is based on encoding binary information through the charge configuration of quantum-dot cells.

Facilities
The center has excellent on-site research facilities and capabilities including nanolithography and scanning tunneling microscopy; nanodevice and circuit fabrication; nano-optical characterization including femtosecond optics and near-field scanning optical microscopy; electrical characterization at helium temperatures and in 10 T magnetic fields; 50 GHz high-speed circuit analysis; and device and circuit simulation and modeling. In recent years, federal grants received to support research in nano science and technology total approximately $10 million, including two major grants from DARPA, the ULTRA MOLECTRONICS programs, and several other awards from NSF, ARO, and ONR.

The Integrated Circuit Laboratory
(Bernstein, Fay, Hall, Kosel, Merz, Minniti, Snider)
This laboratory allows fabrication of ICs and devices with geometries to 0.02 microns. In clean room areas are a photomask generator, contact mask aligners, wafer stepper, furnace tubes, plasma etcher, LPCVD, PECVD, RIE, RTA, wire bonders, and several evaporators. Inspection includes a JEOL SEM and Hitachi S-4500 FESEM, JEOL TEM, ellipsometer, prism coupler, surface profiler, and 4-point probe. Nanolithography is by a 50 kV SEM/EBL. Advanced measurement capabilities include HP 4145B SPA, Tek 20-GHz network analyzer, Hall Effect, DLTS and Keithley I-V and C-V systems.

The Optoelectronics Laboratory
(Hall)
Extensive equipment dedicated to compound semiconductor processing and optoelectronic materials and device characterization includes a 10-watt Argon laser, cw Titanium Sapphire laser, diode lasers, related detector and optical systems for photoluminescence and waveguide analysis, an optical spectrum analyzer, and an optical fiber fusion splicer.

The Cryogenic Characterization Laboratory
(Snider, Bernstein)
In this laboratory, electrical measurements of devices can be performed anywhere between room temperature and 10 mK, and in magnetic fields up to 11T. Several cryogenic systems are available, including a 300 mK helium cryostat and a dilution refrigerator. This facility specializes in low noise measurements, especially useful for the nanoelectronics effort.

The Nano-Optics Laboratory
(Merz)
This laboratory includes a 15-watt Argon ion laser, a tunable mode-locked Titanium Sapphire laser delivering femtosecond pulses, a near-field scanning optical microscope (NSOM), several Helium cryostats, and spectrometers. This facility provides unique capabilities for ultra-high spatial, temporal, and spectral resolution measurements from cryogenic to room temperatures, and with magnetic field strengths of up to 12 Tesla. A Digital Instruments Atomic Force Microscope is also available.

The High-Speed Circuits and Devices Laboratory
(Fay, Bernstein)
The High-Speed Circuits laboratory houses a state-of-the-art MMIC design and characterization facility, which includes a Cascade microwave probe station, a 40 GHz vector network analyzer, 50 GHz synthesized source, 50 GHz spectrum analyzer, 50 GHz digital storage oscilloscope, and a 12.5 Gb/s digital pulse pattern...
generator, with extended capability for optoelectronic characterization of high-speed detector and photoreceiver subsystems. (www.nd.edu/~micro)

**The Device Simulation Laboratory**
(Porod, Lent)
This laboratory has a state-of-the-art cluster of Sun Workstations, with graphics capability and ready access to supercomputers.

**Faculty**
**Department of Electrical Engineering**
Gary Bernstein, *Professor* (Thrust Leader)
Patrick Fay, *Assistant Professor*
Douglas Hall, *Associate Professor*
Yih-Fang Huang, *Professor*
Thomas Kosel, *Associate Professor*
Craig Lent, *Professor* (Thrust Leader)
James Merz, *Freimann Professor of Electrical Engineering*
Wolfgang Porod, *Professor* (Director)
Alan Seabaugh, *Professor* (Associate Director)
Gregory Snider, *Associate Professor*

**Department of Computer Science and Engineering**
Peter Kogge, *McCourtney Professor of Electrical Engineering* (Thrust Leader)
Jay Brockman, *Associate Professor*
Jesus A. Izaguirre, *Assistant Professor*

**Department of Chemical Engineering**
Agnes E. Ostafin, *Assistant Professor*

**Department of Physics**
Jacek Furdyna, *Marquez Professor of Physics* (Thrust Leader)
Malgorzata Dobrowolska-Furdyna, *Professor* Boldizar Janko, *Assistant Professor*

**Department of Chemistry and Biochemistry**
Thomas Fehlner, *Grace-Rupley Professor of Chemistry and Biochemistry* (Thrust Leader)
Holly V. Goodson, *Assistant Professor*
Gregory Hartland, *Associate Professor*
Paul Huber, *Associate Professor*
Marya Lieberman, *Assistant Professor*
Olaf Wiest, *Associate Professor*

**Center for Philosophy of Religion**
*Director:*
Alvin Plantinga, *John A. O’Brien Professor of Philosophy*

The Center for Philosophy of Religion was established at the University of Notre Dame in the fall of 1976. Although operating in close association with the Department of Philosophy, it is not a degree-granting institution. Its aim is to advance the understanding of religion and religious belief and to promote and advance a specifically Christian and theistic approach to some of the main topics and problems of philosophy.

In pursuit of these goals, the center sponsors several different sorts of activities. First, it offers stipendiary fellowships on a competitive basis to scholars who then come to Notre Dame to work on projects in philosophy of religion and Christian philosophy. It also extends nonstipendiary resident fellowships to scholars who are on sabbatical leave and would like to come to Notre Dame to work on a topic in Christian philosophy or philosophy of religion; such fellows receive guest faculty status and secretarial services.

The center periodically sponsors conferences and lectureships on selected issues.

The center also publishes a series of volumes that includes conference proceedings and monographs. The center will address its subject from within a posture that is committed and Christian; its perspective (though not necessarily that of its fellows and lecturers) is that of the committed believer, rather than one of artificial neutrality.

Inquiries about the activities of the center should be addressed to University of Notre Dame, Prof. Alvin Plantinga, Director, Center for Philosophy of Religion, Notre Dame, IN 46556. E-mail: cprelig.1@nd.edu (www.nd.edu/~cprelig)

**Center for Tropical Disease Research and Training**

This world renowned research group includes faculty whose interests center on human parasites and their arthropod vectors as well as the host response to infection. The vector biologists’ research interests include genetics, genomics, reproductive physiology, vector competence and immunity, insecticide resistance, biomics, population genetics, and systematics. The major vector groups studied include mosquito vectors of malaria parasites, filarial worms, and arboviruses as well as tick vectors of the causative agents of Lyme disease and erlichiosis. This center’s laboratories house the World Health Organization’s *Aedes* Reference Center, a large reference collections of *Anopheles* species and genetic strains, and an extensive set of genomic and cDNA libraries from the malaria vector *Anopheles gambiae* and the yellow fever vector *Aedes aegypti*.

The research interests of the parasitologists include comparative biochemistry, immunology, pharmacology, cell biology, genetics, genomics, and vaccine development. The major parasitic organisms studied include malaria parasites, Leishmania, Toxoplasma, Mycobacteria, filarial nematodes, and Erlichia. Ongoing research projects involve functional assays of recombinant proteins, population genetics and transmission of malaria parasites, gene expression and protein trafficking in parasitic protozoa, isolation of mycobacterial virulence factors, signal transduction in mycobacterial-infected cells, and *Plasmodium* genomics.

Excellent facilities exist for studies involving parasite biochemistry, molecular biology, cell biology, electron and confocal microscopy, large scale DNA and cDNA sequencing, microarray and quantitative gene expression analysis, and animal models (including work with nonhuman primates). Most of the faculty in this program study not only vectors and pathogens of importance in the United States but also tropical parasites and their vectors in several locations in Africa, Papua New Guinea, the Caribbean, and South America. Research projects also utilize the University of Notre Dame’s Environmental Research Center (UNDERC) in Michigan’s Upper Peninsula. Excellent facilities exist for genomic and postgenomic studies through the department’s involvement with the Indiana Center for Insect Genomics, a significant part of which is located on the Notre Dame campus.

Faculty in the Center for Tropical Disease Research and Training receive support from major federal funding agencies such as the NIH, NSF, and USDA, from private foundations like the John D. and Catherine T.
MacArthur Foundation, the Gates Foundation, and the Wellcome Trust, from international funding bodies like the World Health Organization, and from the University of Notre Dame. The program has had an NIH Training Grant for almost 30 continuous years that has supported graduate students and postdoctoral fellows. Genome projects for two species of mosquitoes, *Anopheles gambiae* and *Aedes aegypti*, and a number of other insects are coordinated through grants to center faculty. These faculty also direct and participate in the Indiana Center for Insect Genomics, a collaborative network of Indiana academic and biotechnology institutions that conducts genomic research with insects of both medical and agricultural importance.

**Faculty in the Center for Tropical Disease Research and Training**

John H. Adams, Associate Professor (Molecular and Cellular Biology and Parasitic Protozoa)

Nora J. Besansky, Associate Professor (Molecular Evolutionary Genetics of Mosquitoes)

Frank H. Collins, George and Winifred Clark Professor, Director of the Centers for Tropical Disease Research and Training, and Director of the Indiana Center for Insect Genomics (Genetics and Genomics of Arthropod Vectors of Human Pathogens)

Michael T. Ferdig, Assistant Professor (Integrated Genomic Approaches to Identify Genes Underlying Complex Phenotypes in the Malaria Parasite *Plasmodium falciparum* )

Malcolm J. Fraser Jr., Associate Professor (Molecular Biology and Genetics of Viruses)

Paul R. Grimstad, Associate Professor (Vector-Borne Disease Ecology and Epidemiology)

Kristin M. Hager, Assistant Professor (Cell Biology and Genetics of Apicomplexan Protein Secretion)

Ronald A. Hellenthal, Professor, Gillen Director of UNDERC (Systematics of Ectoparasites)

Mary Ann McDowell, Assistant Professor (Immunology of Leishmania-Host/Parasite Interactions)

Jeffrey S. Schorey, Assistant Professor (Immunology and Cell Biology of Mycobacterium-Host Cell Interactions)

David W. Severson, Associate Professor (Quantitative and Population Genetics of Mosquito Vectors and *Aedes aegypti* Genomics)

Thomas Streit, Assistant Research Professor (Field Epidemiology of Filariaisis and Dengue Transmission)

(www.science.nd.edu/biology/programs/parasitology.html)

**Charles and Margaret Hall Cushwa Center for the Study of American Catholicism**

**Director:**
Scott Appleby

**Associate Director:**
Kathleen Sprows Cummings

**Associate Director:**
Christopher Shannon

**Background**

In 1976 the University established the Center for the Study of American Catholicism to promote and encourage the scholarly study of the American Catholic tradition.

In 1980 Mrs. Margaret Hall Cushwa of Youngstown, Ohio, widow of Charles Cushwa, a 1931 alumnus of Notre Dame, made a generous gift to endow the work of the center, which was formally dedicated in 1981. Thus it was that the Charles and Margaret Hall Cushwa Center for the Study of American Catholicism was given official status and permanence.

**Activities**

The activities of the Cushwa Center embrace four areas: instruction, research, publication, and collection of materials pertinent to the study of American Catholicism. In each of these areas the center pursues a multidisciplinary approach, not limiting its activities or programs to any one particular methodology or discipline.

At present the center publishes the semiannual *American Catholic Studies Newsletter*. This publication reports on the latest scholarship taking place in American Catholic studies, features personal news items, provides information on major archival holdings in the United States, and publishes essays on dissertation research.

The center sponsors the *American Catholic Studies Seminar*. Scholars from across the country are invited to present papers at the seminar, which is held at the University several times a year. Published in a working paper format, these papers are available to the public for the cost of mailing.

The center also sponsors the *Notre Dame Seminar in American Religion*, a gathering of selected historians of American religion, as well as major conferences.

In conjunction with the University of Notre Dame Press, the Cushwa Center sponsors a publication series, *Notre Dame Studies in American Catholicism*. Each year a competition is held to select the best book-length manuscript in the field of American Catholic studies. The author of the winning manuscript receives a $500 prize and the award-winning book is published by the University of Notre Dame Press.

The center awards research travel grants to assist scholars who wish to use the University’s library and archival collection of Catholic Americana.

The center also administers a program of lectures, fellowships, and conferences related to the Irish-American experience. In addition, it sponsors a publication series, *The Irish in America*. Manuscripts for this series are selected in an annual competition. These activities are funded by an endowment from the Ancient Order of Hibernians and its Ladies Auxiliary.

The center has sponsored research projects that have examined the history of American Catholic theological education, the Catholic parish in the United States, and the relationship between the parish and ministry in the American Catholic community. It recently completed a historical study of Hispanic Catholics in 20th-century United States.

The center, with a generous grant from the Lilly Endowment and additional support from the University of Notre Dame, is currently engaged in a new program of research, “Catholicism in Twentieth-Century America.” The project seeks to integrate the experiences and contributions of Catholics more fully into the narratives of American history, to enhance collaboration between historians of Catholicism and other American historians and social scientists, and to promote the study of Catholicism by graduate students and by established scholars working outside the field. The project completed its initial three-
projects funded to date through to publica-
ing. The center is currently engaged in guiding the individual research during the year period of fellowship funding in the spring of 2000. The center is currently engaged in guiding the individual research projects funded to date through to publication as monographs in a series, “Cushwa Center Studies of Catholicism in Twentieth-Century America,” to be published by Cornell University Press under the general editorship of Scott Appleby.

**Erasmus Institute**

**Director:**
James Turner, Rev. John J. Cavanaugh, C.S.C., Professor of the Humanities and Professor of History
Senior Associate Director:
Rev. Robert E. Sullivan, Associate Professor of History
**Assistant Director:**
Kathleen L. Sobieralski
**Fellowship Administrator:**
Terri O’Reilly

The Erasmus Institute was founded to foster research grounded in Catholic intellectual traditions and focused on significant issues in contemporary scholarship. Its mission is not to advance study of the church or theology as such, but rather to bring resources from two millennia of Catholic thought to bear on problems in the humanities, social sciences, and arts. An exemplary case is the use by Sara Maitland of theological perspectives to illuminate the structure and limits of the modern novel: a contribution to literary understanding significant to all scholars in the field, regardless of religious belief. Another is Jean Bethke Elsholtz’s work on just-war theory in political science: a discourse drawing heavily on Catholic thinkers, especially Augustine, but as important to secular-minded political theorists as to Christian ones. One can imagine analogous research involving notions of the body in gender studies, conceptions of authority in sociology, or historical studies of religious sources of apparently secular institutions or modes of thinking. The institute favors first-order scholarship over policy-oriented or applied investigations. Though concerned primarily with the Catholic intellectual heritage, the institute supports complementary research deriving from other Christian intellectual traditions as well as from Jewish and Islamic ones. It invites the participation of scholars without regard to religious belief.

In order to qualify for support, a project must meet only two criteria: it must involve original research on a specific problem in the humanities, social sciences, or arts (broadly defined to include professional fields such as law and management), and it must draw substantially in addressing this problem on Christian, Jewish, or Islamic intellectual traditions. “Traditions” are understood to include their contemporary expressions as well as older ones, ranging from the Hebrew Bible to present-day theology. But it does not suffice simply to study these religions or their intellectual traditions for their own intrinsic interest.

By encouraging work of this sort, the institute hopes, on the one hand, to enrich our common academic efforts with neglected assets and, on the other, to strengthen ties between the church’s intellectual life and that of the academy. In so doing, the institute seeks to promote scholarship of high quality, reflecting a broad array of interests, without aligning itself with any ideological perspective.

International in the scope of its mission, the Erasmus Institute offers residential fellowships at its center on the campus of the University of Notre Dame. These include faculty, postdoctoral, and dissertation fellowships. It also organizes conferences and colloquia on campuses in this country and abroad, sponsors a publication program, and arranges summer seminars for graduate students and faculty.

The Erasmus Institute is generously supported by The Pew Charitable Trusts and by the bequest of William J. Carey. For further program information or for fellowship or summer-seminar application materials, please visit our Web site or contact

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E-mail: erasmus@nd.edu
(www.nd.edu/~erasmus)

**Hessert Center for Aerospace Research**

**Director:**
Patrick F. Dunn, Professor of Aerospace and Mechanical Engineering

The Hessert Center for Aerospace Research is a building dedicated in 1991, which houses a variety of specialized experimental research facilities, graduate students, and faculty. The center is primarily used by faculty and students in the Department of Aerospace and Mechanical Engineering, but a number of collaborative research projects with faculty and students from other University departments also utilize the center’s facilities.

The Main Laboratory in the center contains a wide variety of research wind tunnels. These include indraft subsonic tunnels, indraft and blowdown transonic and supersonic tunnels, an anechoic wind tunnel, an atmospheric wind tunnel, and a closed circuit water tunnel. These wind tunnel facilities are supported by data acquisition and instrumentation including laser doppler anemometry, particle image velocimetry, hot-wire anemometry, and force balance capabilities for both subsonic and supersonic flows. These facilities are currently being used to perform research in areas of flow stability and transition, high angle of attack and high lift aerodynamics, bluff body flows, aero-acoustics, and fluid-structure interactions.

The center also contains a number of specialized laboratories including those for the study of the dynamics of solid and liquid particles and the development of aero-optic measurement techniques. The Hessert Center is used for a variety of graduate and undergraduate educational programs including experimental measurements. All of the research and educational facilities are supported by electronics and machine shops.

(www.nd.edu/~amewww/Hessert.html)

**Institute for Church Life**

**Executive Director:**
John Cavadini, Ph.D., Chair of the Theology Department and Associate Professor of Theology
Administrative Director:
Rev. Joseph E. Weiss, S.J., Ph.D., Professional Specialist and Concurrent Associate Professor of Theology

The Institute for Church Life (ICL) of the University of Notre Dame exists as an integral component of the University’s larger mission of teaching, research, and service to society and to the Church. Through its resources, projects, and affiliate centers the institute reaches out to the whole spectrum of Church leaders—its
bishops, clergy, religious, and laity—to provide training and service as well as opportunities for spiritual rejuvenation and personal growth.

In this work, the institute seeks to embody the spirit and mandate of the Second Vatican Council, to implement a mission of transforming the Church and society in light of the Gospel, and to renew the theological, ministerial, pastoral, catechetical, and liturgical traditions of the Church. In part the institute’s efforts are realized through its ongoing collaboration with the Center for Pastoral Liturgy, the Center for Social Concerns, Vocare (the Notre Dame Vocation Initiative) Retreats International, the Satellite Theological Education Program, and the academic departments and schools of the University of Notre Dame, especially the Department of Theology.

For more than 25 years, ICL has provided distinguished leadership through its publications, training sessions, service to episcopal and national organizations, involvement in social concerns, research, and educational programs. Guided by its Executive Committee, ICL is expanding its programs and initiatives for the special needs of a Church at the beginning of the new millennium.

As a bridge between the University and the Church, ICL links programs and personnel on campus with Church leaders, University graduates, and others who are concerned with the development of vital communities of faith. Further, with the assistance of the Advisory Council, ICL hopes to serve as a catalyst for cooperation among a variety of entities within the University and within the Church.

The institute is additionally challenged by staying conversant with the major currents of research on the Church and for initiating appropriate new research to enable the responsible development of the Church’s intellectual and pastoral life.

**The Components of the Institute for Church Life**

**Center for Pastoral Liturgy**

*Director:* TBA

Established in 1971, the Notre Dame Center for Pastoral Liturgy was designated by the bishops in the United States as an official liturgical center. It is concerned primarily with the pastoral dimensions of the reform of liturgy that express and shape the religious experience of people. Bringing together a variety of resources, the center’s staff provides educational programs on the liturgy and pastoral life to assist parishes and dioceses with renewal of worship.

The center also sponsors an annual conference at Notre Dame as well as regional conferences, and publishes a newsletter, *Assembly*, and books on various aspects of worship. The center sponsors two organizations for liturgists: *Liturgy Network* and *Liturgy Resources*. The center is a part of the Institute for Church Life and collaborates with the Department of Theology’s liturgical studies program.

**Center for Social Concerns**

*Executive Director:* Rev. Don McNell, C.S.C., Professional Specialist and Concurrent Associate Professor of Theology

The Center for Social Concerns is part of a creative partnership with the Institute for Church Life through common pastoral planning, collaborative efforts, and a common advisory council.

The center offers programs aimed at raising the consciousness of students, faculty, staff, and alumni to social, cultural, and justice issues in our society. Experiences in the South Bend area, throughout the United States, and internationally are developed for participating students and enhanced with course work, readings, and discussion. The staff also works with faculty to assist them in incorporating into their courses information about justice issues, as well as experiential and community-based service learning models appropriate to their courses. By providing opportunities for students, faculty, administrators, and alumni to increase their social awareness, the center staff hopes to promote social concern among the University community and constituents on and off the campus. The center staff invites the discussion of self-initiated social justice, service, and leadership opportunities with interested graduate students.

(centersocialconcerns.nd.edu)

**Retreats International**

*Executive Director:* Anne Luther, Ph.D.

Retreats International (RI) is another component of the Institute for Church Life and is headquartered at the University in the Hesburgh Library building.

An international organization serving the larger retreat movement, Retreats International currently has some 360 member retreat centers and houses of prayer. It is estimated that almost three million people participate in retreats and other programs of spiritual renewal annually. RI is a professional organization, the responsibility of which is to encourage ongoing formation and development. RI provides the structure and format for networking and collaboration among its members, gathers and publishes significant data pertinent to retreat/renewal ministry, and publishes various monographs on topics of interest to those involved.

Retreats International is administered by a board of trustees elected from its membership in consultation with a council of area representatives. This council is composed of individuals elected from the 21 areas into which RI is divided.

Retreats International conducts a Summer Institute on the University campus that attracts more than 600 persons involved in many church ministries. The Summer Institute’s purpose is ongoing formation of retreat personnel and theological and spiritual renewal and updating for others representing a wide range of ministries and geographic areas. In this way the Summer Institute reaches out to those who have completed their academic work and offers them further opportunities for adult faith development.

**Satellite Theological Education Program**

*Director:* Thomas C. Cummings, M.Div.

STEP provides quality theological education to pastoral ministers and other adult Catholics across the country. Now in its third year STEP will offer six certificate eCourses beginning in the fall semester of the academic year 2001-2002. These courses are the beginning of what will become multiple-course components in different theological subjects that students may use as continuing education for their
ministry or as adult education for their edification and faith development.

Institute Days are another primary educational service of STEP. Institute Days are single-day events conducted simultaneously in various dioceses. Each day consists of opening and closing prayer, a videotape lecture on the day’s topic, and a video conference that connects downlink sites with the expert presenter on the videotape. Groups across the country gain not only from being able to ask the expert questions about the material, but also by hearing questions from Catholic students in dioceses far from their own who share similar concerns. Institute Days are wonderful learning events for parish staff, study groups, and Catholic educators. Five events will be offered during the 2001-2002 academic year.

Vocare, the Notre Dame Vocation Initiative
Director:
Stephen H. Camilleri

Vocare, the Notre Dame Vocation Initiative, was established to help students “understand their future work in light of their faith commitments and provide talented young people with opportunities to explore ministry, either lay or ordained, as their life’s work.” It enhances the University of Notre Dame and specifically the Institute for Church Life’s “capacity to draw on the resources of its mission, heritage, and religious tradition in preparing a new generation of leaders for church and society.”

Vocare intends to foster a sense of vocation in a broad range of youth, from high-school students to young adults who have graduated from college. It has three component programs. The first component program is a series of initiatives directed to Notre Dame students and faculty. This program provides incentives and structures for faculty fellowships, curricular revisions, speakers, and learning experiences outside the classroom. These initiatives have the direct effect of influencing students to think of their life choices in terms of a sense of vocation, and to have the indirect effect of shaping university culture so that vocation becomes a customary category of reflection and conversation on campus.

Following on this initiative directed to students and faculty are two outreach component projects, one to high-school youth and the other to Notre Dame young alumni/ae. The latter is intended as a follow-up to helping our own ND graduates as they make the transitions into careers. The other outreach, to high-school-age youth, will make the resources of the University available to a wider public.

Institute for Educational Initiatives
Director:
Rev. Timothy R. Scully, C.S.C.
Executive Vice President of the University, Professor of Government and International Studies

Executive Committee
John G. Borkowski, McKenna Professor of Psychology
Anthony S. Bryk, Director, Center for School Improvement and Consortium on Chicago School Research; Marshall Field Professor of Sociology, University of Chicago
Joseph Conaty, Office of Elementary and Secondary Education, U.S. Department of Education
Adam Gamoran, Professor of Sociology, University of Wisconsin
Maureen Hallinan, Director, Program on the Social Organization of Schools
Joyce V. Johnstone, Director of Educational Outreach, Alliance for Catholic Education
G. Michael Pressley, Academic Director, Alliance for Catholic Education
Rev. Timothy Scully, C.S.C., Director, Institute for Educational Initiatives
John J. Staud, Director of Administration and Pastoral Formation, Alliance for Catholic Education

Program on the Social Organization of Schools
Director:
Maureen T. Hallinan, Ph.D., Director, Program on the Social Organization of Schools; White Professor of Sociology
David Sikkink, Ph.D., Associate Professor of Sociology
Warren Kubitschek, M.A., Research Associate
Elizabeth McEneaney, Ph.D., Postdoctoral Fellow

Alliance for Catholic Education
John Staud, Ph.D., Director of Administration and Pastoral Formation, Concurrent Assistant Professor of English

Alfred J. Stashis, Jr., M.A.T., Senior Associate Director
Mary Jo Adams, M.A.T., Associate Director
Christian M. Dallavis, M.A.T., Associate Director
G. Michael Pressley, Ph.D., Director of the Master of Education Program, Notre Dame Professor of Catholic Education, Professor of Psychology
Patrick D. Daunt, Ph.D., Coordinator of Field Supervision
Rachel S. Moreno, Ed.D., Clinical Supervisor
John L. Watzke, Ph.D., Clinical Supervisor
Joyce V. Johnstone, Ph.D., Director of Educational Outreach
John R. Eriksen, M.A.T., Associate Director for Educational Outreach
John A. Schoenig, M.Ed., Special Projects Associate

Mendelson Center for Sport, Character, and Culture
Brenda Light Bredemeier, Ph.D., Codirector
David Light Shields, Ph.D., Codirector
F. Clark Power, Ed.D., Associate Director; Professor and Chair, Program of Liberal Studies; Concurrent Professor of Psychology
Matthew L. Davidson, Ph.D., Research Associate

Mission Statement
The Institute for Educational Initiatives (IEI), established in 1997, aims to improve the education of all youth, particularly the disadvantaged. To achieve this end, the institute conducts three programs designed to address specific educational goals. These are the Program on the Social Organization of Schools, the Alliance for Catholic Education (ACE), and the Mendelson Center for Sport, Character and Culture. Through the research and teaching of these programs, the institute seeks to contribute to the revitalization of American education and, consistent with Notre Dame’s mission as a Catholic university, to benefit parochial education in a special way.

The Program on the Social Organization of Schools conducts basic and applied research on school and the learning process. Researchers study the formal and informal organization of schools, the curriculum, teacher practices, and student social relationships in an effort to determine how
these factors interact with student background and ability to affect student learning. Special attention is given to the study of Catholic schools, particularly in reference to the education of at-risk students.

The Alliance for Catholic Education seeks to develop a corps of highly motivated and committed young educators to meet the needs of our country’s most underserved elementary and secondary schools. ACE teachers undergo an intensive teacher education program that spans two years and integrates graduate-level course work with an immersion experience in teaching. This program provides rigorous and innovative training to graduate students from a wide variety of disciplinary backgrounds who are interested in teaching. At the completion of their training, students receive a Master of Education degree, and qualify for licensing in various states. ACE teachers live together in supportive communities designed to nurture their professional and spiritual growth and become part of the local parochial and neighborhood school communities, as they prepare to become reflective professional educators and people of faith.

The ACE Program also seeks to influence and support Catholic education through educational outreach. Outreach activities include support for mentoring and tutoring in the South Bend area schools, summer institutes for Catholic school superintendents, assistance for foundations interested in educational issues, and partnerships with teacher-service programs at other colleges and universities.

The Mendelson Center for Sport, Character and Culture encourages sport participants, sport organizations, and educational institutions to embody values and behaviors that promote social justice, such as valuing diversity, creating equal opportunity, and advocating for the disadvantaged. In recognition of the importance of sport in contemporary society, the center seeks to offer critical analyses of the relationship between sport and broader culture, exploring both the possibilities and the limitations of sport’s contributions to a more just and compassionate world.

To foster the intellectual life of IEI and the Notre Dame community, the institute holds an annual lecture series to address contemporary issues in education and an annual conference to report recent research findings on schools. IEI also sponsors workshops and symposia, initiates and coordinates research projects among faculty, supports the publication of an annual edited volume on contemporary educational research and practice, and sponsors faculty exchanges, postdoctoral fellowships, and graduate training in areas related to the institute’s mission. Thus, the primary goal is to make significant contributions toward attaining educational excellence and equity in American education.

Institute for Latino Studies

Director:
Gilberto Cárdenas, Assistant Provost and Julián Samora Professor of Latino Studies

The Institute for Latino Studies was established in 1999 to advance teaching and research on the Latino population from both interdisciplinary and comparative approaches. It is founded upon the outstanding intellectual tradition established by Julián Samora (1920–1996), an esteemed Notre Dame professor in the Department of Sociology from 1959 to 1985, and its primary aim is to further the understanding of the history, culture, literature, and sociopolitical position of Latinos in the United States.

The institute offers courses cross-listed with departments in a wide range of areas. In recognition of the strong Catholic foundation of the Latino community and the rich Catholic heritage of Notre Dame, the institute also provides academic and service programs that promote a greater awareness of Latino theological and pastoral concerns. Its Galería América@ND offers exhibitions and special programs focusing on Latino art, and the Julián Samora Library Room provides students, faculty, and visitors with a scholarly and visitor-friendly environment for study and reflection.

Notre Dame’s Institute for Latino Studies also houses the headquarters of the Inter-University Program for Latino Research, a nationwide consortium of 16 university-based Latino research centers. The goal of IUPCLR is to increase the intellectual presence of Latino scholars, enhance the capacity of Latino research centers, and expand the availability and dissemination of policy-relevant materials.

Kaneb Center for Teaching and Learning

Director:
Barbara E. Walvoord, Concurrent Professor of English

The John A. Kaneb Center for Teaching and Learning provides the means for faculty and graduate teaching assistants to hone the art of teaching that has characterized a Notre Dame education over the years. Located in DeBartolo Hall, the Kaneb Center assists faculty members to evaluate and improve their teaching as well as use new technology, and graduate students to develop teaching skills and function effectively in their teaching roles through a series of five or more TA workshops on teaching provided each semester. Graduate-student instructors, upon completion of five workshops, receive a “Striving for Excellence in Teaching” certificate.

In collaboration with departments, colleges, and other University units, the center, on request, provides analysis and critiques of classroom instruction, assistance with departmental and college planning, assistance in developing teaching techniques, and University-wide stimulation for reflection on teaching and learning.

W.M. Keck Center for Transgene Research

Director:
Francis J. Castellino, Dean of the College of Science and Kleiderer-Pezold Professor of Biochemistry

Associate Directors:
Victoria A. Ploplis, Research Associate Professor Elliott D. Rosen, Research Associate Professor

Assistant Director:
Melanie E. DeFord, Associate Professional Specialist

The W.M. Keck Center for Transgene Research employs innovative genetic technology to study human diseases that involve blood-clotting and clot-dissolving proteins, such as heart disease, atherosclerosis, and cancer. Established in 1997, the center is directed by Francis J. Castellino, dean of the College of Science and Kleiderer-Pezold Professor of Biochemistry, whose own laboratory is considered among the foremost worldwide conducting basic biochemical research on blood-clotting mechanisms. The W.M. Keck Center for Transgene
Research brings together research in transgenic manipulations with other laboratories around the world that possess special expertise in characterizing the genetically altered animals.

In establishing this very sophisticated cutting-edge technology at Notre Dame, this center hopes to better understand how certain blood-clotting and clot-dissolving proteins work in a living organism, in this case mouse models of disease. In transgene research, scientists alter genetic material in a very precise manner in an animal’s embryo, either by adding, deleting, or exchanging certain genes in the few cells of the newly formed embryo. This changes the animal in every cell in its body, for its entire life span, and the changes will be handed down to future generations.

By breeding animals with differently altered genes, Notre Dame researchers expect to get a clearer view of the complex interplay of all genes involved in particular diseases. They are attempting to determine how these coagulation proteins function in a living organism; if the cells have some backup mechanism for clotting and clot dissolving; and if there are other processes within the animal, such as inflammation, atherogenesis (production of degenerative changes in arterial walls), tumorigenesis (production of tumors), and metastasis (the spread of malignant tumors), for example, that are affected as well.

**Kellogg Institute for International Studies**

**Director:**
Scott Mainwaring, Eugene and Helen Conley Professor of Government and International Studies

**Associate Director:**
Christopher Welna, Concurrent Assistant Professor of Government and International Studies

**The Institute and Its Research Agenda**

The Helen Kellogg Institute for International Studies aims to advance investigation in comparative international studies. Named to honor the woman who donated the initial endowment for it, the institute is a research center at the University of Notre Dame.

The Kellogg Institute promotes international research by attracting faculty, students, and visitors to Notre Dame and by providing them with a supportive community of scholarship, through various activities. Each year, Kellogg brings to campus about eight residential visiting fellows from the United States and abroad. The institute also comprises some 50 Kellogg fellows, all of whom are Notre Dame faculty members, coming from 10 departments, and it awards individual support to faculty, graduate students, and undergraduates for international research or internships. In support of intellectual exchange, Kellogg schedules a twice-weekly series of speakers on international topics, as well as international conferences, topical round table discussions of world affairs, and cultural events. The institute also publishes working papers and a book series to disseminate research. Through these program activities, the Kellogg Institute fosters interdisciplinary research on contemporary political, economic, social, and religious issues.

In pursuit of academic excellence, the institute emphasizes five major themes:

1. **Democratization and the Quality of Democracy.** What are the prospects for new democracies? Research on this theme studies the founding, institutionalization, and quality of democratic political regimes, primarily in Latin America but also in Europe, Asia, and Africa. It seeks to understand conditions that enhance democratic governability, the rule of law, accountability, the expansion and consolidation of human rights, and the quality of public life.

2. **Paths to Development.** What are the opportunities for economic growth in developing countries? This theme traces the processes of national and regional economic growth in the context of a globalizing world economy, with special attention to the constraints imposed by other goals, such as social equity and the preservation or institutionalization of democratic rule. It aims to promote an interdisciplinary understanding of economic policy outcomes.

3. **Public Policies for Social Justice.** How can government policy foster social well-being? Research on this theme examines the way policies, market activities, and social change combine to affect social equity. It seeks to illuminate designs for public policies that improve equity without undermining economic growth or democracy and ways to foster innovative interfaces between government and the private sector, including business, interest groups, and nonprofit organizations.

4. **Religion and the Catholic Church.** How does religion shape public life? Dealing mainly but not exclusively with Latin America, this theme focuses on past and present trends in Catholicism and other religious traditions, on the role of religion in popular culture, and on the influence of churches and religious belief upon political, social, and cultural change.

5. **Social Movements and Organized Civil Society.** What fosters a vigorous civil society? Researchers working on this theme study the formation and activity of social groups, including women’s movements, labor unions, peasant organizations, religious communities, nongovernmental development organizations, and other grassroots associations. These studies aim to elucidate the way politics and society include or exclude groups, focusing on conceptions of citizenship, characteristics of labor markets, patterns of economic development, and types of political regimes.

The institute endeavors to promote research that is germane to major issues in the contemporary world. The institute’s research on democracy, for example, has attracted worldwide attention. Similarly, Kellogg’s research on public policies has sought to influence not only academic debates but also public policy discussions. Several past Kellogg visiting fellows have served as government ministers in Brazil and Chile. The institute has sought to attract fellows with such potential and to encourage research relevant to pressing policy questions.

Kellogg researchers place special emphasis on Latin America, reflecting both the region’s importance to the United States and Notre Dame’s long-standing ties there. When the institute began, its founding leaders recognized that Notre Dame could not initially excel across the board in international studies and focused first on Latin America, demonstrating that Kellogg could quickly establish itself as a major center for contemporary research on this region.

Despite its prominence on the institute’s research agenda, however, Latin America does not command exclusive attention. Over time, Kellogg has fostered more research on other regions of the world while it has retained the Latin American emphasis for which it is best known. Researchers at
the institute seek thematic comparisons with Europe, Asia, and Africa.

From the outset, the institute has attempted to build bridges in innovative ways between the United States and Latin America and other regions, actively seeking a balance among its participants between U.S. and foreign scholars. The institute collaborates with foreign social science centers in joint research projects and sponsors a continual interchange of ideas with scholars from Latin America and elsewhere.

**Kellogg Educational Activities for Graduate Students**

At its best, research generates activities and results that help train new generations of students to understand contemporary problems and imagine their solutions. Without awarding degrees itself, Kellogg plays an active role in support of graduate training.

The Kellogg Institute places great importance on helping academic departments at Notre Dame provide world-class graduate training in international studies for outstanding students. Toward that end, the institute fosters interaction between its fellows’ research and teaching activities and provides some direct support for graduate students on a competitive basis.

Graduate students have played an integral part in the institute’s activities and mission. The institute encourages graduate student involvement in research projects and in its seminars and lectures. Many graduate students work as teaching assistants to professors who teach undergraduate courses. Regular interaction with Kellogg fellows and visiting fellows keeps students abreast of international developments and the latest analyses.

Through its emphasis on Latin America, the institute supports field concentration on this region in economics, government, sociology, and Romance languages.

The institute also provides some direct graduate assistance. Each year, several graduate students receive Kellogg Institute Dissertation Fellowships and Seed Money grants to support various stages of field research or the writing of the doctoral dissertation. The seven winners of these competitive awards in 2000 include doctoral candidates working on topics such as the office of the ombudsman in Peru, religious nationalism in post-Communist Poland, ethnic conflict in Sri Lanka and Malaysia, and contemporary party politics in Chile.

For more information about Dissertation Fellowships and Seed Money grants for Notre Dame graduate students, please contact Academic Coordinator Jean Olson at (219) 631-6023 or jean.t.olson.39@nd.edu.

**Library and Computer Resources**

Researchers at the institute have easy access to journals, monographs, primary documents, and other holdings in Notre Dame’s nearly three-million-volume library (www.nd.edu/~ndlibs) and to other U.S. research libraries through the Kellogg Information Center (www.nd.edu/~kic), located in the Hesburgh Center. This center also maintains a small collection focused on current events, including Latin American newspapers, working papers, newsletters, and reference sources. Access to numerous electronic resources, including indices and full-text databases, is also available through the center.

**Keough Institute for Irish Studies**

**Director:** Christopher B. Fox, Professor of English

The Keough Institute was established in 1993 and is directed by Chris Fox. The Keough Professor of Irish Studies is Seamus Deane, generally acknowledged to be the world’s foremost scholar of Irish literature and culture. The institute hosts invited lectures, supports graduate studies in Irish literature and culture, and expands Notre Dame’s research capabilities in Irish studies.

Students in the graduate program in Irish studies pursue the Ph.D. in English or history. They are encouraged to study the Irish language, which is offered regularly, and there are funded opportunities to study Irish abroad through a joint program with the University of Galway.

The institute has supported a variety of speakers and major events, including a conference on the northern crisis, “Pathways to Settlement: Prospects for Peace,” held in Dublin, and “Ireland: History and Narrative,” a conference that brought to campus Nobel Prize winner Seamus Heaney and other major speakers including Declan Kiberd, author of *Inventing Ireland: Literature of the Modern Nation*. Other recent lecturers have included historian Brendan Bradshaw, initiator of the debate over revisionism in Ireland, David Lloyd, Claire Wills, Terry Eagleton, and John Hume, a major contributor to ongoing peace efforts in Northern Ireland. The institute has also hosted a commemorative lecture series on the Irish Famine and its impact on America and an international meeting on the Great Irish Rebellion of 1798. Both were cosponsored by the Irish government.

The University’s Hesburgh Library offers major resources for Irish studies, including rare special collections, among these the William B. Todd Collection of the Works of Edmund Burke, the A.A. Luce Bishop Berkeley Collection, the 1798 Irish Rebellion and Union Pamphlet Collection, the O’Neill Collection of Irish Music, the David J. Butler Collection of Irish Maps with its rare, illuminated maps dating to the 16th century, collections relating to Yeats’ Abbey Theatre and the Cuala Press, and the massive Herbert Allen-Keough Eighteenth-Century Microfilm Collection of some 200,000 18th-century books, broadsides, and other printed materials. The collection includes all editions of the works of Edmund Burke and Jonathan Swift, among others. The Notre Dame Medieval Institute also offers major Irish holdings.

The core faculty in the Irish studies program includes Seamus Deane, a member of the Royal Irish Academy, a founding director of the Field Day Theatre, the general editor of the Penguin Joyce, and the author of several books; Peter Smith, assistant professor of Irish language, who holds a Ph.D. in Celtic languages from Oxford; Peter McQuillan, assistant professor of Irish language, who holds a Ph.D. in Celtic languages and literatures from Harvard; Jim Smyth, associate professor of history, who has written extensively on 17th- and 18th-century Ireland; Susan Harris, assistant professor of Irish literature, who holds her degree from Texas; Aideen O’Leary, assistant professor of Irish history, who holds her degree from Cambridge; and Luke Gibbons, visiting professor of English. Visiting professors have included Margaret O’Callaghan of Queen’s University; Terry Eagleton of St. Catherine’s College-Oxford; John Kelly of Jesus College-Oxford; Thomas Bartlett of University College Dublin; Joseph McMinn of University of Ulster; Breandán O’Buachalla (Emeritus Professor of Irish, University College Dublin); Joseph Cleary (Ph.D., Columbia University); and
Breandán MacSuibhne (Ph.D., Carnegie Mellon University).

The Keough Institute also sponsors various publications including the book series under the general editorship of Seamus Deane, *Critical Conditions: Field Day Monographs*, published by the University of Notre Dame Press, in conjunction with Field Day. The Keough Institute is also the home of *Bullán: An Irish Studies Journal*.

**Joan B. Kroc Institute for International Peace Studies**

*Director*

R. Scott Appleby, John M. Regan Jr. Director of the Joan B. Kroc Institute for International Peace Studies

**Origin**

Established in 1986 through a generous donation from Joan B. Kroc, the Kroc Institute emerged from the need felt by faculty and students for a more imaginative and ethical response to the nuclear arms buildup and the chronic problem of war. In addition to offering an innovative undergraduate interdisciplinary minor in peace studies, the institute established one of the nation’s first graduate programs in peace studies. Inspired by the Rev. Theodore M. Hesburgh, C.S.C., then president of the University, the program attracted students and visiting scholars from around the world to study peacemaking while building cross-cultural understanding among themselves. Although the end of the Cold War has led to significant changes in world affairs, concerns about collective violence, the desire to nurture international peacemakers, and support for pathbreaking peace research continue to animate the work of the institute.

**Mission**

The institute is founded on the belief that peace is inseparable from the resolution of violent conflicts and the promotion of social justice and equitable development. This comprehensive understanding of peace is rooted in the Catholic social tradition, a broadly ecumenical tradition of moral wisdom that stresses the necessity for justice in bringing about peace.

The institute’s mission embraces both the prevention of violence or war, sometimes called “negative peace,” and the building of cooperative, just relations between people, or “positive peace.” Among the many college and university programs in peace and conflict studies, the Kroc Institute is a leader in addressing the political, cultural, religious, social, and economic factors that lay the foundation for positive peace.

The institute pursues its mission through innovative, interdisciplinary educational programs on the graduate and undergraduate levels. To foster research on peace, the institute sponsors visiting fellows, working groups, conferences, and guest lectures by scholars, policymakers, and peace practitioners. The institute publishes a semiannual newsletter (the *Report*), a series of occasional papers, and policy briefs on current issues.

**Themes**

The Kroc Institute’s educational and research programs are organized around four themes:

1. The role of international norms and institutions in peacemaking. Institute faculty and students search for ways (a) to make intergovernmental organizations and other international institutions more effective and representative and (b) to increase compliance with fundamental norms of peace and human rights.

2. The impact of religious, philosophical, and cultural influences on peace. Through teaching and research, the institute explores the ethics of the use of force, the ways in which the world’s religious traditions foment violence or encourage peace, the practice of nonviolence, the importance of philosophies of global justice, and the ingredients of cultures of peace.

3. The dynamics of intergroup conflict and conflict transformation. Students and faculty explore multidisciplinary understanding of the conditions that give rise to violent conflicts in order to identify local and international responses able to transform conflicts and encourage peacebuilding. All of the institute’s conflict studies incorporate cross-cultural examination of key issues.

4. The promotion of social, economic, and environmental justice. Students and faculty interested in social change examine the role of individuals, nongovernmental organizations, commercial enterprises, and states, in sustainable economic development and respect for human rights, and conflict transformation.

With more than 300 alumni from 70 countries around the world, the Kroc network of Notre Dame peacemakers is beginning to exert a truly uplifting influence in many local communities, in transnational civil society, and in policymaking circles. Approximately half of the institute’s graduates pursue further graduate education, either in their home countries or in doctoral or professional programs in the United States, before accepting employment in intergovernmental and nongovernmental organizations or conducting peace research and education in academic institutions at home or worldwide. Graduates have also taken leadership roles in government agencies, church-sponsored international development and humanitarian projects, research institutes, and other peacemaking efforts around the globe.

For a description of the master of arts program in peace studies, please refer to the Division of Social Sciences section of this *Bulletin*.

(www.nd.edu/~krocinst)

**Laboratory for Social Research**

*Director:*

Felicia B. LeClerc, Associate Professor of Sociology

*Associate Director:*

Kajal Mukhopadhyay, Concurrent Assistant Research Professor of Economics

*Assistant Director:*

Marlyn T. Ritchie, Associate Professional Specialist

*Consultants:*

Mary Lee, Assistant Professional Specialist,

Data Services

Ke Hai Yuan, Associate Professor of Psychology

Mitchell Sanders, Assistant Professor of Government and International Studies

The Laboratory for Social Research (LSR) is an interdisciplinary training and service facility.

*Service*

The LSR provides data-processing and test-grading services through its software and optical scanner. Additionally, services are provided in questionnaire development, programming, and consultation in all phases of research (design, sampling, analysis, and evaluation).

*Research*

The LSR offers research services to both students and faculty, including consultative services regarding the formulation of research strategies, the development and implementation of statistical procedures, the construction of research-oriented classroom learning experiences, and technical
assistance for quantitative data. The center provides access to a large number of data sets that cover a wide range of substantive topics. These data sets are acquired through the University’s membership in the interuniversity Consortium for Political and Social Research and through other outside services.

**Teaching**

The LSR is the departmental center for the arts and letters second major in computer applications. This 25-hour major gives students basic knowledge and practical experience with both mainframe and microcomputer programming. Our faculty also teach advanced quantitative methods classes in the economics, government, psychology, and sociology departments as well as an interdisciplinary training course for first year graduate students. The LSR also provides undergraduate and graduate assistant in using SPSS, SAS, Systat, Stata, etc.

The facilities of LSR are located on the ninth floor of Flanner Hall.

**Medieval Institute**

**Director:**
Thomas F.X. Noble, Robert M. Conway

**Director of the Medieval Institute and Professor of History**

The Medieval Institute, established in 1946 and located on the seventh floor of the Hesburgh Library, is a center of research and advanced instruction in the civilization of the Middle Ages, with particular strengths in religious and intellectual history, Mediterranean civilization, Old and Middle English, Medieval Latin, theology and philosophy, Dante studies, medieval musicology, and liturgy. The graduate studies curriculum combines programmatic interdisciplinary course work, training in the technical skills of medieval studies, and linguistic preparation.

The institute’s library contains nearly 90,000 volumes and various collections of pamphlets, reprints, and photographic materials. The reference collection contains major primary source collections, bibliographic and reference materials, catalogs, journals, and indexes.

The institute’s library has long held extensive collections relevant to the Latin culture of the Middle Ages. Holdings in the history of medieval education are unrivaled in North America. Recently, the institute has enlarged its focus to include vernacular and Latin literatures, musicology, liturgy, medieval Judaism and Islam, and art history. Microfilms of more than 3,000 medieval manuscripts from European libraries and a collection of more than 200 facsimiles of medieval seals supplement this collection. Over the years, the institute has accumulated a valuable collection of medieval manuscripts, incunabula, and other manuscripts and rare books that are preserved in the Department of Special Collections. Also found there is the John Augustus Zahm, C.S.C., Dante Collection containing early and rare editions and an extensive and valuable set of literary studies of the *Divine Comedy* from the 19th and early 20th centuries.

What sets Notre Dame’s institute apart is its convenient gathering in one place of most of the printed materials essential to medieval studies. The Reading Room holds major dictionaries, bibliographical guides, reference works, and primary source collections. The Astrik L. Gabriel Universities Collection in a separate room offers remarkable resources, both published and unpublished, about the history of medieval universities. Another room, equipped with faculty and study carrels, holds a large collection of manuscript catalogs and materials pertinent to paleography, diplomatics, and early printed books.

Research in the institute is also supported by the University’s Milton V. Anastos Collection in Byzantine Studies, which has extraordinary holdings in the intellectual history of the Byzantine Empire.

The Frank M. Folsom Ambrosiana Microfilm and Photographic Collection consists of positive and negative microfilms of the 12,000 medieval and Renaissance manuscripts held in the Biblioteca Ambrosiana in Milan. The collection also contains about 50,000 photographs and negatives of miniatures and illuminated initials from the manuscripts, supplemented by some 15,000 color slides. The Mary Davis Drawings Collection contains photographs, negatives, and color slides of the 8,000 drawings in the Ambrosiana. The institute purchases all volumes related to the Ambrosiana materials and maintains a bibliography of all citations to Ambrosiana manuscripts.

The institute sponsors conferences, colloquia, and research seminars. Each year, there are many guest lectures and several compact seminars.

For a description of the Master of Medieval Studies and Doctor of Philosophy programs in medieval studies, please refer to the Division of Humanities section of this Bulletin.

**Nanovic Institute for European Studies**

**Director:**
J. Robert Wegs, Professor of History

Founded in 1993, the Robert and Elizabeth Nanovic Institute for European Studies enriches scholarly and intellectual life for those at the University of Notre Dame interested in European affairs. By nature interdisciplinary, European studies provides a structured way to bring together knowledge, resources, and methodologies that have traditionally been divided among academic departments.

European studies reflect the crucial place of Europe in the world. Many of the developments, ideas, and ideologies that have shaped the last five centuries have had roots in Europe: imperialism and anti-imperialism, democracy and Christian democracy, socialism, nationalism, industrialization, the world wars, post-modernism. But Europe is not just the Old World; it is also a World of the New. It is impossible to understand the present without taking account of Europe, European power, and the dramatic changes occurring on the European subcontinent. The European Union represents an innovative challenge to old political assumptions about nations and states. It also has propelled Europe into a leading role among states. Dramatically new possibilities inhere in Europe’s growing social and cultural diversity; Europe’s economic dynamism and complex role in international relations are part of the contemporary world for which we seek to prepare our students. Europe today reveals powerful tensions between the old and the new, between core and periphery. Developments in the new Europe—including societies on the outside as well as those on the inside of the process of integration—will continue to have important repercussions all over the world.

Through lectures, symposia, scholarly exchanges, visiting scholars, conferences, film series, and research grants, the institute provides both faculty and students with
opportunities to grow intellectually through the study of significant questions. The institute supports the visiting Italian Fulbright scholar and the Warsaw Scholar Program, and began its own visiting scholar program in the 1998–99 school year. In 2001–02, the number of Nanovic visiting scholars will be increased to three.

Recent issues discussed in Nanovic lectures highlight the international dimension of our activities: nationalism, citizenship, ethnicity, immigration, religion and politics, and the place of Europe in international processes. Conferences devoted to German unification (1992), the European Union (1996), the immigrant question in Europe (1998), and Christian Democracy (1999) have brought faculty from Europe and the United States together in a mutually stimulating environment for Notre Dame faculty and students.

Through research grants to faculty, graduate students, and undergraduates, the institute has made European research much more possible for the Notre Dame community. Beginning with a few faculty travel grants in 1993, the institute expanded to four undergraduate, three graduate, and three faculty grants in the 1999–2000 school year. Also added was a full-year graduate fellowship beginning in the year 2000. Further information can be obtained in the office of the Nanovic Institute, 419 Flanner Hall, telephone (219) 631–5253.

Radiation Laboratory

Director: Dan Meisel, Professor of Chemistry and Biochemistry

The Radiation Laboratory is a University institute and a government-owned facility of the U.S. Department of Energy, a member of the network of National Laboratories spread across the country. The mission of the laboratory is to study chemical reactions initiated by light or ionizing radiation. Such studies provide the fundamental underpinnings for energy science and technology development in areas such as solar energy conversion and environmental management. Because of its broad applicability, research in the laboratory is frequently the subject of interdisciplinary projects involving faculty and students in various areas of science and engineering. The Radiation Laboratory’s research programs are principally conducted by members of the University’s faculty aided by students of all levels, postdoctoral fellows, and visiting scholars from around the world. Several members of the laboratory faculty are also professors in academic departments. Scientists at the Rad Lab conduct research in collaboration with faculty members. Graduate students are accepted as members of the laboratory on recommendation by their faculty and Radiation Laboratory research advisers. Graduate students frequently are supported financially by Radiation Laboratory research fellowships during the development of their doctoral dissertations. The Radiation Laboratory operates from its own building that houses many special facilities developed for the study of the effects of light and radiation. Three electron accelerators are housed in underground vaults adjacent to the main laboratory building. These accelerators include: a) An eight-million-electron-volt (MeV) linear accelerator used to study chemical and physical processes occurring at nanosecond or longer times, b) a two-MeV Van de Graaff accelerator used in studies of Raman spectroscopy of short-lived radicals and electronically excited molecules and, c) a three-MeV Van de Graaff dedicated to studies of electron spin resonance of intermediates produced during radiation chemical processes. In addition, the laboratory has three cobalt sources ($^{60}$Co) for irradiation rated at twenty-four, six, and one kilocuries.

Studies with visible and ultraviolet light are being carried out using many different types of optical sources. These include several nitrogen lasers, dye lasers, excimer lasers, and high-intensity YAG lasers capable of producing light pulses as short as $10^{-11}$ sec, for irradiation in the visible and ultraviolet regions. Facilities are available for study of radiation processes at high pressures and very low temperatures. Analytical facilities include various types of spectrophotometers, electron-spin-resonance spectrometers, a Raman spectograph for time resolved studies, spectrophotometer and fluorescence lifetime apparatus, gas and liquid chromatographs, capillary electrophoresis, an ion chromatograph, a mass spectrometer, a differential scanning calorimeter, a Fourier-transform infrared spectrometer, light-scattering and electrochemical apparatus, and other similar types of equipment. State-of-the-art Atomic Force Microscope operates in the laboratory to characterize materials on the nanometer scale and near-field-scanning microscopy capabilities are currently under development. Computer facilities support research programs in theoretical chemistry and kinetic modeling. The laboratory operates its own glass, electronics, graphics, and machine shops.

The Radiation Laboratory is home to the Radiation Chemistry Data Center, which provides the international scientific, engineering, and industrial communities with bibliographic and numeric databases on topics of importance to the fundamentals of energy generation and environmental management.

John J. Reilly Center for Science, Technology, and Values

Director: Vaughn McKim, Associate Professor of Philosophy

The University’s John J. Reilly Center for Science, Technology, and Values was established in 1985. It is named for the father of an alumnus whose gift created the initial endowment for the center. The center’s first academic initiative, an undergraduate minor Program in Science, Technology, and Values, was launched in 1986 with the aid of a three-year start-up grant from the National Endowment for the Humanities.

The center is committed to advancing the understanding of (a) science and technology as human, knowledge-producing endeavors, and (b) the variety of ways these rapidly changing institutions impact upon and are affected by society at large.

In keeping with the University’s mission as a preeminent Catholic university, the center seeks to make a distinctive contribution to the humanistic understanding of science and technology. It supports outstanding scholarship in the fields of science and technology studies. And through conferences and publications emphasizing the complementary roles of scientific, technological, ethical, and theological perspectives, it facilitates broad public dissemination of outstanding work reflecting these viewpoints. Within the Notre Dame community as well, the center endeavors to foster a greater awareness of the significance and complexity of interactions among science, technology, and society.

Activities pursued by the center fall under the headings of academic programs and research (including support of conferences and publications).
Academic Programs

The Reilly Center provides administrative support and a campus “home base” for three very different educational programs:

The Graduate Program in History and Philosophy of Science (HPS), established in 1989, offers courses of study leading to both the M.A. and Ph.D. degrees. It provides advanced training primarily for students interested in a career of teaching and scholarship at the college and university level. The program relies on the expertise of 22 faculty representing seven University departments, making it one of the larger research groups in this field in the United States.

The undergraduate Minor Program in Science, Technology, and Values (STV) is available to all undergraduates at the University regardless of their major field of study. This 15-credit-hour program permits students in any of the University’s colleges to take a coherent cluster of cross-listed STV courses organized around such themes as Technology and Public Policy; History and Philosophy of Medicine; Science and Religion; Environmental Science and Ethics; Biotechnology and Society; and Medical Ethics. Currently nearly 30 faculty from different colleges of the University offer cross-listed courses in the program. The STV program maintains close relationships with Notre Dame’s Center for Environmental Science and Technology and is involved in the ongoing development of collaborative instructional programs at the Biosphere in Arizona, where Notre Dame students have the opportunity to study environmental problems in this unique facility.

The Five-Year, Double Degree Program in Arts and Letters/Engineering enables students to earn two undergraduate degrees in ten semesters of course work. It provides a select group of students with the opportunity to combine the value of a liberal arts education with their professional training in engineering. To encourage students to take advantage of the Five-year Program, a scholarship fund administered jointly by the center and the financial aid office has been established. It provides some scholarship support for financially needy juniors and seniors enrolled in the program, as well as substantial financial assistance for those in their fifth, and final, year of study. The most outstanding members of each fifth-year class receive the designation of Reilly Scholar, and are recognized for their achievements at graduation.

Research: Conferences, Lectures, and Publications

The center regularly brings to campus distinguished speakers to lecture on topics relevant to the interests of students and faculty involved in all of its academic programs. This includes a major speaker series in the History and Philosophy of Science (HPS), bringing to campus eight or more well-known scholars every year. The center also sponsors activities and lectures specifically devoted to applied science and technology and to their social and ethical implications. Issues pertaining to risk assessment, the environmental crisis, current issues in biotechnology, medical ethics, and science and religion have each been the subject of lectures or panel discussions recently, as have computer ethics and nuclear weapons control. Throughout the academic year events such as debates and films highlighting science/technology and society issues have been sponsored by the center for the entire academic community.

On a regular basis, the center also sponsors major academic conferences on campus, involving 50 to 75 scholars, to explore in depth a particular topic in science studies.

Over the past nine years, the Reilly Center and HPS Program have cosponsored six major research conferences. “Natural Images in Economics,” a conference on the roles of physics and biology as providers of models for theory construction in economics, was held in September 1991. In March 1992, a conference “Neurobiology and Narrative: Explanation in Neurobiology, Psychiatry and Psychology” brought together a distinguished group of scholars in cognitive science with philosophers and historians of the human sciences.

In April 1993, a major conference on science and religion was cosponsored with Notre Dame’s Center for Philosophy of Religion. “Causality in Crisis? Statistical Methods and the Search for Causal Knowledge in the Social Sciences” provided the theme for a conference held in October 1993 at which prominent social science methodologists and philosophers of science debated the significance of recent advances in statistical methodology. In the fall of 1995, the center was cosponsor of a major international conference, “Controlling Our Destinies,” on the ethical, legal, historical, and philosophical implications of the Human Genome Project. This was followed in the spring of 1997 by a cosponsored conference, “The Need for a New Economics of Science,” examining the changing economic relations of science and funded research.

In addition, smaller “mini-conferences” are sponsored on an occasional basis. The center has hosted the international meeting of the History of Astronomy Working Group at Notre Dame on three occasions, and sponsored the mini-conference “Dissent and Orthodoxy in Quantum Mechanics” in the fall of 1997. In the spring of 1998 it hosted the second meeting of the International Working Group in the History of Philosophy of Science (HOPOS). Proceedings of major conferences are made available as volumes in the series, Studies in Science and the Humanities from the Reilly Center, published through the University of Notre Dame Press.

Visiting Fellow Opportunities

The center encourages inquiries from scholars who would like to spend a period of time at the University engaged in research as visiting fellows of the center. Although the center does not supply fellowship funds for such appointments, an office, and full access to the University libraries and state-of-the-art computer support can be arranged. Visiting fellows are invited to participate in research seminars, reading groups, and all other center-sponsored activities.

The center maintains offices at 346 O’Shaughnessy Hall and is directed by Prof. Vaughn McKim (philosophy). Prof. Don Howard (philosophy) serves as director of the Graduate Program in History and Philosophy of Science, and Prof. Phillip Sloan (Program of Liberal Studies) is the director of the Science, Technology, and Values academic minor program. A Center Advisory Board, comprised of distinguished alumni, scholars, and individuals in public life, assists the center with long-range planning. A group of elected faculty fellows is responsible for oversight of all center programs.
South Bend Center for Medical Education

Acting Director:
John F. O’Malley, Ph.D., Adjunct Associate Professor of Biological Sciences

Adjunct Professors:
Kenneth R. Olson, Ph.D. (biological sciences); William C. Hamlett (biological sciences)

Adjunct Associate Professors:
Daryl D. Christ, Ph.D. (biological sciences); Edward E. McKee (biological sciences); John F. O’Malley, Ph.D. (biological sciences); Robert E. Kingsley, Ph.D. (biological sciences)

Adjunct Assistant Professors:
Nancy L. Cole, Ph.D. (biological sciences); Gary A. Fromm, M.D. (clinical) (biological sciences); Faye L. Magnesson, M.D. (clinical) (biological sciences); Diane S. Musgrave, M.D. (clinical) (biological sciences); Mark N. Walsh, M.D. (clinical) (biological sciences); Joseph A. Prahlow, M.D. (clinical) (biological sciences)

The South Bend Center for Medical Education, located in Haggar Hall, is one of eight centers for medical education in the Indiana University Medical School system. The center offers the first- and second-year program in medicine and participates in programs leading to a master’s and a doctoral degree in biomedically oriented sciences in conjunction with the Notre Dame Graduate School.

Although all students in the center’s programs are registered in the University of Notre Dame, admission to the medical program is a function of the Indiana University Medical School, and applications should be directed to its admissions office. Admission to biomedical graduate programs is a joint function of the center and the several cooperating departments of the Graduate School. Application for these programs should be made to the Office of Graduate Admissions.

At present, biomedically oriented graduate programs in which the center plays a conspicuous role are offered in the areas of human anatomy, human physiology, and neuroscience. The student’s major adviser for these programs is chosen from the center faculty, and the student’s committee is composed of faculty from the center and the appropriate graduate departments.

A unique M.D./Ph.D. program is available to outstanding students. These students are admitted simultaneously to the Indiana University School of Medicine and the University of Notre Dame Graduate School. The M.D./Ph.D. program is described in the Division of Science section of this Bulletin.

Students interested in this program should contact the Office of the Director, South Bend Center for Medical Education. Other graduate students may take courses in the center subject to approval of the course instructor, the center director, and the home department of the student, and subject to the availability of space in the desired course.

Walther Cancer Research Center

Director:
Rudolph M. Navari, M.D., Ph.D., Professional Specialist

The Walther Cancer Research Center is a collaboration between the University of Notre Dame and the Walther Cancer Institute, a private nonprofit research organization affiliated with major universities and medical institutions. The Walther Cancer Institute’s activities include a wide variety of specific areas including cell biology, biochemistry, drug design, clinical oncology, and patient care. The institute emphasizes collaboration and communication among its members in order to maximize the transfer of information between the laboratory and the clinic.

The specific objectives of the research center at the University involve four major areas of investigation: molecular biology and gene targeting program, cell biology and cell signaling program, drug design and development, and ethics in oncology.

The molecular biology and gene targeting program utilizes transgene technology to develop mice with either delayed expression or expression of mutated forms of proteins. These technologies permit the study of the relative contribution of components of the coagulation and fibrinolytic systems in various stages of cancer and methods to potentially identify new therapeutic regimens.

The cell biology and cell signaling program studies the mechanisms and regulation of cell proliferation, cell motility, angiogenesis, apoptosis, and transformation. Using a variety of cancer cell culture systems and techniques, an in vitro assessment of cell proliferation, cell death, invasion, and migration is carried out with an emphasis on the biology of breast and prostate cancer, experimental therapeutics, and hormone resistance.

The drug design and development program investigates the synthesis and the structural details of various potential chemotherapeutic agents as well as their interaction with biological receptors at the molecular level. The structural characterization is accomplished using high field nuclear magnetic resonance mass spectroscopy and X-ray crystallographic techniques.

The ethics-in-oncology program studies the doctor-patient relationship with the goal of improving communication in the areas of truth telling, confidentiality, informed consent, informed refusal, decision making, end-of-life care, clinical trials, and spirituality in medicine with specific emphasis on patients with a cancer diagnosis. Instruments, techniques, and interventions will be developed to investigate and improve the levels of knowledge of patients and physicians in these various areas.

The faculty in the Walther Cancer Center and their research interests are listed below.

Cell Biology/Cell Signaling Group
Crislyn D’Souza-Schorey, Walther Cancer Institute Assistant Professor. Membrane trafficking and cytoskeletal remodeling in relation to cell transformation and metastasis.
Frederick W. Goetz, Professor of Biological Sciences.
Holly V. Goodson, Assistant Professor of Chemistry and Biochemistry.
Paul W. Huber, Associate Professor of Biochemistry. RNA-protein interactions, localization of mRNA during development.
Alan L. Johnson, Professor of Biological Sciences. Ovarian follicle differentiation, apoptosis, ovarian cancer.
Joseph O’Tousa, Professor of Biological Sciences. Molecular components and signaling pathways underlying the execution of programmed cell death.
Morris Pollard, Coleman Professor Emeritus of Biological Sciences. Model systems for prostate cancer.
Jeff S. Schorey, Assistant Professor of Biological Sciences. Mycobacteria, bladder cancer.
Neil F. Shay, Associate Professor of Biological Sciences. Nutrition and metabolism; metabolic effects of natural plant products; interactions between dietary supplements and pharmacological treatments.

Martin P.R. Tenniswood, Coleman Professor of Biological Sciences. Identification of genes related to apoptosis and their relationships to the invasive phenotypes of tumor cells, breast and prostate cancer.

Kevin Vaughan, Assistant Professor of Biological Sciences. Dynactin and cytoplasmic dynein-mediated motility.

JoEllen Welsh, Professor of Biological Sciences. Mechanisms of inhibition of breast cancer cell growth by vitamin D analogues.

**Gene Targeting Group**

Francis J. Castellino, Kleiderer-Pezold Professor of Biochemistry, Dean. The biological role of the cancer procoagulant gene. The relationship between hemostasis and cancer.

Linda S. Gutierrez, Assistant Professional Specialist. Tumor growth and metastasis.

Victoria A. Ploplis, Research Associate Professor of Chemistry and Biochemistry. Fibrinolysis, metalloproteinases, cancer.

Elliot D. Rosen, Research Associate Professor of Chemistry and Biochemistry. Cancer procoagulant, thrombosis, cancer.

Alexis A. Schulman, Associate Professional Specialist. Angiogenesis.

**Drug Design Group**

Paul Helquist, Professor of Chemistry and Biochemistry. Synthesis, structural characterization, and biological mechanisms of action of new antitumor drugs.

Marvin J. Miller, George and Winifred Clark Professor of Chemistry and Biochemistry. Synthetic bioorganic chemistry.

Bradley D. Smith, Professor of Chemistry and Biochemistry. Bioorganic chemistry, molecular recognition, membrane transport, switchable binding.

Richard E. Taylor, Associate Professor of Chemistry and Biochemistry. Conformational libraries: modulation of the biological activity of complex natural products.

Olaf Wiest, Associate Professor of Chemistry and Biochemistry. DNA mutagenesis and repair by light.

**Ethics in Oncology Group**


The School of Architecture

Chair:
   Carroll William Westfall
Director of Graduate Studies:
   Norman Crowe
Telephone: (219) 631-6137
E-mail: crowe.2@nd.edu

The Program of Studies

The School of Architecture offers a graduate program for a master of architecture degree. There are two available areas of concentration: an N.A.A.B. accredited professional degree and a postprofessional degree, both of which are four semesters in duration.

Traditional and Classical Architecture: Postprofessional Degree
This concentration is intended for students entering the University of Notre Dame with a four-year preprofessional degree in architecture and seeking a professional graduate degree. It is also open to students who hold a five-year degree and wish to study within the classical discipline.

The theoretical direction of the curriculum is rooted in a worldview based on the principles of classical architecture. The intent is to foster an orientation to design that is based on tradition, classical in spirit and form, and responsive to the exigencies of contemporary practice.

Course work begins with an intensive study of design, theory, and elements of classical architecture. The second semester is spent in residence at the University of Notre Dame’s Rome Studies Center in the centro storico, where the student engages in design, history, and theory courses focused on the Rome context. The final two semesters are spent on the Notre Dame campus. Three studios are offered, providing the student with opportunities to design in a variety of scales and contexts in which contemporary architectural issues are explored. The course of studies culminates in a thesis that synthesizes the student’s design experience.

Urban Design: Postprofessional Degree
This concentration is intended for students entering the University of Notre Dame with a professional degree in architecture.

The goal of the postprofessional degree is to develop design and critical thinking skills to address architecturally the problems confronting contemporary cities. The theoretical direction of this concentration is based on the paradigms of traditional European and American cities. The student is compelled to address design strategies based on an awareness of the complexity of scales and contexts within which the city’s historical developments unfold. The issues range from environmental concerns and the size of a city, to the city’s composition consisting of quarters, squares, streets, and blocks, to the balance of the architecture of the public and private realms.

Course work begins with an intensive study of the traditional city’s morphology and architecture. The second semester is spent in residence at the University of Notre Dame’s Rome Studies Center in the centro storico, engaging in design, urban history, and theory. Paralleling the first concentration, three studios are offered. These provide the student with opportunities to design in a variety of scales and contexts in which contemporary issues of architecture and the city are explored. The course of studies culminates in a thesis that synthesizes the student’s design experience.

Degree Requirements
Degree requirements include three course components that are applicable to both concentrations: advanced architectural design, theory classes and approved electives, and thesis preparation and direction, for a total of 39 credit hours. (Total number of credit hours for the professional degree varies, depending on the candidate’s undergraduate degree.) Advanced architectural design consists of two six-credit-hour studios. Theory classes consist of four three-credit-hour seminars. Thesis preparation and direction consists of a thesis preparation course and a six-credit-hour studio where candidates explore special areas of design and research within the framework of the program. The thesis is developed under the direction of a specific faculty member whose expertise and interests coincide with the candidate’s proposal. Approval of all thesis proposals is made by the graduate studies committee.

In both concentrations, selection of specific courses is tailored to each candidate in response to the candidate’s interests and undergraduate experience.

Application
In addition to the Graduate School’s requirements for application, the following documents are to be submitted with the regular application material:

- Letters of Recommendation — for those applicants with practice experience in architecture, a minimum of one letter of recommendation from a registered practicing architect is required in addition to the references required by the Graduate School.
- Portfolio — all applicants must submit a portfolio of their work from academic experience, from independent projects, and/or from practice. The portfolio size should be a maximum 11 x 14 inches and should include only reproductions, not originals.

A visit to the campus and a personal interview are encouraged. The School of Architecture’s graduate studies committee conducts interviews.

Completed applications and all admission requirements except the portfolio should be directed to the Office of Graduate Admissions. Portfolios only (with self-addressed return package and sufficient return postage if return of portfolio is desired) should be directed to: University of Notre Dame, School of Architecture, 110 Bond Hall, Graduate Studies Committee, Notre Dame IN 46556-5652.

Financial Support
Candidates in the program receive financial support in the form of full tuition scholarships and stipends in the form of graduate assistantships and fellowships including the Bond-Montedonico Fellowship program,
the Joseph Z. Burgee and Joseph Z. Burgee Jr. Fellowship program, the James A. Nolen Jr. Fellowship, and the Joseph M. and Virginia L. Corasaniti Architecture Fellowship. Teaching or research requirements for students receiving stipends comprise a minimum of three out of four semesters, 15 hours per week, during the academic semester.

Further Information
For further information regarding the graduate program in the School of Architecture, please contact:

Prof. Norman Crowe
Director of Graduate Studies
School of Architecture
110 Bond Hall
University of Notre Dame
Notre Dame, IN 46556-5652
(219) 631-6137
E-mail: Crowe.2@nd.edu

Course Descriptions
Each course listing includes:
— Course Number
— Title
— (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
— Instructor
— Course Description
— (Semester normally offered)

Required Courses

643. Advanced Architectural Design I
(3-0-6) Economakis
(Fall)

644. Advanced Architectural Design II
(3-0-6) Economakis
(Rome)

645. Thesis Preparation and Design
(3-0-6) Staff
Preparatory analyses, precedents, and data required to begin design thesis. (Fall)

647. Thesis Prep II
(3-0-3) Crowe
Fundamentals of design thesis, including organization of material, research methods and procedures, and formation of theoretical argument and relationship to the design process. (Fall)

692. Roman Urbanism and Architecture II
(Rome)
(3-0-3) Staff
The urban and architectural history of Rome within the context of the social and political factors that brought it about. (Spring)

693. Architectural Theory I
(3-0-3) Westfall
This course reviews, through lectures, discussions, analysis of assigned texts, and the writing of research papers, the intersection of the religious, civil, architectural, and urban characteristics of the built world within the Western tradition. (Fall)

694. Architectural Theory II
(3-0-3) Deupi
This seminar explores the philosophical, historical, and literary background of traditional architecture by probing within the curious domain of architectural theory through a careful reading of primary sources, in their original languages and in translation, of Vitruvius, Abbot Suger, Alberti, Serlio, Palladio, Vignola, Claude Perrault, etc. (Fall)

699. Architectural Theory III
(3-0-3) Economakis
A survey of contemporary traditional architecture and urbanism, including works by Raymond Erith, Hasan Fathy, Pierre Barbe, Demetri Pipkions, Leon Krier, and Demetri Porphyrios, and concluding with the most recent events, building, and urban developments. Emphasis will be given to works that exemplify the urban, constructional, and formal principles of contemporary traditional architecture. (Spring)

696. Architectural Theory IV
(3-0-3) Younés
The purpose of this seminar is to reflect on some of the most distinctive issues in architectural theory needed by contemporary classicists. The selected topics will cover the following: the reading of history, architecture and ontology, architecture and technique, aesthetics of architecture, imitation and invention, character and style, politics and the polis, classicism and pluralism, architecture and language, and nature and the man-made. (Spring)

698A. Special Studies (Rome)
(V-V-V) Younés
The graduate studies seminar in Rome concerns topics in theory and history that pertain to Rome’s urbanism and architecture. Topics are either chosen by the student in consultation with the faculty, or assigned by the faculty. Students are encouraged to choose topics not usually covered in studio and other seminars. The requirements are a notebook and term paper. (Spring)

Faculty


ALAN DEFREES, Professor. B.S., Univ. of Notre Dame, 1974. (1996)


DINO MARCANTONIO, Assistant Professor. B.A., Univ. of Toronto, 1990; M.Arch., Univ. of Virginia, 1993. (1999)
PALOMA PAJARES, Associate Professor.

THOMAS GORDON SMITH, Professor.


DUNCAN G. STROIK, Associate Professor.


SAMIR YOUNÉS, Director of the Rome Studies Center and Associate Professor. B.Arch., Univ. of Texas, 1981; M.Arch., ibid., 1984. (1991)
The Division of Engineering

Five departments in the Division of Engineering offer program opportunities to qualified graduate students for advanced instruction and research leading to the degrees of master of science and doctor of philosophy. The graduate program strikes a balance between basic science and engineering application, theory, and experiment and scholarly achievement and professional development. The division has attracted scholars with interests encompassing a wide range of modern engineering theory and practice.

Through its program of sponsored research, the division enhances the opportunities available to its faculty and graduate students to conduct research in their areas of interest. Responding to the requirements of an increasingly complex and interrelated social context, the division has developed several interdisciplinary programs of advanced teaching and research. Some of these programs are in collaboration with faculty members of other divisions and institutes within the University, while others involve cooperative efforts with professional colleagues from outside organizations. (www.nd.edu/~engineer/graduate/grad.html)

Aerospace and Mechanical Engineering

Chair: Robert C. Nelson
Associate Chair: Steven B. Skaar
Telephone: (219) 631–5430
Fax: (219) 631–8341
E-mail: ameddept@nd.edu
(www.nd.edu/~ame)

The Program of Studies
The Department of Aerospace and Mechanical Engineering offers graduate programs of study and research leading to the degrees of master of science in aerospace engineering and master of science in mechanical engineering, as well as doctor of philosophy.

For those students seeking a master’s degree, the programs aim at proficiency and creative talent in the application of basic and engineering sciences to relevant problems in the two engineering disciplines. The doctoral program strives to prepare students for creative and productive scholarship. It is designed to suit each student’s interests and gives students the opportunity to conduct individual theoretical and/or experimental research under the supervision of the department faculty.

Students in either the master’s degree or the doctoral degree programs must satisfy departmental and University course requirements along with the residence requirement.

Every degree-seeking student is required to participate in the academic programs of the department by performing a teaching-related assignment.

Current research efforts are within the areas of aerospace sciences, mechanical systems and design, solid mechanics, and thermal and fluid sciences.

The Aerospace Sciences Program
The aerospace sciences program emphasizes both the theoretical and the experimental aspects of aeroacoustics, aero-optics, aerospace systems design, high-lift aerodynamics, low Reynolds-number aerodynamics, low speed aerodynamics, particle dynamics, flow control, transonic, supersonic and hypersonic flows, and vortex aerodynamics.

The Mechanical Systems and Design Program
Research in this program is in both the theoretical and the experimental aspects of computer-aided design and manufacturing, design for manufacturing, design optimization, dynamic and control systems, mechanism and machine theory, robotics, and tribology.

The Solid Mechanics Program
Research in this program area focuses on the theoretical, experimental, and computational aspects of: coupled field phenomena in continuum mechanics, cyclic plasticity, damage mechanics, dynamic deformation and fracture, fatigue crack initiation, fracture analysis of aircraft structures, high temperature fatigue of engineering alloys, inelastic buckling, interface fracture mechanics, modeling of composite and fused deposition polymeric materials, and structural stability.

The Thermal and Fluid Sciences Program
Experimental and theoretical research in this program is conducted in boundary layer phenomena, chaos in fluid systems, computational fluid mechanics, detonation theory, droplet sprays, fire research, fluid-structure interaction, flow control, food processing technology, hydronics, hydrodynamic stability, industrial energy conservation, microfluid mechanics, molecular dynamics, multiphase and buoyant flows, reacting flows, turbulent flows, and solidification of liquid metals.

In cooperation with the Department of Civil Engineering and Geological Sciences, the Department of Aerospace and Mechanical Engineering offers an interdisciplinary program of study and research in the areas of solid, continuum, structural mechanics, and biomechanics. Courses in these subject areas listed by each department are cross-listed and are offered jointly.

Course Descriptions
Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
- Instructor
- Course Description
- (Semester normally offered)
520. Introduction to Aeroelasticity  
(3-0-3) Batill  
_Prerequisite:_ Consent of instructor.  
Aerodynamic loadings, steady state aeroelastic problems, flutter analysis under various flow conditions, analytical methods in aeroelasticity demonstrated by selected problems. (As needed)

521. Numerical Methods  
(3-0-3) Paolucci  
Interpolation, differentiation, integration, initial value and boundary value problems for ordinary differential equations, solution methods for parabolic, hyperbolic, and elliptic partial differential equations; applications to classical and current research problems in engineering and science. (Every fall)

530. Physical Gas Dynamics  
(3-0-3) Jumper  
An introduction to quantum mechanics, internal structure, and quantum energy states of monatomic and diatomic gases. Application to chemical reactions, dissociating gases, and ionized gases. High temperature properties of air. (Alternate spring semesters)

538. Intermediate Fluid Mechanics  
(3-0-3) Atassi, Powers, Sen  
_Prerequisite:_ Elementary fluid mechanics, differential equations.  
Derivation of governing equations of mass, momentum, and energy for a viscous, compressible fluid; general survey of vortex dynamics, potential flow, viscous flow, and compressible flow. (Every fall)

541. Advanced Kinematics  
(3-0-3) Stanisic  
An in-depth study of the curvature theory of planar one and two degree-of-freedom motions. Applications to synthesis of mechanisms and control of manipulators. Introduction to spatial kinematics and screw theory. (Every spring)

542. Advanced Mechanical Behavior of Materials  
(3-0-3) Staff  
_Prerequisite:_ Consent of instructor.  
Description of the mechanical behavior of metals, polymers, composites, ceramics, and glass, and characterization of the relationships between macroscopic deformation and fracture behavior of solids and meso/micro- and atomic-level mechanisms and models.

544. Optimum Design of Mechanical Elements  
(3-0-3) Renaud  
Introduction to basic optimization techniques for mechanical design problems. Current applications. (Every spring)

545. Intermediate Heat Transfer  
(3-0-3) Staff  
Fundamentals of heat convection and radiation, scalings and heat transfer analysis in external and internal flows, turbulent heat transfer, thermal radiation properties of ideal and real surfaces, radiative transfer in black and gray enclosures, introduction to radiative transfer with participating media. (Every spring)

550. Advanced Control Systems  
(3-0-3) Goodwine, Skaar  
_Prerequisite:_ ME 437.  
The application of techniques such as the phase-plane method, Lyapunov method, vector-format method, the z-transform method, and statistical methods to the design of control systems. (Alternate years)

551. Advanced Vehicle Dynamics  
(3-0-3) Nelson  
_Prerequisite:_ AERO 444 or ME 335, ME 437 or equivalent.  
The equations of motion of a rigid airplane are developed and analyzed. The relationship between aerodynamic stability derivatives, vehicle motion, and handling qualities is presented. Also classical and modern control theory is applied to the design of automatic flight control systems. (Alternate years)

552. Mathematical Theory of Robotic Manipulation  
(3-0-3) Goodwine  
_Prerequisite:_ AME 469 or equivalent.  
Homogeneous representation of rigid motion in \( \mathbb{R}^3 \), exponential coordinate for rigid motions, twists and screws, spatial and body velocities, and adjoint representation for coordinate transformations. Manipulator kinematics via the product of exponentials formulation, inverse kinematics, Jacobians, singularities, and manipulability. Multifingered hand kinematics including contact models, the grasp map, force closure, grasp planning, grasp constraints, and rolling contact kinematics.

553. Introduction to Acoustics and Noise  
(2-2-3) Atassi, Brach  
_Prerequisite:_ Consent of instructor.  
A course that treats the fundamentals of sound and noise production, transmission, and measurement. Theoretical, experimental, environmental, and legislative topics. (Alternate years)

554. Analytical Dynamics  
(3-0-3) Skaar  
Fundamental principles and analytical methods in dynamics with applications to machine design, robot analysis, and spacecraft control. (Every spring)

558. Elasticity  
(3-0-3) Mason  
The fundamental theories and techniques in elasticity are covered. Variational methods and complex variable techniques are included, and applications are demonstrated by selected problems. (Every spring)

559. Advanced Mechanics of Solids  
(3-0-3) Staff  
The course covers fundamental principles and techniques in stress analysis of trusses, beams, rigid frame, and thin-walled structures. Emphasis is placed on energy methods associated with calculus of variations. (Every fall)

560. Finite Element Methods in Structural Mechanics  
(3-0-3) Staff  
_Prerequisite:_ Consent of instructor.  
Finite element methods for static and dynamic analysis of structural and continuum systems. Displacement approach for two- and three-dimensional solids along with beams, plates, and shells. Material and geometric nonlinearities. (As needed)

561. Mathematical Methods I  
(3-0-3) Atassi, Powers, Sen  
_Prerequisite:_ Consent of instructor.  
Multidimensional calculus, linear analysis, linear operators, vector algebra, ordinary differential equations. (Every fall)

562. Mathematical Methods II  
(3-0-3) Atassi  
Continuation of AME 561. Partial differential equations, characteristics, separation of variables, similarity and transform solutions, complex variable theory, singular integral equations, integral transforms. (Every spring)

563. Finite Elements in Engineering  
(3-0-3) Staff  
_Prerequisite:_ Consent of instructor.  
Fundamental aspects of the finite element method are developed and applied to the
solution of PDEs encountered in science and engineering. Solution strategies for parabolic, elliptic, and hyperbolic equations are explored. (Spring)

565. Tribology
(3-0-3) Schmid
Fundamentals of the nature of surface contact. Regimes of fluid film lubrication, friction and wear models, and surface characteristics are analyzed and applied to machine elements and manufacturing processes. (As needed)

569. Structural Dynamics
(3-0-3) Staff
Prerequisite: Consent of instructor.
Examines problems in the vibration of continuous linear elastic structures, including strings, rods, beams, membranes, and plates; Hamilton’s principle; solution by separation of variables, integral equation and transform methods; variational methods of approximation including the finite element method; computational methods. (As needed)

570. Advanced Measurements Laboratory
(2-1-3) Corona, Dunn, F.O. Thomas
A graduate short course designed to give students laboratory experience in the use of modern measurements and the design of experiments for specific problems. (Every fall)

598. Advanced Studies
(V-V-V) Staff
Individual or small group study under the direction of a faculty member in a graduate subject not currently covered by any University course. (As needed)

598C. Vibrations
(V-V-V) Staff
Individual or small group studies under the direction of a faculty member in a graduate subject not currently covered by any University course.

598G. System Design Project
(V-V-V) Staff
Individual or small group studies under the direction of a faculty member in a graduate subject not currently covered by any University course.

599. Thesis Direction
(V-V-V) Staff
This course is reserved for the six-credit-hour thesis requirement of the research master’s degree. (Every semester)

600. Nonresident Thesis Research
(0-0-1) Staff
For master’s degree students. (As needed)

601. Viscous Flow Theory I
(3-0-3) Gad-el-Hak, Powers, Szewczyk
Prerequisite: AME 538.
Properties and solutions of the Navier-Stokes equations, high and low Reynolds number approximations for steady and unsteady flows. (Every spring)

602. Viscous Flow Theory II
(3-0-3) Gad-el-Hak, Szewczyk
Prerequisite: AME 601 or consent of instructor.
Approximate methods in solving the boundary layer equations. Properties and solutions of viscous compressible flows. Introduction to equations of motion in turbulent shear flows. (As needed)

603. Turbulence
(3-0-3) Gad-el-Hak, F.O. Thomas
Prerequisite: Consent of instructor.
Experimental facts, measurements, theory, correlations, simple approximations. Homogeneous turbulence, spectra, direct interaction, numerical models, theory of Kraichnan, meteorology, diffusion. (Alternate spring semesters)

604. Hydrodynamic Stability
(3-0-3) Szewczyk
Prerequisite: Consent of instructor.
Introduction of the major fundamental ideas, methods, and results of the theory of hydrodynamic stability. Examples of major applications are presented. (Alternate fall semesters)

610. Flow Control
(3-0-3) Gad-el-Hak
Prerequisite: AME 538
Passive, active, and reactive flow management strategies to achieve transition delay/advance, separation control, mixing augmentation, drag reduction, lift enhancement, and noise suppression. Unified framework for flow control. Futuristic reactive methods using MEMS devices, soft computing tools, and dynamical systems theory.

611. Dynamics of Compressible Fluids
(3-0-3) Dunn, Jumper, Mueller
Prerequisite: Consent of instructor.
Theoretical gas dynamics, including properties of compressible real fluids and fundamental relations for subsonic and supersonic flows. (As needed)

612. Unsteady Aerodynamics and Aeroacoustics
(3-0-3) Atassi
Prerequisite: Fluid mechanics, ideal aerodynamics.
Unsteady flows, unsteady aerodynamics of airfoils, cascades, and finite wings, acoustics in moving media, aerodynamic sound, Lighthill’s analogy, far field conditions, Kirchhoff’s method, numerical methods in aeroacoustics. (Alternate fall semesters)

620. Computational Fluid Mechanics
(3-0-3) Paolucci
Prerequisite: AME 521, AME 538
Generalized coordinate transformation, grid generation, and computational methods for inviscid flow, viscous incompressible flow, and viscous compressible flow. (Alternate years)

621. Thermal Radiation
(3-0-3) Staff
Prerequisite: Consent of instructor.

623. Thermal Convection
(3-0-3) Gad-el-Hak
Prerequisite: AME 601.
Forced convection in ducts; Graetz solution and extensions; free or forced flow boundary layer heat transfer; turbulent heat transfer; combined forced and free convection; heat transfer including phase change. (Alternate fall semesters)

641. Spatial Kinematics
(3-0-3) Stanisic
Prerequisite: Kinematic Synthesis, Linear Algebra and AME 541.
A study of the finite and instantaneous kinematics of rigid body systems including closed and open loop systems with up to five degrees-of-freedom. Position analysis via coordinate transformations. Development of Screw Theory with applications to dimensional synthesis of mechanisms and path tracking control of manipulators.

650. Advanced Topics in Solid Mechanics
(3-0-3) Corona, Mason
Prerequisite: Consent of instructor.
Topics in solid mechanics normally not covered in elementary graduate courses. Topics covered may vary. (As needed)
651. Fracture of Materials  
(3-0-3) Staff  
Prerequisite: AME 559 or equivalent.  
Concepts of fracture of brittle and ductile materials. Methods for determination of stress intensity factors, crack open displacements, and energy release rates under static and dynamic conditions. (Alternate years)

652. Mechanics of Irreversible Deformation  
(3-0-3) Corona  
Prerequisite: Linear elasticity, AME 658 and AME 559 Mechanics of Solids or consent of instructor.  
Introduction to inelastic deformation of solids. Basic concepts and applications of classical plasticity, viscoelasticity, and viscoplasticity.

653. Mechanics and Failure of Composites  
(3-0-3) Mason  
Prerequisites: AME 558 Elasticity, AME 561, and AME 562, Mathematical Methods I and II.  
An introduction to the mechanics and failure of composites. Concepts in static and dynamic anisotropic elasticity are covered as are basic concepts in viscoelasticity and hygrothermal behavior. These topics lead into a discussion of laminate theory, failure theories, shear lag theory, and micro-mechanics of composites.

654. Geometric Nonlinear Control Theory  
(3-0-3) Goodwine  
Prerequisite: Consent of instructor.  
Review of state space linear dynamical control systems, basic Lyapunov theory, and bifurcation theory. Basic concepts and methods from differential geometry including manifolds, tangent spaces, vector fields, distributions, Frobenius’ Theorem, and matrix groups and their application to nonlinear control including I/O and full state linearization via state feedback, controllability and observability, trajectory generation for nonlinear systems, and applications to stratified systems such as legged robotic locomotion and robotic manipulation.

657. Continuum Mechanics  
(3-0-3) Staff  
Prerequisite: AME 558 or AME 538 or consent of instructor.  
Deformation and motion of continua and singular surfaces; general balance equations; stress principle; balance laws for mass, momentum, and energy; thermodynamics of continua; entropy balance; constitutive relationships; material symmetry and invariance theory; linear and nonlinear constitutive models; variational foundations; topics of special interest. (Alternate years)

666. Stability Theory of Structural Systems  
(3-0-3) Staff  
Prerequisite: AME 559 or consent of instructor.  
The general principle of stability of structural systems. Euler buckling and post-buckling behavior of discrete and continuous systems are presented. (As needed)

667. Theory of Plates and Shells  
(3-0-3) Staff  
Prerequisite: AME 559 or consent of instructor.  
Differential geometry of surface in tensor form, stress resultants and stress couples, equations of equilibrium, principle of virtual work, Sanders-Koiter nonlinear shell theories, compatibility relations, linear shell theories, static-geometric duality, stability of shells, applications to shells of various geometries.

697. Directed Readings—Fluid Mechanics  
(V-V-V) Staff  
For specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by the department. (As needed)

698. Advanced Topics  
(V-V-V) Staff  
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by the department. (As needed)

699. Research and Dissertation  
(V-V-V) Staff  
Required for candidates for the advanced degree in the research program. (Every semester)

700. Nonresident Dissertation Research  
(0-0-1) Staff  
This course is reserved to provide the required continuing minimal registration of one credit hour per academic semester for nonresident graduate students who wish to retain their degree status. (As needed)

701. Graduate Seminar  
(2-0-0) Staff  
Required for all aerospace graduate students. Discussion of current topics in research and engineering by guest lecturers and staff members. (Every semester)

In addition to the courses listed above, 400-series courses for advanced undergraduates may be taken for graduate credit, subject to approval of the Department of Aerospace and Mechanical Engineering. For information on these courses, refer to the College of Engineering section of the Bulletin of Information, Undergraduate Programs.

Faculty
HAFIZ ATASSI, Viola D. Hank Professor.  
Engineer, Ecole Centrale de Paris; Licence, Univ. of Paris, 1963; Ph.D., ibid., 1966. (1969)

STEPHEN M. BATILL, Associate Dean and Professor.  
B.S., Univ. of Notre Dame, 1969; M.S., ibid., 1970; Ph.D., ibid., 1972. (1978)

ALAN P. BOWLING, Assistant Professor.  

RAYMOND M. BRACH, Professor.  
B.S., Illinois Institute of Technology, 1958; M.S., ibid., 1962; Ph.D., Univ. of Wisconsin, 1965. (1965)

THOMAS C. CORKE, Clark Chair and Professor.  
B.S.A.E., Univ. of Texas, Austin, 1983; M.S., ibid., 1986; Ph.D., ibid., 1990. (1991)

PATRICK F. DUNN, Director of Hessert Center for Aerospace Research and Professor.  

MOHAMED GAD-EL-HAK, Professor.  

J. WILLIAM GOODWIN, Assistant Professor.  

JAMES E. HOUGHTON, Assistant Professor Emeritus.  
B.S.E.E., Univ. of Notre Dame, 1949; M.S., ibid., 1962. (1952)

ROBERT A. HOWLAND JR., Associate Professor.  

NAI-CHIEN HUANG, Professor Emeritus.  

EDWARD W. JERGER, Professor Emeritus. B.S., Marquette Univ., 1946; M.S., Univ. of Wisconsin, 1947; Ph.D., Iowa State Univ., 1951. (1955)


FRANCIS M. KOBAYASHI, Professor Emeritus. B.S., Univ. of Notre Dame, 1947; M.S., ibid., 1948; Sc.D., ibid., 1953. (1948)

LAWRENCE H. NEE, Professor Emeritus. B.S., Utopia Univ., 1945; M.S., Univ. of Minnesota, 1947; Ph.D., ibid., 1950. (1950)

JOHN W. LUCEY, Associate Professor. B.S., Univ. of Notre Dame, 1957; S.M., Massachusetts Institute of Technology, 1963; Ph.D., ibid., 1965. (1965)

JAMES J. MASON, Associate Professor. B.S., Univ. of California, 1986; M.S., ibid., 1988; Ph.D., California Institute of Technology, 1993. (1993)

STUART T. McCOMAS, Professor Emeritus. B.S.M.E., Marquette Univ., 1956; M.S., Univ. of Minnesota, 1960; Ph.D., ibid., 1964. (1963)

THOMAS J. MUELLER, Roth-Gibson Professor of Aerospace Engineering. B.S., Illinois Institute of Technology, 1956; M.S., Univ. of Illinois, 1958; Ph.D., ibid., 1961. (1965)

VICTOR W. NEE, Professor Emeritus. B.S., National Taiwan Univ., 1957; Ph.D., Johns Hopkins Univ., 1967. (1965)

ROBERT C. NELSON, Chair and Professor. B.S., Univ. of Notre Dame, 1964; M.S., ibid., 1966; Ph.D., Pennsylvania State Univ., 1974. (1975)

GLEN NIEBUR, Assistant Professor, B.S., University of Minnesota, 1986; M.S.M.E., University of Minnesota, 1995; Ph.D., University of California at Berkeley, 2000. (2001)


JOSEPH M. POWERS, Associate Professor. B.S., Univ. of Illinois, 1983; M.S., ibid., 1985; Ph.D., ibid., 1988. (1989)


JOHN E. RENAUD, Associate Professor. B.S., Univ. of Maine, 1982; M.S., Renssela Polytechnic Institute, 1989; Ph.D., ibid., 1992. (1992)

RYAN K. ROEDER, Assistant Professor, B.S., Purdue University, 1994; Ph.D., Purdue University, 1999. (2001)


MICHAEL M. STANISIC, Associate Professor. B.S., Purdue Univ., 1980; M.S., ibid., 1982; Ph.D., ibid., 1986. (1988)

ALBIN A. SZEWCZYK, Professor. B.S.M.E., Univ. of Notre Dame, 1956; M.S.M.E., ibid., 1958; Ph.D., Univ. of Maryland, 1961. (1962)


Chemical Engineering

Chair:  
Mark J. McCready  
Director of Graduate Studies:  
Mark A. Stadtherr  
Telephone: (219) 631–5580  
E-mail: chgdept@nd.edu  
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The Program of Studies

The department offers programs leading to the degrees of master of science and doctor of philosophy. The aim of the graduate program is to prepare qualified candidates for research, development, teaching, and other professional careers in chemical engineering. Thus, the Ph.D. program is emphasized.

The objective of the doctoral program is to superimpose upon a broad education the ability to think independently in new fields, to coordinate technical ideas at an advanced level, and to make a systematic approach to the solution of new problems.

The course work is chosen in consultation with department faculty and the dissertation research adviser according to procedures outlined in A Guide to Graduate Studies in Chemical Engineering.

The master’s degree program consists of at least 15 credit hours of course work, plus 15 credit hours of thesis research and graduate seminar. For the Ph.D. degree, a minimum of 30 credit hours of course work is required, in addition to 42 credit hours of dissertation research and graduate seminar. There are required courses in the areas of thermodynamics, reaction engineering, transport phenomena, and mathematical methods.

After the second semester of residence, each Ph.D. student presents written and oral reports based on thesis research or project work. These reports, along with performance in courses, in research, and in teaching assistantship duties, constitute the comprehensive evaluation in chemical engineering. This allows the faculty to evaluate the student’s grasp of chemical engineering fundamentals and his or her ability to perform original, independent research. Students who pass the comprehensive evaluation may continue on to the Ph.D. program.

Ph.D. students generally take the oral candidacy examination before the end of the fifth semester in residence. This examination focuses on the progress achieved in thesis-related work and on the proposed future research.

The departmental faculty believes that all students seeking advanced degrees in chemical engineering should have some experience related to the instruction of others. Therefore, all first- and second-year graduate students are assigned teaching assistant duties. These duties consist of conducting recitation sections for lecture
courses, supervising laboratory courses, or grading homework.

Full-time students normally complete the Ph.D. degree requirements in about four to four-and-a-half years beyond the bachelor’s degree. Requirements for the master’s degree can normally be completed in two years of full-time study.

New graduate students in chemical engineering select their research area and director during their first semester in residence at Notre Dame. Areas of current research include catalysis and surface science; chemical reaction engineering; chemical vapor deposition; heat and mass transport in porous media; ionic liquids; enzyme encapsulation; biological photonic devices; biomolecular probes; waste minimization; environmentally conscious process design; ecological modeling; supercritical fluids; discrete-event systems; dynamical systems; fluid mechanics; gas-liquid flows; nonlinear dynamics; molecular theory of transport equilibria; bioseparations; polymer physics and rheology; molecular theory of transport processes; process dynamics and control; process simulation and optimization; applied mathematics; computational methods; parallel computing; statistical mechanics; suspension rheology; physiological dynamics; ceramics, superconductivity, and materials.

More detailed descriptions of the research interests of individual faculty members may be found in the brochure, *Chemical Engineering, University of Notre Dame*, and at the departmental Web site at www.nd.edu/~chegdept.

In addition to graduate assistantships and Peter C. Reilly Fellowships, several industrial fellowships also are available for highly qualified students.

**Course Descriptions**

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

510. Advanced Thermodynamics
(3-0-3) Strieder

*Prerequisite:* CHEG 327 or equivalent.

An advanced treatment of physical and chemical thermodynamics for engineers.

538. Introduction to Statistical Thermodynamics for Engineers
(3-0-3) Strieder

*Prerequisite:* CHEG 327 or equivalent.

Development of the fundamentals of statistical mechanics and thermodynamics. Applications to monatomic gases and solids, diatomic and polyatomic gases, chemical equilibrium, dense gases, solids, and liquids.

542. Mathematical Methods in Engineering I
(3-0-3) Hill

*Prerequisite:* Consent of instructor.

Rigorous development of tools of mathematical analysis and application of these to solve engineering problems. Topics include matrices, linear and nonlinear ordinary differential equations, special functions, and modeling. (Fall)

544. Transport Phenomena I
(3-0-3) Chang

Differential balance equations that govern transport processes are derived and used to solve problems that demonstrate the physical insight necessary to apply these equations to original situations. The emphasis in this course is on fluid mechanics. (Every year)

545. Transport Phenomena II
(3-0-3) Leighton

The differential equations that govern transport phenomena are applied to the solution of various heat and mass transfer problems.

546. Advanced Chemical Reaction Engineering
(3-0-3) Varma

*Prerequisite:* Undergraduate course in chemical reaction engineering. Analyses and mathematical modeling of chemical reactors with emphasis on heterogeneous reaction systems. (Every year)

552. Mathematical Methods in Engineering II
(3-0-3) Chang

*Prerequisite:* CHEG 542 or consent of instructor.

Continuation of 542, which covers treatment of partial differential equations, transform methods, perturbation methods, and approximation methods, including methods of weighted residuals and variational method. (Spring)

556. Polymer Engineering
(3-0-3) Hill

*Prerequisite:* Senior or graduate student standing in science or engineering.

A course for seniors and graduate students in science and engineering who are interested in applications of engineering to polymer science and technology. Topics include polymerization reactions and the structure, properties, processing, and production of polymers. (Every year)

567. Heterogeneous Catalysis
(3-0-3) Wolf

*Prerequisite:* Consent of instructor.

Introduction to solid state and surface chemistry, adsorption, reaction of gases on solid surfaces, experimental techniques in catalysis, catalyst preparation, and industrial catalytic processes.

598. Special Studies
(V-V-V) Staff

*Prerequisite:* Consent of instructor.

Individual or small group study under the direction of a faculty member in a graduate subject not concurrently covered by any University course. (Every semester)

598A. Phase Transformations in Solids
(3-0-3) McGinn

This course covers a range of common phase transformations found in a wide range of materials. Topics covered include phase diagrams, diffusion, interfaces in solids, solidification phenomena, and diffusional and diffusionless phase transformations. Nucleation, precipitate growth, ordering, and martensitic transformations are all discussed. The level is aimed at advanced undergraduate and first-year graduate students.

598C. Electrochemistry and Corrosion
(3-0-3) Miller

A study of some of the major concepts of electrochemistry and materials science that provides the student with a foundation for understanding, at a conceptual level, some of the important corrosion processes, as well as the methods of their control as practiced today in various industrial environments.

598D. Structure of Solids
(3-0-3) McGinn

This class will deal with the crystallographic structure of solids, primarily as found in metals, alloys, and ceramics. Imperfections in the arrangements of atoms will be emphasized, especially as regards their impact on properties. The study of structure through X-ray diffraction will be a recurring theme.
biological macromolecules. These macromolecules can perform many important functions, such as information transfer, catalysis, energy acquisition, transport regulation, and energy generation. This course focuses on the unique characteristics of macromolecules and how they can contribute in the area of engineering, such as in developing nanoscale devices, innovative materials, information storage devices, energy capture and storage, and many other applications.

599. Thesis Direction
(V-V-V) Staff
Research to satisfy the six credit hours required for the master’s degree.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

653. Heterogeneous Phase Equilibrium
(3-0-3) Brennecke
Prerequisite: Consent of instructor.
Applied phase equilibria. The theoretical and empirical principles for understanding complex multiphase behavior in multicomponent chemical systems are developed.

669, 679. Graduate Seminar
(1-0-1) (1-0-1) Staff
Staff members, guest speakers, and doctoral students discuss current research problems. (Every semester)

698. Special Studies in Chemical Engineering
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by department. (Every year)

Faculty

JOAN F. BRENNECHE, Professor, B.S., Univ. of Texas, 1984; M.S., Univ. of Illinois, 1987; Ph.D., ibid., 1989. (1990)


DAVID A. HILL, Associate Professor. Dottore in Ingegneria Chimica, Univ. di Napoli, Italy, 1983; Ph.D., Univ. of California, Berkeley, 1989. (1990)


JEFFREY C. KANTOR, Vice President for Graduate Studies and Research, Dean of the Graduate School, and Professor of Chemical Engineering, B.S., Univ. of Minnesota, 1976; M.A., Princeton Univ., 1977; Ph.D., ibid., 1981. (1981)

JAMES P. KOHN, Professor Emeritus. B.S., Univ. of Notre Dame, 1951; M.S., Univ. of Michigan, 1952; Ph.D., Univ. of Kansas, 1956. (1955)


EDWARD J. MAGINN, Associate Professor. B.S., Iowa State Univ., 1987; Ph.D., Univ. of California, Berkeley, 1995. (1995)
MARK J. McCREADY, Chair and Professor.


ALEX S. MOUKASIAN, Research Professor.
M.S., Moscow Physical Engineering Institute, 1980; Ph.D., Institute of Chemical Physics, USSR Academy of Sciences, 1986; D.Sc., Institute of Structural Macrokinetics, Russian Academy of Sciences, 1994. (1997)

KENNETH R. OLSON, Adjunct Professor (South Bend Center for Medical Education).

AGNES E. OSTAFIN, Assistant Professor.


ROGER A. SCHMITZ, Keating-Crawford Professor of Chemical Engineering. B.S., Univ. of Illinois, 1959; Ph.D., Univ. of Minnesota, 1962. (1979)

MARK A. STADTHERR, Director of Graduate Studies and Professor. B.Ch.E., Univ. of Minnesota, 1972; Ph.D., Univ. of Wisconsin, 1976. (1996)


ARVIND VARMA, Arthur J. Schmitt Professor of Chemical Engineering. B.S., Punjab Univ., 1966; M.S., Univ. of New Brunswick, 1968; Ph.D., Univ. of Minnesota, 1972. (1975)

EDUARDO E. WOLF, Professor. B.S., Univ. of Chile, 1969; M.S., Univ. of California, Davis, 1972; Ph.D., Univ. of California, Berkeley, 1975. (1975)

Civil Engineering and Geological Sciences

Chair:
Ahsan Kareem
Director of Graduate Studies:
Peter C. Burns
Telephone: (219) 631–5380
E-mail: cegeos@nd.edu
(www.nd.edu/~cegeos)

The Program of Studies

The graduate program in civil engineering and geological sciences provides an interdisciplinary atmosphere conducive to preparation of qualified candidates for careers in structural engineering, environmental engineering, bioengineering, and geological sciences.

Advanced study in civil engineering and geological sciences includes research and professional specialization in the following fields: biological treatment of hazardous wastes; earthquake and wind engineering; environmental chemistry; groundwater hydrology; hydraulics and water resources; structural mechanics and design; structural reliability; mantle petrology and planetary differentiation; sedimentology; environmental mineralogy; paleontology; low-temperature geochemistry; biogeochemistry.

The bioengineering program integrates principles of engineering, microbiology, chemistry, and biochemistry to address problems of fermentation engineering, biological treatment of hazardous wastes, and naturally induced genetic changes in mixed culture systems. An emphasis of study is the use of forcing functions to select for appropriate population distributions in industrial and municipal treatment facilities.

The environmental engineering program emphasizes water chemistry, hydrology, water supply, wastewater treatment, and water pollution control. Research topics include numerical modeling in surface and subsurface hydrology, and experimental methods in surface and subsurface hydrology.

The structural engineering program provides a modern, progressive curriculum that emphasizes theory and application along with classical and modern numerical solution procedures. Areas of research emphasis include civil infrastructure development, wind/wave/earthquake engineering, structural design, structural behavior, and structural reliability. Course offerings represent a cooperative interdisciplinary effort between the departments of aerospace and mechanical engineering, electrical engineering, and civil engineering and geological sciences.

The geological sciences program emphasizes environmental geology and an interdisciplinary view of global evolution. Research topics include planetary differentiation, mantle petrology, nuclear waste disposal, biogeochemistry, environmental geochemistry, environmental mineralogy, analytical geochemistry, and mass extinctions.

Students are encouraged to explore related courses in other departments to foster interdisciplinary thinking in their research and beyond.

Many synergies exist between the respective research programs; earthquake engineers and seismologists, water chemists and geochemists, groundwater hydrologists and hydrogeologists all work together to develop unique new insights to their respective research endeavors. Moreover, the department is strongly allied with the Center for Environmental Science and Technology, which involves faculty from seven science and engineering departments in basic scientific research in pollution control.

The programs of study offered by the department lead to the master of science degree and the doctor of philosophy degree. The department requires a minimum cumulative grade point average of 3.0 for graduation from its degree programs.

Although both research and nonresearch options are available to students seeking the master’s degree, the research option is the preferred and normal route. The nonresearch option is allowed only in exceptional circumstances. In the research option, 30 credit hours are required with six to 12 of these credits devoted to thesis research, depending on the program of study developed in conjunction with the department. The research option requires a completed thesis and an oral defense of that thesis. The master’s research is commonly completed by the end of the fourth semester of enrollment.

Requirements for the doctor of philosophy degree include approximately one academic year of course work (24 credits) beyond the master’s degree, approximately one year of doctoral research, and successful completion of the candidacy and dissertation examinations.
Programs of study and research are arranged to suit the specific background and interests of the individual student, with guidance and approval of the faculty of the department and in conformity with the general requirements of the Graduate School.

Regardless of funding source, all students participate in the educational mission of the department by serving as teaching assistants for eight hours per week during their first year, four hours per week during their second year, and four hours per week during one additional semester.

Students in all the graduate programs are encouraged to include courses from other departments and colleges within the University to expand their understanding of today’s complex technological-social-economic problems. In the past, students have shown particular interest in extradepartmental courses in biological sciences, chemical engineering, chemistry, economics, electrical engineering, mathematics, and mechanical engineering.

Admission to graduate study in the Department of Civil Engineering and Geological Sciences is not limited to undergraduate majors in civil engineering and/or geology. Those with undergraduate majors in other fields of engineering or the physical sciences are encouraged to apply.

**Course Descriptions**

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

**Civil Engineering**

525. Advanced Geostatistics

Prerequisite: CE 331 or consent of instructor.
Introduction to modern geostatistical techniques including principal component analysis, factor analysis, kriging, and 3-D simulation. The focus is on application to field data and analysis. Substantial computer programming required. (Every other year)

530. Environmental Chemistry

Prerequisite: Consent of instructor.
Applications of acid-base, solubility, complex formation, and oxidation reduction equilibria to water supply, wastewater treatment, and natural environmental systems. (Fall)

531. Introduction to Bioengineering

Prerequisite: Consent of instructor.
Biological systems, including those involved in the fermentation industry and biological wastewater treatment, are discussed. An introduction to microbiology and biochemistry is provided. (Fall)

534. Design of Biological Waste Treatment Systems

Prerequisite: CE 531 or consent of instructor.
In-depth discussion of biological waste treatment. Review of pilot and full-scale treatment systems from bench scale studies for both domestic and industrial wastes. Heavy emphasis on literature reviews, designs, and discussions. (Alternate spring)

539. Advanced Hydraulics

Prerequisite: CE 441 or consent of instructor.
Application of the basic principles of fluid mechanics. Study of laminar flow, turbulent flow, and dispersion processes with emphasis on conduit and open channel flow. (Fall)

544. Advanced Groundwater

Prerequisite: CE 444 or consent of instructor.
The equations of flow and transport are derived for porous media and fractured rocks. Additional topics include well test analysis, advanced transport theory, and state-of-the-art field methods. (Fall)

550. Advanced Control Systems

Prerequisite: EE 337.
The application of techniques such as the phase-plane method, Lyapunov method, vector-format method, the z-transform method, and statistical methods to the design of control systems.

554. Analytical Mechanics

Prerequisite: ME 356.
Introduction to advanced methods in analytical mechanics. A study of nonholonomic systems, stability of motion, and variation principles in classical and continuum mechanics.

557. Continuum Mechanics

Prerequisite: Consent of instructor.
Tensor analysis, general kinematics, equilibrium conditions, and thermodynamics of continuous media, constitutive equations. Extensions and applications in the theory of elasticity, fluid dynamics, thermoelasticity, viscoelasticity, and thermoviscoelasticity.

558. Elasticity

Prerequisite: Consent of instructor.
The fundamental theories and techniques in elasticity are covered. Variational methods and complex variable techniques are included, and applications are demonstrated by selected problems.

559. Advanced Mechanics of Solids

Prerequisite: Consent of instructor.
Advanced topics in mechanics of solids including elasticity, torsion, stability, energy principles, and inelastic materials.

560. Finite Elements in Structural Mechanics

Prerequisite: CE 356 or consent of instructor.
Finite element methods for static and dynamic analysis of structural and continuum systems. Analysis of two- and three-dimensional solids as well as plates and shells. Introduction to nonlinear analysis.

563. Finite Elements in Engineering

Prerequisite: CE 441 or consent of instructor.
Fundamental aspects of the finite element method are developed and applied to the solution of PDEs encountered in science and engineering. Solution strategies for parabolic, elliptic, and hyperbolic equations are explored. (Spring)

569. Structural Dynamics

Prerequisite: Consent of instructor.
Vibration of single-degree, multi-degree, and continuous linear viscoelastic systems. Dynamic analysis of structural systems in both frequency and time-domain. Also study of nonlinear and nonclassical damped systems with applications to earthquake/wind engineering. (Fall)

571. Structural Reliability and Probabilistic Bases of Design

Prerequisite: CE 331 or consent of instructor.
Identification and modeling of non-deterministic problems in the context of
573. Environmental Engineering Design
(3-0-3) Ketchum
Prerequisite: Consent of instructor.
Application of physical, chemical, and biological unit operations and processes to the functional designs of municipal water pollution control facilities. (Fall)

576. Design of Structures to Resist Natural Hazards
(3-0-3) Kareem
Prerequisite: CE 486 or consent of instructor.
Natural hazards and associated load effects on structures. Analysis of damage caused by wind storms, earthquakes, and ocean waves. Design provisions to resist damage from natural hazards. (Spring)

581. Experimental Methods in Structural Dynamics
(3-0-3) Spencer
Prerequisite: CE 569 or consent of instructor.
Experimental methods in the behavior of structures under dynamic loading. Principles of vibration measurement and digital signal processing. Modal analysis, system identification, and control. (Alternate spring)

598K. Physicochemical Processes Affecting the Treatment of Organic Compounds
(3-0-3) Talley
Prerequisites: Environmental Chemistry or equivalent upper division course.
Examination of the major physical and chemical processes affecting the fate and treatment of organic compounds in soils and sediments. The emphasis is on anthropogenic organic compounds. This course will review some concepts from physical organic chemistry, and examine the relationships between chemical structure, properties, and environmental behavior of organic compounds. Chemical processes and properties important to the fate, treatment, and biotransformation of specific organic compounds are addressed. Includes one laboratory and one case study/project.

599. Thesis Direction
(V-V-V) Staff
Research to satisfy the six credit hours required for the research master’s degree.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

661. Random Vibration of Mechanical and Structural Systems
(3-0-3) Spencer
Prerequisite: CE 569 or consent of instructor.
Random vibration analysis of linear and nonlinear systems. Analytical and simulation methods are used to determine system performance and reliability. Applications are emphasized. (Alternate spring)

663. Advanced Finite Element Methods in Structural Mechanics
(3-0-3) Kirkner
Prerequisite: CE 563 or equivalent.
Finite element methods for static and dynamic analysis of structural and continuum systems. Displacement approach for two- and three-dimensional solids along with beams, plates, and shells. Material and geometric nonlinearities.

669. Earthquake Engineering
(3-0-3) Staff
Prerequisite: CE 569 or consent of instructor.
Analysis of structures and other constructed facilities under earthquake loads. Modeling of earthquake-induced ground motion and seismic design input. Principles of earthquake-resistant design. (Alternate spring)

671. Wind Engineering
(3-0-3) Kareem
Prerequisite: CE 569 or consent of instructor.
Analysis of structural response due to wind loading. Modeling of wind-induced forces. Principles of design to resist damage due to high wind loads. (Alternate fall)

698. Special Studies
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by the department.

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident doctoral students.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

Upper-level Undergraduate Courses
In addition to the CE courses listed above, the following courses offered within the department for advanced undergraduates may be taken for graduate credit (to a total of 10 credit hours).

441. Numerical Methods in Engineering
442. Water Distribution and Wastewater Collection
443. Wastewater Disposal
444. Groundwater Hydrology
445. Introduction to Geotechnical Engineering
452. Introduction to Water Chemistry and Treatment
453. Waste Disposal Management
466. Structural Steel Design
470. Construction Management
486. Reinforced Concrete Design

Geological Sciences
503. Geochemistry
(3-0-3) Fein
Prerequisites: GEOS 347 and CHEM 321 or consent of instructor.
An introduction to chemical processes in
igneous, metamorphic, sedimentary, and aqueous systems. Topics include thermodynamics, kinetics, organic and environmental geochemistry, and geomicrobiology.

519. Surface and Subsurface Geophysics
(3-0-3) Riget
Prerequisite: GEOS 458 or equivalent.
Study of seismic waves, magnetic and electromagnetic probes, and gravitational and heat flow quantization. Special attention is given to exploration with shear waves, heat flow due to climatic fluctuations, and induced polarization for detection of contaminated soils.

528. Environmental Analysis
(3-0-3) Staff
Prerequisite: Consent of instructor.
This course focuses on analytical techniques and instrumentation used in environmental research. Topics include: sample preparation and extraction methods, potentiometry, spectroscopy (elemental and molecular), chromatography (gas, high performance, liquid, and ion), mass spectrometry, and data acquisition and analysis.

542. Surficial Processes
(2-3-3) Riget
Prerequisite: GEOS 342 or consent of instructor.
A quantitative study of natural chemical and physical processes (e.g., weathering) that produce both erosional and depositional landforms. One-day field trip is required.

545. Microbes in Fluid-Rock Systems
(3-0-3) Fein
Prerequisites: CE 430/530, GEOS 403/503 or equivalent.
This course explores current research involving the interaction between microbes and geologic systems, focusing on the ability of microbes to affect mass transport in fluid-rock systems. Readings concentrate on laboratory, field, and modeling studies of environmental and/or geologic interest.

547. Geodynamics
(3-0-3) Staff
Prerequisite: Consent of instructor.
This course applies continuum physics to geological problems, beginning with plate tectonics, progressing into the study of stress and strain in geologic strata from earth processes. Large scale problems (frictional heating on faults, flow through volcanic pipes, mantle convection) are examined by applying principles from heat transfer, faulting, and fluid mechanics.

562. ICP-MS Analytical Techniques
(2-1-3) Neal
Prerequisite: Consent of instructor.
Students are introduced to the analytical techniques of inductively coupled plasma-mass spectrometry (ICP-MS). The first half of the course covers the theory of ICP-MS as well as specialized sample introduction techniques. Three weeks are spent in the lab learning machine tuning/setup techniques, ICP-MS software, and sample preparation/calibration protocols. The last third of the course is spent conducting independent projects. Graduate students are strongly advised to make this project related to their research, and senior undergraduates are encouraged to choose a project that will help in the workplace or in graduate school.

568. Environmental Isotope Chemistry
(3-0-3) Neal
Prerequisite: Consent of instructor.
The course focuses on radioactive and stable isotopes, both natural and man-made, in the environment. Specific topics include: age dating, identification of geological reservoirs, and radioactive waste disposal.

598. Special Studies
(V-V-V) Staff
Individual or small group study under the direction of a faculty member in a graduate subject not concurrently covered by any University course.

598C. Environmental and Technological Aspects of Minerals
(3-0-3) Burns
Prerequisite: Consent of instructor.
This course explores the chemistry and structures of minerals with emphasis on environmental and technological issues. Topics of environmental significance include the disposal of spent nuclear fuel, contamination of soils with heavy metals, and the remediation of mine tailings. Emphasis will be on the mineralogy of uranium, lead, mercury, iodine, selenium, and tellurium. Technological aspects of minerals, such as the use of zeolites and clay minerals as molecular sieves and as waste containment vessels, will be addressed.

599. Thesis Direction
(V-V-V) Staff
Research to satisfy the six credit hours required for a research master’s degree.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

634. Paleocology
(3-0-3) Rigby
Prerequisite: GEOS 459 or equivalent.
This course covers pre- and postmortem ecology of ancient organisms, their depositional environments, behavior, and relationship to environmental conditions as interpreted from the rock record.

635. High-Temperature Geochemistry
(3-0-3) Neal
Prerequisites: CHEM 321, GEOS 403/503 or equivalent.
Study of magma generations and evolution from a geochemical and thermodynamic standpoint. Recognition of igneous processes will result in the formulation of petrogenetic models using actual data sets. These models will be tested using thermodynamic approaches.

698. Special Studies
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by the department.

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident doctoral students.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

Upper-level Undergraduate Courses
In addition to the geological sciences courses listed above, the following courses offered within the department for advanced undergraduates may be taken for graduate credit (to a total of 10 credit hours).

454. Marine Geology
458. Geophysics
459. Paleontology

Faculty
PETER C. BURNS, Henry J. Massman, Jr.
Associate Professor of Civil Engineering and Geological Sciences, Director of Graduate
Computing and Engineering

The Program of Studies

The graduate program in the Department of Computer Science and Engineering covers the major disciplines of computer science and computer engineering. The program is designed to prepare students for careers in these high technology areas, including university teaching and research as well as industrial or governmental research and advanced development.

To achieve this goal, the Department of Computer Science and Engineering offers programs of study and research leading to the degrees of master of science in computer science and computer engineering and the doctor of philosophy. Current research emphasizes four distinct areas: computing systems in emergent technologies, algorithms and the theory of computation, prototyping computationally demanding applications, and systems and networks software. New investigative thrusts highlighting nontraditional and interdisciplinary projects, such as e-technologies, are in the planning stages.

Some graduate students are admitted to the master’s program. This program requires a minimum of 24 credit hours of course work beyond the bachelor’s degree and a master’s thesis. A full-time student can complete these requirements in three regular academic semesters plus the summer, although the majority of students take four semesters. The student must, upon the acceptance of the thesis, successfully pass an oral thesis defense examination.

Those students who show potential for the doctoral level work may be admitted to the Ph.D. program directly but are expected to complete the master’s degree requirements first. Students who complete the master’s program may also apply for admission to the doctoral program during their final semester of master’s work. Doctoral students are normally required to accumulate a minimum of 36 credit hours of satisfactory course work beyond the bachelor’s degree, plus a dissertation.

The doctoral program normally requires four years of full-time work. The requirements include successful completion of the Ph.D. qualifying and candidacy examinations, a dissertation, and the oral dissertation defense examination. Students are encouraged to pursue course work outside the department, especially in mathematics, whenever such studies support their program in the major field.

The Ph.D. qualifying examination is both written and oral and is normally taken in the second spring semester after entering the program with a bachelor’s degree. Those admitted with a master’s degree are required to take the Ph.D. qualifying examination the first spring after entering the program. The Ph.D. candidacy requirement, which consists of a written and oral part, is administered to determine if the student has identified a viable dissertation topic. The candidacy consists of a written topic proposal followed by an oral examination. After passing the Ph.D. candidacy, which typically takes place after the completion of the formal course work, the student devotes essentially all efforts to completing his or her dissertation research. At the dissertation defense, the student defends the dissertation before an oral examining board. In recent years, students have completed the Ph.D. degree requirements in about four to five years.

Finally, both M.S. and Ph.D. candidates are required to complete a teaching apprenticeship that involves teaching duties of one semester for M.S. candidates and two semesters for Ph.D. candidates.

Research Facilities

Notre Dame’s College of Engineering maintains a cluster of 99 Sun Microsystems Inc. Ultra Sparc 30 workstations with 3D graphics.
graphics display capability. The cluster also contains 15 iMacs, several Dell OptiPlex GXPRO 180 workstations, six Hewlett-Packard SSIMX laser printers, and a Hewlett-Packard 4500N color printer, which are available to students and researchers.

The University’s computing center supports AFS file service with 20 UltraSparc Enterprise file servers. These file servers provide over four Terabytes of RAID (0+1) mirrored/striped file storage space for the campus community. The computing center also supports a cluster of IBM RS/6000s, a 16-processor IBM SP-1, an eight-processor IBM SP-2 array and two Silicon Graphics computer/servers. The campus is currently connected to the VbNNS Internet-II back-bone via a 155 million bit-per-second connection.

In addition to the cluster sponsored by the College of Engineering, the department maintains a 32-node, 64 processor Sun UltraSparc array, three eight-node UltraSparc 1 arrays, a 10-node 20-CPU Linux cluster, a two node 4 processor IBM SP-2 array, and three Compaq NT file servers. The department also provides 85 UltraSparc workstations, 25 Windows workstations, 25 Linux systems, and 12 Apple Macintosh G3/G4 systems. A research ATM network, a research Myrinet gigabit network, a wireless 802.11 network, a scanner, color printer, 20 laser printers, and a large-bed plotter are also available to students.

The System and Network Administration lab contains 85 UltraSparc workstations, 25 Windows workstations, 25 Linux systems, and 12 Apple Macintosh G3/G4 systems. A research ATM network, a research Myrinet gigabit network, a wireless 802.11 network, a scanner, color printer, 20 laser printers, and a large-bed plotter are also available to students.

A specialized College of Engineering research library holds more than 50,000 volumes. The Engineering Library augments the University’s Theodore M. Hesburgh Library, which contains more than three million volumes and receives 625 journals related to engineering. The Hesburgh Library also provides database searches and bibliographic instruction.

Course Descriptions
Each course listing includes:
— Course Number
— Title
— (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
— Instructor
— Course Description
— (Semester normally offered)

511. Complexity and Algorithms
(3-0-3) Chen
A study of theoretical foundations of computer science and a selection of important algorithm techniques. Topics include the classes of P and NP, the theory of NP-completeness, linear programming, advanced graph algorithms, parallel algorithms, approximation algorithms, and randomized algorithms. (Spring)

513. Numerical Methods and Computation
(3-0-3) Izaguirre
Introduction to analysis and implementation of numerical methods for scientific computation. Topics include computer arithmetic, solution of linear and nonlinear equations, approximation, numerical integration and differentiation, numerical solution of ordinary and partial differential equations, and applications of all of these. (Fall)

521. Computer Architecture
(3-0-3) Uhran
Classic computer architectures are considered along with standard parameters for their evaluation. Characteristics that improve performance are discussed. Various forms of parallel processing with specific implementation examples are given. (Spring)

531. Programming Languages
(3-0-3) Kogge
An introduction to modern programming concepts and computational models as embodied in a number of different classes of languages. These include (1) function-based languages such as Lisp, Scheme, SASL, ML; (2) logic-based languages such as Prolog, Parlog, Strand, OPS; and (3) object-oriented languages such as Smalltalk and C++. (Fall, even-numbered years)

532. Software Engineering
(3-0-3) Staff
A comprehensive course about the methodologies required to control the complexity involved in the development of large software systems. Students are given the opportunity to practically apply software engineering techniques taught in this course through several medium-sized programming problems and one large-scale development project. Emphasis is on the use of requirements and prototyping for design and software reliability, reuse, and development management. (Fall, odd-numbered years)

533. Object-Oriented Computing
(3-0-3) Freeh
Introduction to object-oriented computing and its application. Topics include: abstract data types, encapsulation, inheritance, classes and instances, C++ programming language, object implementation technologies, and example systems. (Spring, odd-numbered years)

542. Operating System Design
(3-0-3) Freeh
Computer operating system design for resource management, communication, and security in a multiprogramming environment. Students will create modules for an existing operating system. (Fall)

554. Computer Communication Networks
(3-0-3) Staff
The analysis of computer communication protocols. The course focuses on existing communications protocols; local area networks; routing; queuing analysis; congestion control mechanisms; and analysis of high level applications. (Spring, odd-numbered years)

563. Advanced VLSI
(3-0-3) Hu
An introduction to most aspects of large-scale, handcrafted CMOS integrated circuit design including: device fabrication; artwork rules; useful circuit building blocks; and system design and layout considerations. System design considerations will include power supply level fluctuations, high-speed clocking methods, estimating interconnection delay, and design for testability. Chip system floor planning will
also be treated in depth. All circuits and systems will be digital and will be considered in the context of CMOS technology. Homework will require the use of existing Mentor IC mask artwork software. (Spring, odd-numbered years)

571. Artificial Intelligence
(3-0-3) Schetz
This course is intended as a base for further study in the fields encompassed by artificial intelligence. The focus is on representations, strategies, and mathematical formulation with some applications. (Fall, odd-numbered years)

597. Directed Readings
(V-V-V) Staff
Topics will vary from semester to semester and will be announced in advance. Possible topics might include: computer-aided design, numerical analysis and computation, distributed computing, computational geometry, special VLSI architectures, and others of interest to students and faculty.

598. Special Studies
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by department. (Offered if necessary)

598D. Computer System Modeling
(3-0-3) Byrkeet
A survey of analytic and simulation modeling techniques for studying queues that occur in computer systems. The analytic topics include reliability models, birth-death queuing models, priority queuing models, and queuing networks. The simulation topics include simulation programming using CSIM, random number generation, and random variate generation. Projects and assignments will involve modeling computer systems at various levels of abstraction including the system level, the process level, and the hardware level.

598E. Computational Methods in Biomolecular Modeling
(3-0-3) Izaguirre
Study of algorithmic and computational issues in biomolecular modeling: multiple scale solvers for molecular dynamics, performance of several serial and parallel implementations, software engineering for scientific computing, and requirements for interactive modeling.

599. Thesis Direction
(V-V-V) Staff
Research to satisfy the six credit hours required for the master's degree. (Every semester)

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident master's degree students who are completing their theses in absentia and who wish to retain their degree status. (Every semester)

611. Parallel Algorithms
(3-0-3) Chen
Introduction to parallel computational models (e.g., PRAM, fine-grain networks, and coarse-grain networks); relationship and simulation between different models. Parallel algorithm techniques and their implementation in various models for sorting, searching, message routing, data structures, graph problems, geometric problems, the FFT and matrix operations. Layout techniques and their relationship to VLSI layout systems. Lower bound results on communication complexity. Inherently sequential problems and P-completeness. (Spring, odd-numbered years)

643. Principles of Parallel Computing
(3-0-3) Staff
A comprehensive study of the fundamentals and research frontiers of parallel computing. Topics include new computing paradigm of shared-memory, distributed-memory, data-parallel and data-flow models; techniques to improve parallelism, scheduling theory, algorithms for parallel machines, and interconnection networks. (Fall, odd-numbered years)

644. Distributed Systems
(3-0-3) Staff
Study of recent trends in the design of distributed operating systems. It examines the role of network operating systems as distinct from distributed operating systems communication, and interprocess communication issues, and questions of synchronization. Distributed naming, process management, and migration and resource allocation are also covered. Communication and security are reviewed and important experimental systems are explored. (Spring, even-numbered years)

655. Specialized Parallel Architectures
(3-0-3) Staff
A comprehensive study of the fundamental issues and recent developments of designing parallel and pipelined array processors and control/data path in the algorithmic and architectural levels. Topics include methodologies of mapping algorithms onto processor arrays, partitioning, scheduling, resource binding, algorithm transformations, and fault tolerance. (Fall, even-numbered years)

697. Directed Readings
(V-V-V) Staff
Topics will vary from semester to semester and will be announced in advance. Possible topics might include: computer-aided design, numerical analysis and computation, distributed computing, computational geometry, special VLSI architectures, and others of interest to students and faculty.

698. Special Studies
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by department. (Offered if necessary)

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident doctoral students. (Every semester)

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident doctoral students who are completing their dissertations in absentia and who wish to retain their degree status. (Every semester)

Upper-level Undergraduate Courses
The following undergraduate courses, described in the Bulletin of Information, Undergraduate Programs, may be taken for graduate credit:

411. Automata
413. Algorithms
422. Computer System Design
439. Computer Simulation
443. Compilers
444. Introduction to System Administration
456. Data Networks
458. Network Management
462. VLSI Circuit Design
466. Computer Graphics
471. Introduction to Artificial Intelligence
472. Introduction to Neural Networks
498C. High Performance Scientific Computing

Faculty


XIAOBO (SHARON) HU, Associate Professor. B.S., Tianjin Univ., 1982; M.S., Polytechnic Institute of New York, 1984; Ph.D., Purdue Univ., 1989. (1996)

JESÚS A. IZAGUIRRE, Assistant Professor. B.A., ITESM-Mexico, 1991; M.S., Univ. of Illinois at Urbana-Champaign, 1996; Ph.D., ibid., 1999. (1999)


ANDREW LUMSDAINE, Associate Professor. B.S., Massachusetts Institute of Technology, 1984; M.S., ibid., 1989; Ph.D., ibid., 1992. (1992)


MATTHIAS SCHEUTZ, Assistant Professor. M.A., Univ. of Vienna, 1989; M.S., Univ of Vienna, 1993; M.S.E.E., Vienna Univ. of Technology, 1993; M.S., Indiana Univ., 1996; Ph.D, ibid., 1996. (1999)

JOHN J. UHRAN JR., Senior Associate Dean for Academic Affairs in the College of Engineering, Professor of Computer Science and Engineering and Professor of Electrical Engineering. B.S., Manhattan College, 1957; M.S., Purdue Univ., 1963; Ph.D., ibid., 1966. (1966)


The Program of Studies

The Department of Electrical Engineering offers programs of study and research opportunities leading to the degrees of master of science in electrical engineering and doctor of philosophy. The programs are designed to prepare students for careers in industrial or governmental research and advanced development, as well as university teaching and research. Areas of specialization include communication systems, control systems, signal and image processing, solid-state integrated circuits, nano-electronics, optoelectronics, and semiconductor materials and devices.

The department offers two M.S. degree options: research option and nonresearch option, both of which require a minimum of 30 credits and which can be completed by a full-time student in three semesters. Of the 30 required credits, the research M.S. program requires a minimum of 18 course credits and a minimum of six thesis research credits; in addition, the research M.S. requires successful completion of an M.S. thesis. The nonresearch program requires that all 30 credits be course credits. All students must pass the qualifying examination at the M.S. level to be conferred an M.S.E.E. degree; this examination is normally administered at the end of the second semester.

The doctoral program normally requires four to five years of full-time work beyond the bachelor’s degree. The requirements include a minimum of 36 course credits beyond the bachelor’s degree, passing both the qualifying exam and the candidacy examination, completion of a dissertation, and passing the oral dissertation defense examination. In addition, there is a three-year residency requirement. During the course of study, students are encouraged to pursue course work outside the department whenever such studies support their program in the major field.

The qualifying examination is normally taken at the end of the second semester after entering the program and covers material the student is expected to have covered as an undergraduate and/or first year graduate student. The candidacy examination, which consists of a written dissertation proposal and an oral examination administered by an examination board, is administered to determine if the student has depth in his or her research area and has identified a viable dissertation topic. After passing the candidacy examination, which typically takes place after the completion of all formal course work, the student devotes essentially all his or her efforts to completing the dissertation research. At the oral dissertation defense, the student defends the dissertation before an examining board.

Research Facilities

Several major research laboratories exist in the department to support the study of electronic and photonic materials and devices, and the analysis and design of communication systems, control systems, and signal and image processing.

The Microelectronics Laboratory allows fabrication of ICs and devices with geometries to 0.02 microns. In cleanroom areas are a photomask generator, contact mask aligners, wafer stepper, 16 furnace tubes, plasma etcher, PECVD, RIE, RTA, and six evaporators, one of which is a six-source e-beam system. Inspection systems include a JEOL SEM and Hitachi S-4500 FESEM, prism coupler, interferometer, ellipsometer, surface profiler, and a four-point probe. Nano-lithography is accomplished by a 50 kV SEM/EBL.

Advanced measurement facilities include low-temperature equipment such as a He cryostat capable of 300 mK and magnetic field of 11T and a dilution refrigerator capable of 10 mK with fields of up to 11T. Facilities are also available for low-noise, low-signal electrical measurements.

The High-Speed Circuits and Devices Laboratory houses a state-of-the-art microwave and high-speed digital device and circuits characterization facility. Full on-wafer testing capability, including analog characterization to 50 GHz and digital testing to 12.5 Gb/s, allow for comprehensive characterization of both analog and
digital high-speed microelectronic circuits. In addition, facilities for high-speed optoelectronic characterization of detectors and photoreceiver subsystems for fiber-optics telecommunications are available. State-of-the-art microwave CAD, data collection, and data analysis facilities are also in place for rapid circuit design and characterization.

The Device and Circuit Simulation Laboratory has a cluster of state-of-the-art workstations and is linked to campus mainframe computers.

The Semiconductor Optics Lab includes a 15-watt Argon-ion laser, a tunable, modelocked Ti:sapphire laser delivering femtosecond pulses, an He-Cd laser, and He-crystals with high spatial resolution and magnetic fields up to 12 Tesla.

The Optoelectronics Lab has a 10-watt Argon-ion laser and CW Ti:sapphire laser, diode lasers, spectrometers, device processing and probe test systems, a vibration-isolated optical table, and related precision positioning and optical imaging components and hardware.

The Laboratory for Image and Signal Analysis (LISA) features a dozen state-of-the-art Sun workstations for development and analysis of digital signal, image, and video processing algorithms, equipment for the acquisition, processing, and real-time display of HDTV sequences, cameras, frame grabbers, a flat-bed scanner, several high-definition 24-bit color monitors, and specialized printers.

The Control Systems Research Laboratory is used to study real-time and computer controlled systems. The laboratory has several Sun Ultra workstations running in a real-time Unix operating system. These workstations are networked to a set of dSpace miniboxes (microcontrollers) and a network of personal computers (PCs) running QNX (a real-time version of UNIX). The dSpace miniboxes and PC network are connected to a variety of Quanser servo systems. The lab provides a flexible computing environment for the empirical study of real-time networked control systems. Research work in this laboratory has been sponsored by the Army Research Office and General Motors.

The department also operates the Structural Dynamics and Control/Earthquake Engineering Laboratory jointly with the Department of Civil Engineering and Geological Sciences. Central to the facility is a slip table capable of two-inch displacement, velocity of 35 inches/second, and acceleration of ±4gs for a 1,000-pound test load over a frequency range of 0–50 Hz.

The Communication Systems Research Laboratory has a full complement of RF measurement equipment, wide-band digitizers, and connections to roof antennas, as well as a full complement of supporting workstations.

The department has its own electronics shop run by a full-time technician, and the Solid-State Laboratories are overseen by a full-time professional specialist and a full-time technician. Another full-time professional specialist manages the department’s undergraduate laboratories.

**Course Descriptions**

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week--laboratory or tutorial hours per week--credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

**546, 546L. IC Fabrication and Laboratory**

This course introduces students to the principles of integrated circuit fabrication. Topics covered in the lectures include photolithography, impurity deposition and diffusion, oxidation, thin-film deposition, and dry etching, as well as advanced fabrication techniques such as chemical-mechanical polishing (CMP) and dual-damascene. In the laboratory, students will apply these methods to fabricate a polysilicon gate CMOS integrated circuit. The circuits fabricated, such as a sound chip playing the Notre Dame fight song, typically contain more than 5,000 transistors.

**550. Linear Systems**

(3-0-3) Antsaklis

Prerequisite: EE 354 or equivalent.


**551. Mathematical Programming**

(3-0-3) Antsaklis


**553. Advanced Digital Communications**

(3-0-3) Collins

Prerequisite: EE 563 or equivalent.

Review of the signal space approach to communication theory and the derivation of optimum receiver principles. Intersymbol interference and equalization. Modulation and coding for fading and wireless channels. Introduction to spread spectrum communication and digital cellular systems. (Spring)

**554. Computer Communication Networks**

(3-0-3) Schafer / Kenney


**555. Multivariable Control Systems**

(3-3-4) Sain

Prerequisite: EE 455 or equivalent.

Linear Quadratic Gaussian (LQG) and $H^\infty$ control methods. The principal topics include signal/system spaces, singular value loci, internal stability, robust stability/performance, bounded real lemma, small gain theorem, Riccati equations, linear fractional transformations, LQR/LQG synthesis, Kalman filter, $H^\infty$ controller and filter synthesis, and model reduction methods. (Spring)

**556. Fundamentals of Semiconductor Physics**

(3-0-3) Porod

Prerequisite: EE 476 or equivalent.

Treatment of the basic principles of solids. Topics include periodic structures, lattice waves, electron states, static and dynamic properties of solids, electron-electron interaction transport, and optical properties. (Fall)

**558. Microwave Theory**

(3-0-3) Staff

Prerequisite: EE 568.

Field theory of guided waves in linear isotropic media. Mode theory and circuit
theoretic representation. Cavity resonators. (Spring)

561. Multi-Dimensional Signal Processing (3-0-3) Bauer
An introduction to the analysis and design of systems that process multidimensional signals. Emphasis is placed on the study of m-D digital filters and m-D signals. Specific topics include m-D sampling, m-D transforms, analysis and design of FIR and IIR m-D filters, stability, quantization effects, inverse problems, etc. (Alternate spring)

563. Random Variables and Stochastic Processes (3-0-3) Sauer
Prerequisites: MATH 323 and EE 354. This is an introduction to probability, random variables, and distribution functions, including random sequences and probabilistic convergence. It also covers basic concepts of stochastic processes such as stationarity, time average and ergodicity, second order statistics, Gaussian process, Markov process, and linear systems responses to stochastic processes. (Fall)

566. Solid-State Devices (3-0-3) Snider
Prerequisite: EE 556 or equivalent.
In-depth analysis of electronic devices with an emphasis on both homojunction and heterojunction devices. Operation of p-n junctions is analyzed, along with BJTs, MOSFETs, and heterojunction devices such as HBTs and MODFETs. (Spring)

568. Electromagnetic Theory (3-0-3) Iafrete
Prerequisite: EE 348 or equivalent.
The fundamental laws of Ampere, Gauss, and Faraday leading to Maxwell’s equations. Solutions of boundary value problems in various coordinates. (Fall)

571. Statistical Signal Processing (3-0-3) Huang
Prerequisite: EE 563 or equivalent.
This course covers essential statistical concepts for signal and image processing. The topics include Bayesian estimation methods such as MMSE and MAP as well as MLE; optimality theory of estimation that includes concepts of sufficiency, consistency, and efficiency; Fisher’s information; confidence intervals and basic hypothesis testing; classical Fourier-analysis based spectral analysis methods and modern eigen-decomposition based methods such as MUSIC and ESPRIT; interference suppression for emerging communication technologies such as wireless multiuser communications. (Spring)

576. Submicron Fabrication Techniques (3-0-3) Bernstein
Prerequisite: EE 486 or equivalent. Physics of quantum devices, epitaxial growth techniques, electron optics, and electron microscopy. Also, optical, x-ray, ion-beam, and electron-beam lithography, and resist fundamentals, including spinning, exposure, development, and multilayer systems. (Alternate spring)

580. Nonlinear Control Systems (3-0-3) Sain
Prerequisite: EE 555 or equivalent. Geometric methods in the control of nonlinear systems. Manifolds, Lie algebra, distributions, and co-distributions. Local system decompositions and their relationship to controllability/observability. Specific classes of problems: feedback linearization, disturbance decoupling, input-output decoupling, Lyapunov stability theory, center manifold theory, and zero dynamics. (Alternate fall)

581. Digital Image Processing (3-0-3) Stevenson
Prerequisite: EE 563. An introduction to the manipulation and analysis of digital images, intended as a foundation for research in such fields as visual communications, medical imaging, and image analysis. Specific topics include human visual effects, filtering, compression, restoration, and reconstruction. (Alternate fall)

587. Quantum Mechanics for Electrical Engineers (3-0-3) Lent
The course focuses on those aspects of quantum theory that are of particular relevance to electrical engineering. It is intended to give seniors and first-year graduate students a working knowledge of quantum mechanics at a level sufficient to illuminate the operation of standard and advanced quantum devices. Topics include classical mechanics versus quantum mechanics, early quantum theory, Schrödinger formulation, time-dependent and time-independent Schrödinger equation, Dirac formulation, Bloch theorem, magnetic effects, open quantum systems, density matrices, and coherence vector formalism.

598. Special Studies (V-V-V) Staff
Individual or small group study under the direction of a faculty member in a graduate subject not currently covered by any University course. (Fall and spring)

598F. Analog CMOS Design (3-0-3) Seabaugh
This course covers complementary metal oxide semiconductor (CMOS) amplifier design, including frequency response, noise, feedback, stability, and compensation. Operational amplifiers, bandgap reference circuits, oscillators, and phase lock loops are analyzed. Both analytic and SPICE circuit design methods are developed.

598G. Robust Stability of Linear Systems (3-0-3) Bauer
Prerequisite: A good background in linear systems.
This course provides a graduate-level coverage of recent results in robust stability of dynamical systems under structured uncertainties. Since the content is based on various recent publications, there is no textbook required. Topics will include stability of continuous and discrete domain polynomials, continuous and discrete state space systems, and time-variant/nonlinear systems. Fundamental tools such as the principle of argument and the Hermite-Biehler Theorem will be covered early in the course.

598H. Applied Networking Theory (3-0-3) Haenggi
Networking theory and applications, with emphasis on wireless and ad hoc networks. Network calculus, Markov chains, queuing theory, flow control, media access schemes, and routing algorithms. Design philosophy of existing protocols and technologies such as Bluetooth, GSM, and 802.11. Modeling of networks and network traffic.

599. Thesis Direction (V-V-V) Staff
Research to satisfy the six credit hours required for the research master’s degree. (Fall and spring)

600. Nonresident Thesis Research (0-0-1) Staff
Required of nonresident master’s students who are completing their theses in absentia and who wish to retain their degree status. (Fall and spring)
650. Advanced Linear Systems Design
(3-0-3) Sain
Prerequisite: EE 550 or consent of instructor.
Applications of modern algebra to problems of complicated linear system design.
Quotients and state variable design; freedom and system-matrix design; tensors and multilinear design. (Alternate fall)

653. Information Theory
(3-0-3) Costello
Prerequisite: EE 563 or equivalent.
A study of Shannon’s measure of information to include: mutual information, entropy, and channel capacity; the noiseless source coding theorem; the noisy channel coding theorem; rate distortion theory and data compression; channel coding and random coding bounds. (Alternate fall)

654. Coding Theory
(3-0-3) Costello
Prerequisite: EE 563 or equivalent.
Error control coding techniques for digital transmission and storage systems. Linear block codes, cyclic codes, and Reed-Solomon codes. Convolutional codes, Viterbi decoding, MAP decoding, and sequential decoding. Block and trellis coded modulation. Concatenated coding and turbo codes. Applications to computer memories, space and satellite transmission, data modems. (Alternate fall)

655. Digital Control Systems
(3-0-3) Antsaklis
Prerequisite: EE 455 and 550 or equivalent.
Analysis and design of discrete-time and sampled-data control systems. State space descriptions and transfer function descriptions using the z-transform. Control design using classical (root-locus, Bode, Nyquist), state space, and polynomial techniques. (Alternate spring)

656. Advanced Semiconductor Theory
(3-0-3) Lent
Prerequisite: EE 556.
Treatment of quantum processes in semiconductors. Topics include the electronic structure in semiconductors, lattice scattering, impurity scattering, and radiative and nonradiative processes. (Fall)

666. Advanced Quantum Devices
(3-0-3) Ilafrate
Treatment of advanced quantum transport formalisms such as density matrix formalism, Wigner functions, and Green’s functions. Also, detailed analysis of nanostructure devices (“quantum devices”) that operate by the principles of quantum interference or wave-function engineering. These include VMTs, RTDs, optical modulators and switches utilizing the quantum-confined Stark effect or Franz-Keldysh effect, Aharonov-Bohm devices, BlochFETs, and quantum-diffraction devices. Other topics include introduction to “wave guide-electronics” and treatment of quantum fluctuation phenomena in mesoscopic devices. (Spring)

671. Detection and Estimation
(3-0-3) Liu
Prerequisite: EE 563 or equivalent.
Hypothesis testing, optimization criteria (Bayes, minimax, Neyman-Pearson, etc.), likelihood ratios, detection of known signals, matched filters, Fredholm integral equation, detection of signals with unknown parameters, sequential probability ratio test, nonparametric detection, estimation of signal parameters, MLE, optimum receivers. (Alternate fall)

675. Stochastic Control Theory
(3-0-3) Sain
Prerequisite: EE 555, 563 or equivalent.
Control in the presence of uncertainties described as random variables and processes. Topics in stochastic calculus and equations, estimation, optimization, and stability. (Alternate fall)

698. Special Studies
(V-V-V) Staff
This number is reserved for specialized and/or experimental graduate courses. Content, credit, and instructor will be announced by department. (Offered as necessary)

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident doctoral students. (Fall and spring)

700. Nonresident Dissertation Research
(0-0-1) Staff
Nonresident dissertation research. Requirements of nonresident doctoral students who are completing their dissertations in absentia and who wish to retain their degree status. (Fall and spring)

Upper-level Undergraduate Courses
Up to six credits at the 400–499 level may be applied toward the M.S. degree, and up to twelve credits at the 400–499 level may be applied to the Ph.D. The following undergraduate courses, described in the Bulletin of Information, Undergraduate Programs, are available for graduate credit:

446. IC Fabrication Laboratory
453. Communication Systems
455. Control Systems
456. Data Networks
458. Engineering Electromagnetics
464. Introduction to Neural Networks
466. Topics in Electronic Transport Theory
468. Modern Photonics
471. Digital Signal Processing
472. Analysis of A-C Power Systems
476. Electronic Properties of Materials
477. Photovoltaics
486. Analog Integrated Circuit Design
496. Digital Integrated Circuits

Faculty


WILLIAM B. BERRY, Professor. B.S.E.E., Univ. of Notre Dame, 1953; M.S.E.E., ibid., 1957; Ph.D., Purdue Univ., 1964. (1963)


PATRICK J. FAY, Assistant Professor. B.S.E.E., Univ. of Notre Dame, 1991; M.S.E.E., Univ. of Illinois at Urbana-Champaign, 1993; Ph.D., ibid., 1996. (1997)


GARABET J. GABRIEL, Associate Professor Emeritus. B.S., St. Louis Univ., 1965; M.S., Illinois Institute of Technology, 1960; Ph.D., Northwestern Univ., 1964. (1965)

MARTIN HAEENGGI, Associate Professor. M.S.E.E., Swiss Federal Institute of Technology, 1995; Ph.D., ibid., 1999 (2000)
DOUGLAS C. HALL, Associate Professor. B.S., Miami Univ., 1985; M.S., Univ. of Illinois at Urbana-Champaign, 1988; Ph.D., ibid., 1991. (1994)


JOSEPH C. HOGAN, Dean Emeritus of the College of Engineering and Professor Emeritus. B.S.E.E., Washington Univ., 1943; M.S.E.E., Univ. of Missouri, 1949; Ph.D., Univ. of Wisconsin, 1953. (1967)

YIH-FANG HUANG, Chair and Professor. B.S.E.E., National Taiwan Univ., 1976; M.S.E.E., Univ. of Notre Dame, 1979; Ph.D., Princeton Univ., 1982. (1982)


JOHN B. KENNEY, Adjunct Assistant Professor. B.S.E.E., Univ. of Notre Dame, 1982; M.S.E.E., ibid., 1983; Ph.D., ibid, 1989. (1989)

THOMAS H. KOSEL, Associate Professor. B.S., Univ. of California, 1967; M.S., ibid., 1970; Ph.D., ibid., 1975. (1978)


CRAIG S. LENT, Professor. A.B., Univ. of California, Berkeley, 1978; Ph.D., Univ. of Minnesota, 1984. (1986)


WOLFGANG POROD, Professor. M.S., Univ. of Graz, 1979; Ph.D., ibid., 1981. (1986)

MICHAEL K. SAIN, Frank M. Freimann Professor of Electrical Engineering. B.S., St. Louis Univ., 1959; M.S., ibid., 1962; Ph.D., Univ. of Illinois, 1965. (1965)


GREGORY SNIDER, Associate Professor. B.S.E.E., California State Polytechnic Univ., 1983; M.S.E.E., Univ. of California, Santa Barbara, 1987; Ph.D., ibid., 1991. (1994)

ROBERT L. STEVENSON, Associate Professor. B.E.E., Univ. of Delaware, 1986; Ph.D., Purdue Univ., 1990. (1990)

JOHN J. UHRAN JR., Senior Associate Dean for Academic Affairs in the College of Engineering, Professor of Computer Science and Engineering, and Professor of Electrical Engineering. B.S., Manhattan College, 1957; M.S., Purdue Univ., 1963; Ph.D., ibid., 1966. (1966)

Engineering and Law Dual Degree Program

The dual degree program in engineering and law is designed for law students who are interested in pursuing careers in areas such as patent, environmental, telecommunications, or similar law specialties. To be eligible for the master of engineering degree, the candidate must also be a candidate for the juris doctor degree in the Notre Dame Law School. The master’s program is not available as an individual degree program.

To be awarded both degrees, the candidate must complete a minimum of 99 credit hours, 75 in law and 24 in the engineering program. The engineering degree awarded will be the master of engineering with a concentration in one of the engineering disciplines offered in Notre Dame’s Division of Engineering. The course work of the master’s program requires the completion of 24 credit hours of engineering, mathematics, or science courses acceptable to the appropriate engineering department; six credit hours of appropriate law courses; and a master’s examination. Courses for the M.Eng. will be chosen in consultation with an adviser in the student’s engineering department. The recommended distribution of engineering courses in the Law School curriculum is one each semester during the first and third years of study and two each semester during the second year.

Admission

Admission to the program requires a separate application to each school. Admissions decisions will be made independently by the Law School and by the Graduate School.

Law School applications may be obtained from the Director of Admissions, P.O. Box 959, University of Notre Dame, Notre Dame, IN 46556-0959, telephone (219) 631–6626.

For further information about the engineering program, contact the Office of Graduate Admissions.
The Division of Humanities

The Division of Humanities offers graduate programs in most departments, extending to the doctoral level in English, history, history and philosophy of science, literature, medieval studies, philosophy, and theology. The division also offers master’s degree programs in art, creative writing, early Christian studies, music, and German and romance languages and literatures.

All of these programs are directed toward preparing students for teaching and scholarship in the special areas of the humanities. These programs share the purpose of interpreting both old and new humanistic creations and in deepening the understanding and appreciation of the meaning of these creations. Using methods as old as scholarly contemplation and as new as computer analysis, the humanistic disciplines study all that pertains to human culture and to the capacity for intellectual and moral development.

Some centers and institutes provide a framework for multidisciplinary approaches to issues in the humanities. The Medieval Institute, founded in 1947, is a comprehensive teaching and research institution dedicated to the study of European culture and history between the fifth and the fifteenth centuries. The institute also sponsors conferences, colloquia, and visiting lectures and publishes a series of monographs.

The Nanovic Institute seeks to enhance European studies at Notre Dame by providing a forum for the discussion of key issues in Europe across all fields and by stimulating faculty and student research with research grants. The institute pursues these objectives through scholarly exchanges, lectures, conferences, and seminars dealing with such problems as nationalism, citizenship, ethnicity, immigration, and the place of Europe in broader international processes.

The Erasmus Institute was founded to foster research grounded in Catholic intellectual traditions and focus on significant issues in contemporary scholarship. Its mission is not to advance study of the Church or theology as such, but rather to bring resources from two millennia of Catholic thought to bear on problems in the humanities, social sciences, and arts.

The Center for Philosophy of Religion was established in the fall of 1976 in order to promote, support, and disseminate scholarly work in philosophy of religion and Christian philosophy. The center hopes to promote work concerned with the traditional topics and questions that fall under the rubric of the philosophy of religion: the theistic proofs, the rationality of belief in God, the problem of evil, the nature of religious language, and the like.

The Notre Dame Center for Ethics and Culture is dedicated to coordinating, focusing, and amplifying the rich resources in ethics provided by Notre Dame as the world’s premier Catholic university. The center’s goal is not simply to provide another response from the academy to apparently intractable cultural debates. Rather, it proposes as an alternative an approach rooted in the Christian, Augustinian, and Thomist intellectual tradition defined by Christian, and especially Catholic, religious and social practices.

Art, Art History, and Design

Chair:
Austin Collins, C.S.C.
Director of Graduate Studies:
Richard L. Gray
Telephone: (219) 631-7602
E-mail: art@nd.edu
(www.nd.edu/~art)

The Program of Studies

The Department of Art, Art History, and Design offers the master of fine arts (M.F.A.) degree in studio art and design and the master of arts (M.A.) degree in art history. In studio art and design, the department also awards the M.A. degree, but only to students who are not accepted to degree candidacy in the M.F.A. program.

The aim of the graduate program is to educate qualified, promising students in various aspects of creative activity and art history. Studio and design students may concentrate in ceramics, design, painting, photography, printmaking, and sculpture, or in a combination of these disciplines. Art history students select from a range of course offerings to fulfill their professional interests. In addition to specific courses, graduate students may pursue an area of interest through a system of independent study with a faculty adviser and a graduate committee selected by the student. Students are expected to develop a personal direction that culminates in a professional exhibition of visual work or a research project in art history.

The Master of Fine Arts Degree

The master of fine arts degree (M.F.A.) at Notre Dame is for artists and designers with exceptional talent and strong academic skills. The program combines studio work with academic studies in art history and criticism. The College Art Association and most other professional institutions of higher education recognize the M.F.A. as the terminal degree for artists and designers. This degree has become the standard prerequisite for those who intend to teach at the college level. It is also appropriate for individuals seeking to further develop their professional careers as artists and designers.

The M.F.A. degree is a studio and research degree that requires three years or six semesters of study and 60 graduate credit hours with a B (3.0) or better average,
including nine credit hours of art history, three credit hours in ARHI 681 (Graduate Seminar) and 10 credit hours of ARST 697 (Thesis Research). Additional requirements include:

- Successful completion of ARST 595 (Teaching Methods) each year.
- Admission to the third year of the M.F.A. program (M.F.A. candidacy).
- The successful completion of a written thesis approved by the student's thesis committee.
- The completion of a thesis project, an exhibition of creative work that is approved by the entire art and design faculty.

Students who are not in residence but still in the process of finishing an M.F.A. degree must be enrolled for a minimum of one credit hour of ARST 600 (Nonresident Thesis Research) each semester.

**Admission**

Art and design majors are evaluated primarily on the basis of a portfolio of 20 slides and three letters of recommendation. All applicants must write a statement of intent indicating their goals for the M.F.A. degree and their expectations for graduate studies.

Prerequisites for admission ordinarily include the B.F.A. degree in studio art or design, including courses in art and art history. However, students of exceptional merit who have earned the B.A. or B.S. degree in studio art or design or the equivalent will be considered. All applicants must have a B (3.0) or better average in undergraduate major courses. Graduate Record Examination (GRE) scores are not required for admission.

To be considered for tuition and stipend scholarships, applications should be received by February 1.

**The Master of Arts Degree: Art History**

The M.A. in art history requires the completion of 36 credit hours of graduate study, including six credit hours of thesis research, with a B (3.0) or better average. A normal course load is from nine to 12 credit hours per semester. Students are required to take at least one course or seminar from each regular art history faculty member. The successful completion of at least one seminar in each of the four areas represented by the faculty (Ancient, Medieval, Renaissance and Baroque, and Modern) and ARHI 596 (Art History Methods) is also required. Additional requirements include:

- The successful completion of a comprehensive examination. This examination is taken at the beginning of the fall semester of the second year of study.
- The successful completion of a written thesis. The student will be expected to select a thesis topic and adviser by the end of the first year of study. The finished thesis must be read and approved by the adviser and two other readers.
- Evidence of reading ability in one foreign language, either German, French, or another language approved by the graduate adviser. Reading ability is normally demonstrated by obtaining a passing grade on the appropriate Graduate Reading Examination administered by the University. This requirement must be fulfilled during the first year of graduate study.

Students who are not in residence but still in the process of finishing an M.A. degree must be enrolled for a minimum of one credit hour of ARHI 600 (Nonresident Thesis Research) each semester.

**Admission**

Admission to the art history program is based on Graduate Record Examination scores, evaluation of undergraduate transcripts, a writing sample, and letters of recommendation. Successful applicants are normally expected to hold a B.A. in art history or its equivalent (20 to 30 credit hours in art history). Students with insufficient undergraduate art history credits may be provisionally admitted to the program with the stipulation that they make up any deficiencies before being admitted to regular candidacy. Undergraduate courses taken to rectify deficiencies will not count toward the 36-credit-hour degree requirement.

To be considered for tuition and stipend scholarships, applications should be received by February 1.

**The Master of Arts Degree: Studio Art and Design**

The nonresearch master of arts degree (M.A.) program in studio art and design is granted to M.F.A. students who either are not admitted to M.F.A. candidacy or choose to leave the M.F.A. program with an M.A. degree. The department does not regularly admit students to this program. The nonresearch M.A. degree requires 40 graduate credits, including six credit hours in art history and three credit hours in ARHI 681 (Graduate Seminar). Students who are not in residence but still in the process of finishing an M.A. degree must be enrolled for a minimum of one credit hour of ARST 600 (Nonresident Thesis Research) each semester.

**Course Descriptions**

Graduate instruction in studio and design is done primarily on an independent study basis. Students meet regularly with faculty and other graduate students for critiques and seminars. Course listings in studio and design reflect the various media areas in which a student can take credits.

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

**Studio Art Program Courses**

509S, 510S. Ceramics Studio
(0-V-V) (0-V-V) Staff
Studio projects and research in ceramics. (Every semester)

511S, 512S. Ceramic Sculpture
(0-V-V) (0-V-V) Staff
Clay is the primary medium for this advanced course in sculpture. (Every semester)

533S, 534S. Painting Studio
(0-V-V) (0-V-V) Staff
Studio projects and research in painting. (Every semester)

541S, 542S. Sculpture Studio
(0-V-V) (0-V-V) Staff
Studio projects and research in three-dimensional media. (Every semester)
545A. Sculpture/Ceramics Seminar
(0-V-1) (0-V-1) Sculpture/Ceramics Staff
A team-taught seminar/critique that brings together all the ceramics and sculpture faculty and graduate students in a weekly dialogue focusing on issues in contemporary art as they relate to student research. This course is required of all ceramic and sculpture candidates each semester leading to and including the M.F.A. thesis year.

545B. Photography Seminar
(0-V-1) (0-V-1) Photography Staff
A team-taught seminar/critique that brings together all the photography faculty and graduate students in a weekly dialogue focusing on issues in contemporary art as they relate to student research. This course is required of all photography candidates each semester leading to and including the M.F.A. thesis year.

545C. Painting/Printmaking Seminar
(0-V-1) (0-V-1) Painting/Printmaking Staff
A team-taught seminar/critique that brings together all the painting and printmaking faculty and graduate students in a weekly dialogue focusing on issues in contemporary art as they relate to student research. This course is required of all painting and printmaking candidates each semester leading to and including the M.F.A. thesis year.

583S, 586S. Photography Studio
(0-V-V) (0-V-V) Staff
Studio projects and research in photography. (Every semester)

593S, 594S. Printmaking Studio
(0-V-V) (0-V-V) Staff
Studio projects and research in printmaking. (Every semester)

Design Program Courses
515S, 516S. Graphic Design Research
(0-V-V) (0-V-V) Staff
Special projects in visual communications for students of graphic design. (Every semester)

517S, 518S. Product Design Research
(0-V-V) (0-V-V) Staff
Special projects in product and systems design. (Every semester)

545D. Design Seminar
(0-V-1) (0-V-1) Design Staff
A team-taught seminar/critique that brings together all the design faculty and graduate students in a weekly dialogue focusing on issues in contemporary art as they relate to student research. This course is required of all design candidates each semester leading to and including the M.F.A. thesis year.

524. Etruscan and Roman Art and Architecture
(3-0-3) Rhodes
Roman art of the Republic and the Empire is one focus of this course, but other early cultures of the Italian peninsula and their rich artistic productions are also considered. In particular, the arts of the Villanovans and the Etruscans are examined and evaluated both as unique expressions of discrete cultures and as ancestors of and influences on Rome. The origins and development of monumental architecture, painting, portraiture, and historical relief sculpture are isolated and traced from the early first millennium B.C.E. through the early fourth century of the modern era.
known adjunct to the story of medieval art. In order to develop a more sophisticated understanding of this material we will examine the art produced in Byzantium in the period from the ninth to the 12th century, a period that marks the high point of Byzantine artistic production and influence. Stress will be placed upon the function of this art within the broader setting of this society. Art theory, the notions of empire and holiness, the burdens of the past and the realities of contemporary praxis will be brought to bear upon our various analyses of material from all media. How we, as art historians, can write the history of this rich culture will be a central issue of this course.

541. Trecento: Giotto to the Duomo (3-0-3) Gill
Beginning with Giotto’s Scrovegni Chapel in Padua, we examine the arts in Italy in the 1400s, concluding with Brunelleschi’s revolutionary design for the dome of Florence Cathedral of 1436. We consider the regional traditions of the city-states, including Siena, Venice, Florence, and Pisa, as well as Rome, and as expressed in narrative fresco programs, altarpieces, sculpture, and architecture. Among our subjects are the royal tombs in Naples and Milan, the evolution of the equestrian monument, St. Mark’s in Venice, the character of Gothic expression in Italy, and the impact of the Black Death.

542. 15th-Century Italian Renaissance Art (3-0-3) Rosenberg
This course investigates the century most fully identified with the Early Renaissance in Italy. Individual works by artists such as Brunelleschi, Donatello, Ghiberti, Botticelli, and Alberti are set into their social, political, and religious contexts. Special attention is paid to topics such as the origins of art theory, art and audience, portraiture and the definition of self, Medici patronage, and art for the Renaissance courts of northern Italy and Naples. (Alternate fall)

543. Northern Renaissance Art (3-0-3) Rosenberg
This course traces the development of painting in Northern Europe (France, Germany, and Flanders) from approximately 1300 to 1500. Special attention is given to the art of Jan van Eyck, Hieronymus Bosch, Albrecht Dürer, and Rogier VanderWeyden. In tracing the evolution of manuscript and oil painting and the graphic media, students become conscious of the special wedding of nature, art, and spirituality that defines the achievement of the Northern Renaissance. (Alternate fall)

544. The High Renaissance in Rome and Florence
It was Leonardo’s synthetic achievement that changed the course of history painting, and Bramante who adapted and made universal ancient Roman monumental architecture for a new generation of princely patrons. The vocabulary of this new modern style became the visual language of the fledgling Florentine Republic, the “imperial” Rome of Pope Julius II, and the humanistic court of Pope Leo X. This course will investigate the formulation of the High Renaissance in Milan and Central Italy as begun by Leonardo and Bramante, and its formulation in the hands of a younger generation of artists, most notably, Michelangelo, Raphael, Fra Bartolommeo, and Andrea del Sarto.

546. Venetian and Northern Italian Renaissance Art (3-0-3) Coleman
This course focuses on significant artistic developments of the 16th century in Venice, with brief excursions into Lombardy and Piedmont. Giorgione, Titian, and Palladio, the formulators of the High Renaissance style in Venice, and subsequent artists such as Tintoretto and Veronese are examined. An investigation of the art produced in important provincial and urban centers such as Brescia, Cremona, Milan, Parma, Varallo, and Verceli also provide insight into the unique traditions of the local schools and their patronage. (Alternate fall)

547. Italian Baroque Art (3-0-3) Coleman, Rosenberg
The focus of this course is on Roman art of the 17th century. The evolution of the style and content of painting, sculpture, and architecture in Baroque Italy is considered in light of the social, political, and religious climate of the period. Among the artists considered are Caravaggio, the Bolognese Caracci, and their followers, Guercino, Artemisia Gentileschi, Bernini, Borromini, and the French expatriates Poussin and Claude Lorrain. (Alternate spring)

548. The Age of Rembrandt: Northern Baroque Painting (3-0-3) Rosenberg
Epitomized by the self-conscious art of Rembrandt, Northern Baroque painting and printmaking not only became a domestic commodity sold in a more modern-looking marketplace, it also continued to serve its traditional political, moral, and spiritual functions. This course will concentrate on paintings and prints produced in Flanders, Spain, and the Dutch Republics during the 17th century, an era of extraordinary invention. The work of artists such as Rubens, vanDyck, Valázquez, Zurbarán, Leyster, Hals, and Rembrandt will be considered in the context of a number of interrelated themes including the business of art, the status of the artist, art in service of the state, the rise of genre, gender stereotypes, allegory, and art, religion, and spirituality. (Alternate fall)

549. Eighteenth-Century European Art (3-0-3) Coleman
Profound and universal inquiry into all aspects of knowledge marked the history of the century of the Enlightenment and the Grand Tour. The rise of the collective idea of nature; the study and instrumentality of the antique; the foundations of religion, the state, morality and reason; the relationship of the arts to the state; and the philosophy of aesthetic—these were all critically analyzed and questioned.

This course investigates various stylistic trends in 18th-century art in Italy, France, and England with a focus on the institutionalization of art through the academies. Discussion also centers on classical art theory and its relationship to the academies in light of the social, political, and religious climate of the period. We will also consider the aesthetic, art historical, and social consequences of the writings of Kant, Burke, and Winckelmann. The course begins with the late baroque paintings of Carlo Maratti and his followers, and then moves to subsequent stylistic trends as neoclassicism, Egyptian revival, and the rococo. Attention is also given to the vedute painters and such diverse personalities as Piranesi, Mengs, Kauffmann, Tiepolo, Watteau, and Chardin. (Alternate spring)

551. American Art (3-0-3) Pyne
This course treats American painting, architecture, and sculpture from the Puritan culture through the advent of early 20th-century Modernism. It examines the development of a cultural tradition that was produced by the northeastern Anglo-American elite classes. Among the major themes of the course are: the struggle for an
American identity; Protestant and Catholic forms in American art; nature and American identity; the ambivalent relationship of American artists to European art; the impact of evolutionary thought on American art; the representation of race and gender; imperialist agendas in American art; and the experimentation of American artists and architects with artistic Modernism.

552. British Art
(3-0-3) Pyne
This course focuses on the crucial period, from 1760 to 1870, in which a modern national identity was formed in England. The course explores the ways in which artists and architects responded to the baffling social problems created by the Industrial Revolution, and the various routes of engagement and escape these artists took in confronting modern England. The themes to emerge throughout the course are: science, industrialism, and the development of landscape painting; representations of the rural and urban poor; landscape and the sublime; the gothick imagination and the cult of sensibility; the revival of medievalism; the image of the modern industrial city; the regulation of sexuality in domestic genre painting; the problem of femininity in Pre-Raphaelite painting; evolutionary science and nature; and William Morris, design, and socialism.

553. 19th-Century European Art
(3-0-3) Pyne
This survey of 19th-century painting treats the major figures of the period within the context of the social, political, and intellectual ferment that shaped the culture—primarily, the numerous political revolutions and the rise of industrial capitalism and the middle class in France, England, and Germany. Among the artistic movements discussed are neoclassicism, romanticism, realism, pre-Raphaelitism, impressionism, and symbolism. Some of the major themes addressed are the relationships between tradition and innovation, between the artist and public, and between gender and representation, as well as the multiple meanings of “modern” and “modernism.” The class will visit the Snite Museum of Art on occasion to discuss special exhibitions related to topics in the course. (Alternate spring)

563. History of Design: Form, Values, and Technology
(3-0-3) Doordan
This course will provide a historical perspective on the development of industrial, product and graphic design in the 19th and 20th centuries. More than the aesthetic styling of products, design mediates the intersection of technology and cultural values in the modern era. The role of the modern designer as both a facilitator and a critic of industrial technology will be examined. Open to all students. (Alternate fall)

571. Topics in Greek and/or Roman Art
(3-0-3) Staff
Topics course on special areas of Greek and/or Roman art.

572. Topics in Byzantine Art
(3-0-3) Barber
Prerequisite: A 200- or 300-level Art History course or permission.
The content of this course will change from year to year. Intended for senior undergraduates and graduate students, it will examine narrow themes. Readings and discussion will be central to this class. Topics that might be addressed include: gender and sexuality, court culture, monasticism and spiritualty, and colonialism.

573. Topics in Renaissance Art
(3-0-3) Staff
Topics course on special areas of Renaissance art. (Alternate fall)

574. Topics in Baroque Art
(3-0-3) Staff
Topics course on special areas of baroque art. (Alternate spring)

575. Topics in American Art
(3-0-3) Staff
Topics course on special areas of American art. (Alternate spring)

576. Topics of British Art
(3-0-3) Staff
Topics course on special areas of British art. (Alternate fall)

577. Topics in Modern European Art
(3-0-3) Staff
Topics course on special areas of 19th-century and 20th-century European art. (Alternate spring)

578. Topics in Contemporary Art
(3-0-3) Staff
Topics course on special areas of contemporary art. (Alternate spring)

581. Seminar in Greek and/or Roman Art
(3-0-3) Staff
Seminar on specific subjects in Greek and/or Roman art. (Alternate fall)

582. Seminar in Byzantine Art
(3-0-3) Barber
Prerequisite: Permission required.
Seminar on specific subjects in Byzantine art. (Alternate fall)

583. Seminar in Renaissance Art
(3-0-3) Staff
Seminar on specific subjects in Renaissance art. (Alternate fall)

584. Seminar in Baroque Art
(3-0-3) Staff
Seminar on specific subjects in baroque art. (Alternate spring)

585. Seminar in American Art
(3-0-3) Staff
Seminar on specific subjects in American art. (Alternate spring)

586. Seminar in British Art
(3-0-3) Staff
Seminar on specific subjects in British art. (Alternate fall)

587. Seminar in Modern European Art
(3-0-3) Staff
Seminar on specific subjects in 19th-century and 20th-century European art. (Alternate spring)

588. Seminar in Contemporary Art
(3-0-3) Staff
Seminar on specific subjects in contemporary art. (Alternate spring)

596. Art History Methods
(3-0-3) Rosenberg
A survey of the historiography of art history with special attention paid to the various types of methodology that have been applied to the analysis of art. Special attention is given to 19th-century and 20th-century art historical methods. Required of all art history graduate students. (Fall)

681. Graduate Seminar
(3-0-3) Haywood, Pyne
Discussions in this course center on contemporary movements, styles, artists, aesthetic philosophies, and critical theories. Required of all studio/design and art history graduate students. (Fall)
Special Courses
For students with advanced standing in art, art history, and design.

595. Teaching Methods
(0-0-1) Staff

598. Special Studies
(V-V-V) Staff

599. Thesis Direction
(V-V-V) Staff
Independent research and writing on an approved subject under the direction of a faculty member. Required of candidates for the research M.A. in art history and for the M.F.A.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of all nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

Faculty

CHARLES E. BARBER, Associate Professor.

FREDERICK S. BECKMAN, Professor Emeritus.

JOHN CARUSO, Assistant Professor.

ROBERT R. COLEMAN, Associate Professor.

REV. AUSTIN I. COLLINS, C.S.C., Chair and Associate Professor.

JEAN A. DIBBLE, Associate Professor.

DENNIS P. DOOR DAN, Associate Professor of Architecture and Concurrent Associate Professor of Art, Art History, and Design.

PAUL A. DOWN, Associate Professor.

REV. JAMES F. FLANIGAN, C.S.C., Associate Professor.

MEREDITH GILL, Assistant Professor.

RICHARD L. GRAY, Director of Graduate Studies and Associate Professor.

ROBERT HAYWOOD, Assistant Professor.

DOUGLAS KINSEY, Professor Emeritus.

WILLIAM JAMES KREMER JR., Professor.

MARTINA LOPEZ, Associate Professor.

MARTIN L. NGUYEN, C.S.C., Assistant Professor.

DEAN A. PORTER, Director Emeritus of the Snite Museum of Art and Professor.

KATHLEEN A. PYNE, Associate Professor.

ROBIN F. RHODES, Associate Professor.

CHARLES M. ROSENBERG, Professor.

ROBERT SEDLACK, Assistant Professor.

JOHN F. SHERMAN, Associate Professional Specialist.

MARIA TOMASULA, Associate Professor.

The Department of Classics offers instruction in classical studies and is the administrative home to the programs in Arabic and Irish. The department cosponsors a master’s degree program in early Christian studies with the Department of Theology. The following courses are available to graduate students. Graduate students who intend to begin or renew their study of Greek, Latin, Arabic, Syriac, or Irish are invited to contact the department for advice.

Course Descriptions
Each course listing includes:
— Course Number
— Title
— (Lecture hours per week– laboratory or tutorial hours per week– credits per semester)
— Instructor
— Course Description
— (Semester normally offered)

Classical Languages

582. Medieval Art Seminar: Art and Worship
(3-0-3) Staff
This seminar will examine the history, function, theory, and meaning of the Byzantine icon.

697. Directed Readings
(V-V-V) Staff

Greek Language and Literature

501, 502. Graduate Greek III
(3-0-3) (3-0-3) Staff
The course presupposes no prior knowledge of Greek. It is the equivalent of the first two semesters of Greek.

503. Intermediate Greek
(3-0-3) Staff
Intermediate Greek combines a thorough review of the first year’s work with extensive reading of the unabridged text of a classical author. This course is also offered in the summer.

505. Intensive Greek
(3-0-3) Staff
A beginning course that presumes no previous knowledge of Greek. This course is the equivalent of two semesters of Greek. (Summer only)
510. Greek Historians
(3-0-3) Ladouceur
Readings in the histories of Herodotus and Thucydides. Discussion of the origins of the literary
form, techniques of characterization, principles of causality. Careful analyses of
the original text aided by modern secondary
scholarship. Translation, imitative composition,
and two papers required.

511. Intensive Greek
(3-0-0) Vacca
Identical to 505 but carries no credit.
(Summer only)

513. Intermediate Greek
(3-0-0) O'Connor
Identical to 503 but carries no credit.
(Summer only)

568. Readings in Byzantine Greek
(0-0-1) O'Connor
Ongoing weekly reading group of Byzantine
Greek. Readings are focused on short but
complete texts in hopes of producing and
making accessible workable translations.

Latin Language and Literature

475. Medieval Latin
(3-0-3) Gersh, Sheerin
An introduction to medieval Latin, its
philology, and literary history, and to the
instrumenta for study and research in the
field. (Cross-listed as MI 557.)

501, 502. Graduate Latin III
(3-0-3) (3-0-3) Staff
Beginning Latin. Graduate students have a
number of options for beginning study of
Latin; please contact the department for
advice.

503. Intermediate Latin
(3-0-3) Ladouceur
This course introduces all the fundamentals
of Latin grammar necessary for reading
classical Latin of medium difficulty. This
course is also offered in the summer.

505. Intensive Latin
(3-0-3) Ladouceur
This course introduces all the fundamentals
of Latin grammar necessary for reading
classical Latin of medium difficulty.
(Summer only)

510. Roman Historians
(3-0-3) Bradley
An introduction to Latin historiography
with particular emphasis on Sallust and
Livy. The course will also briefly survey the
history of the late republic and early Empire
to provide a context for the writings.

511. Intensive Latin
(3-0-0) Ladouceur
Identical to 505 but carries no credit. This
course is the equivalent of two semesters' study. (Summer only)

513. Intermediate Latin
(3-0-0) Siegel
Identical to 505 but carries no credit.
(Summer only)

574. The Vulgate and Related Texts
(3-0-3) Bower
Readings and critical discussion of the
various layers of texts in the Vulgate Bible.

579. Seminar: Latin Wit and Wisdom
(3-0-3) Bloomer
A seminar examining the collections and use
of sententiae in classical and medieval
schooling and literature.

Middle Eastern Languages

Arabic

501, 502. Beginning Arabic III
(3-0-3) (3-0-3) Staff
An introduction to modern standard
Arabic.

503. Continuing Arabic
(3-0-3) Afsaruddin
The third (intermediate) course in standard
Arabic.

504. Continuing Arabic
(3-0-3) Guo
This course is a continuation of third
semester Arabic. Emphasis will be on the
acquisition of reading, writing, and
speaking skills.

505. Arabic for Scholars: Introduction to
Koranic/Classical Arabic
(3-0-0) Guo
Identical to 505 but carries no credit.
(Summers only)

515. Advanced Arabic II
(3-0-3) Staff
Continuation of advanced study of literary
Arabic.

Syriac

500. Introduction to Syriac Grammar
(3-0-0) Amar
Introduction to the Syriac language.
(Summer only)

500A. Introduction to Syriac Literature
(3-0-0) Amar
Beginning readings in Syriac literature.
(Summer only)

500B. Intermediate Syriac Reading
(3-0-0) Amar
This is a new offering designed as a
“refresher course.” Emphasis will be on
reading a variety of prose and poetic texts
drawn mainly from the writings of St.
Ephrem as the basis for review of grammar
and basic structures. (Summer only)

535. Historical Survey of Syriac
Christianity in English
(3-0-3) Amar
(Summer only)

Middle Egyptian

505. Intensive Ancient Egyptian Hieroglyphs
(3-0-3) Vinson
This course will offer students an intensive
introduction to Middle Egyptian, the
classical language of Ancient Egypt, and the
hieroglyphic script used to write it. The
course presumes no previous knowledge of
Middle Egyptian. (Summer only)

511. Intensive Ancient Egyptian Hieroglyphs
(3-0-0) Vinson
Identical to 505 but carries no credit.
(Summer only)

Hebrew

481, 482. Elementary Biblical Hebrew III
(3-0-3) Staff
This is a two-semester introductory course in biblical Hebrew; under normal circum-
stances, the student must complete the first
in order to enroll in the second.
Irish Language

501, 502. Beginning Irish I/II
(3-0-3) (3-0-3) McQuillan
An introduction to modern spoken and written Irish: basic principles of grammar and sentence structure, as well as core vocabulary. Emphasis is placed on the application of these principles in everyday situations. Students learn how to conduct simple conversations: talking about oneself and asking information of others; talking about family and home; describing the weather and daily activities. At least one class per week meets in the Language Resource Center to enable students to work on their pronunciation and communicative fluency. Second semester of instruction in the Irish Language is a continuation of 501. More emphasis will be placed on reading simple texts in Irish.

503. Intermediate Irish
(3-0-3) McQuillan
A continuation of Irish 501 and 502 with increased emphasis on the ability to read 20th century literary works in the original Irish.

505. Introduction to Old Irish
(3-0-3) McQuillan
This course is intended for absolute beginners. It will introduce the basic elements of the grammar and phonology of Old Irish, mostly through the medium of the original literature, in particular narrative prose texts (sagas) and lyric poetry. An opportunity may arise to look at some legal and didactic material as well. (Summer only)

507. Introduction to Old Irish
(3-0-0) McQuillan
Identical to 505 but carries no credit. (Summer only)

597. Directed Readings
(V-V-V) Staff

Middle Eastern Literature in Translation

560. Canon and Literature of Islam
(3-0-3) Asfaruudin
This course is an introduction to the religious literature of the Arab-Islamic world. Emphasis is on works from the classical and medieval periods of Islam, roughly from the seventh to the 14th century of the Common Era.
**Contributing Faculty:**
JOSEPH P. AMAR, Associate Professor of Classics
Syriac and Arabic Christian Literature

CHARLES E. BARBER, Assistant Professor of Art, Art History, and Design
Early Christian and Byzantine Art

JOHN C. CAVADINI, Associate Professor of Theology
Patristic Theology

BRIAN E. DALEY S.J., Hauking Professor of Theology
Patristic Theology

BLAKE LEYERLE, Associate Professor of Theology
Social History of Early Christianity

DANIEL J. SHEERIN, Associate Professor of Classics
Christian Latin Literature (on leave 2002)

**Associated Faculty:**
ASMA AFSARUDDIN, Assistant Professor of Classics
Islam

DAVID E. AUNE, Professor of Theology
New Testament

W. MARTIN BLOOMER, Associate Professor of Classics
Classics, Ancient Education

PAUL M. COBB, Assistant Professor of History
Islamic History

MARY ROSE D’ANGELO, Associate Professor of Theology
Gender in Early Christianity

STEPHENV. GERSH, Professor of Medieval Studies
Late Antique Philosophy

DAVID T. JENKINS, Assistant Librarian
Byzantine Librarian

MAXWELL E. JOHNSON, Associate Professor of Theology
Early Christian Liturgy

MARY M. KEYS, Assistant Professor of Government and International Studies
Early Christian Political Thought

JOHN P. MEIER, Professor of Theology
New Testament

HINDY NAJMAN, Assistant Professor of Theology
Rabbinics

JEROME H. NEYREY, S.J., Professor of Theology
Biblical/Literary Studies

DAVID K. O’CONNOR, Associate Professor of Philosophy
Classical Philosophy

GRETCHEN J. REYDAMSSCHILS, Associate Professor in the Program of Liberal Studies
Late Antique Philosophy

MICHAEL A. SIGNER, Abrams Professor of Jewish Thought and Culture, Department of Theology
Rabbinic Judaism

GREGORY E. STERLING, Associate Professor of Theology
Biblical and Post-biblical Greek

**East Asian Languages and Literatures**

**Chair:**
Lionel M. Jensen

**Telephone:** (219) 631-8874

The University of Notre Dame does not offer a graduate degree in Chinese or Japanese. Graduate students who wish to audit a Chinese or Japanese language class must receive permission from the instructor.

**Course Descriptions**

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week--labatory or tutorial hours per week--credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

**Chinese Language Courses**

101, 102, 103. Beginning Chinese I, II, and III
(3-0-0) (3-0-0) (3-0-0) Yin
For students with no background in Chinese. A three-semester sequence of three-credit courses covering the same material as 111-112 and designed to prepare students to enter 211, 101 and 103 are offered only in the spring semester, 102 only in the fall. Equal emphasis on the basic skills to higher levels of sophistication:

111, 112. First Year Chinese I and II
(3-0-0) (5-0-0) Ge
For students with no background in Chinese. Introduction to Mandarin Chinese, using traditional characters. Equal emphasis on the basic skills of speaking, listening, reading, and writing. Students may expect to master a spoken vocabulary of about 1,000 words and a written vocabulary of 500 characters.

211, 212. Second Year Chinese I and II
(5-0-0) (5-0-0) Yin
Prerequisite: 112 or instructor’s permission. Grammar review and training in the four basic skills to higher levels of sophistication: oral-aural skills for fluency in communication, reading for critical understanding, and the ability to write simple compositions.

311, 312. Third Year Chinese I and II
(3-0-0) (3-0-0) Yin
Prerequisite: 212 or instructor’s permission. Development of advanced conversational, reading, and writing skills, using a wide range of authentic materials, including material from news media.

411, 412. Fourth Year Chinese I and II
(3-0-0) (3-0-0) Wan
Prerequisite: 312 or instructor’s permission. Practice in advanced conversational, reading, and writing skills, using newspapers, short fiction, videotapes, and other authentic materials.

**Japanese Language Courses**

101, 102, 103. Beginning Japanese I, II, and III
(3-0-0) (3-0-0) (3-0-0) Hanabusa/Shiga
A three-semester sequence of three-credit courses covering the same material as 111-112 and designed to prepare students to enter 211, 101, and 103 are offered only in the spring semester, 102 only in the fall. Introduction to the fundamentals of modern Japanese. Equal emphasis on speaking, listening, reading, and writing.

111, 112. First Year Japanese I and II
(5-0-0) (5-0-0) Hanabusa
Introduction to the fundamentals of Japanese. Equal emphasis on the four skills: speaking, listening, reading, and writing.

211, 212. Second Year Japanese I and II
(5-0-0) (5-0-0) Shiga
Prerequisite: 112 or instructor’s permission. Continued training in the fundamentals of the modern language. Equal emphasis on the four skills: speaking, listening, reading,
and writing. Introduction to approximately 200 kanji.

311, 312. Third Year Japanese I and II
(3-0-3) (3-0-3) Hanabusa
Prerequisite: 312 or instructor’s permission.
The first in a sequence of intermediate courses offered for those students who did not participate in the Year-in-Japan Program. Development of oral-aural skills with an emphasis on typical conversational situations. Improvement of reading and writing skills.

411, 412. Fourth Year Japanese I and II
(3-0-3) (3-0-3) Shiga
Prerequisite: 312 or instructor’s permission.
The second in a sequence of intermediate courses for those students who did not participate in the Year-in-Japan Program. Aims at achieving a high proficiency in the four skills: speaking, listening, reading, and writing.

498. Special Studies
(3-0-0) Selden
Prerequisite: Instructor’s permission, based on student’s performance on a placement exam and oral interview at the beginning of the semester. Basic command of Japanese grammar is assumed. This course takes students beyond textbook Japanese by introducing original materials created for Japanese audiences (literature, current events, and video materials, etc.) Emphasis is on grammar and syntax, vocabulary building, speaking, reading, and writing.


English
Chair:
Chris R. Vanden Bossche
Director of Graduate Studies:
Greg P. Kucich
Director of Creative Writing:
Sonia Gernes
Telephone: (219) 631-6618

The Program of Studies
The Department of English at the University of Notre Dame is distinguished by the extraordinary diversity. In addition to study in the traditional fields of medieval, Renaissance, Restoration and 18th-century, Romantic, Victorian, early American, modern British, and modern American literature, it offers opportunities to work in interdisciplinary fields and programs such as Irish studies, literature and philosophy, religion and literature, the history of science, gender studies, and the Medieval Institute. The intellectual life of the department is further enriched by the presence of literary critics to our campus. The graduate programs in English seek to combine a formal course of study with encouragement to develop intellectual independence. Students in the Ph.D. program, for example, begin with intensive course work and move toward independent and specialized study. We also seek to train students not only in the history of literature, but also in the traditions of critical inquiry, and we have made the study of literary theory as well as literary history an integral part of the program.

Admission
Applicants to both the M.A. and the Ph.D. programs are expected to have completed eight or more upper-division English courses. They must also take the Graduate Record Examination general and subject tests. In addition to other materials required by the Graduate School, the applicant should submit a writing sample, preferably a critical literary essay of 10-15 pages. Special conditions apply for applicants to the creative writing M.F.A. program. Creative writing applicants need not take the GRE subject test and they need not have taken eight English courses. As a writing sample, they should provide 40 pages of fiction, 20 pages of poetry or an equivalent amount of other appropriate writing.

Master’s Program
English and American Literature
This is a 30-credit-hour program, requiring either 30 credit hours of course work or 24 credit hours of course work and six credit hours of thesis research. Students must take one course in literary criticism or theory. Those seeking the research degree must also demonstrate proficiency in a language appropriate to their area of research. Near the conclusion of the program, the student takes a written examination covering three major literary texts and selected criticism; this examination is designed to test the student’s capacity for critical study.

Master’s Program in English and Law
This is a program open only to students already admitted to the Notre Dame Law School who also wish to obtain an M.A. in English. A student would typically take 18 hours of English courses and 12 hours of law courses. The course on “Law and Literature,” offered in the Law School, can be counted towards the 18 hours of English. Students would normally pursue the nonresearch degree; those wishing to complete the research degree would need to complete an additional six hours of thesis research. Admission is through the normal procedures of the Graduate School and the Department of English.

M.F.A. in Creative Writing
This is a 36-credit-hour program, the credit hours divided among writing seminars, tutorials, and literature courses. Throughout the two-year program, the student works closely with a member of the creative writing faculty on a thesis project that consists of a volume of the student’s
work in a state acceptable for publication, usually a novel, a collection of short stories, a volume of poetry, or a work of literary nonfiction. Completion of this program normally takes two years. See above for admission requirements.

**Ph.D. Program**

**Course Requirements**
The Ph.D. program requires 48 credit hours of course work. Students must take the Introduction to Graduate Study, a historical distribution of courses, and at least one course in literary theory. In keeping with its policy of encouraging interdisciplinary study, the program permits the student to take up to 12 credit hours of course work in a field other than English.

**Foreign Language Requirement**
The student must demonstrate proficiency in one language verifiably appropriate to the Foreign Language Requirement course work in a field other than English.

Upon receiving approval of the proposal, the student proceeds with the dissertation under continuing supervision of the dissertation director. The dissertation is intended to demonstrate the student’s readiness to participate fully in the profession as a scholar and literary critic.

Further information about financial aid opportunities, the department’s many programs and activities and the faculty is contained in a brochure, obtainable by writing to the Graduate School.

**Concentrations**

**Literature and Continental Philosophy**
The special field of studies in literature and continental thought is designed to take advantage of the interdisciplinary resources in continental thought existing at Notre Dame. In addition to the resources of the English department, this specialty track draws upon other areas in the humanities that have been influenced by continental thought: philosophy, government, sociology, and theology. In many of these areas researchers at Notre Dame have achieved national and international recognition for their scholarly work. The setting of this program provides students with a unique opportunity to pursue a Ph.D. in English specializing in the area of literature and continental philosophy.

The following rules apply to students pursuing studies in the field of literature and continental thought: Students will complete the traditional course sequence, Introduction to Graduate Study, and all course distribution requirements. Students will take a minimum of four courses in the area of literature and continental philosophy, chosen in consultation with their adviser, for a combined total of at least six courses in the special field of study. With the permission of the graduate director, up to three courses could be taken outside of the English department.

**Early Studies**
The concentration in early studies makes it possible for the student to draw on the department’s strengths in English literature before 1700 and in contemporary theory. A concentration in early studies complements the disciplinary and intellectual challenges specific to the student’s area of specialization (old English, middle English, or Renaissance literature). Characteristic questions include problematizing traditional models of literary history and period boundaries, or foregrounding the construction of subjectivity across those boundaries. For this reason, the concentration requires the student to develop a particular theoretical approach, chosen in consultation with his or her director. Dissertation projects will normally require joint direction. Students will complete the traditional course sequence. In addition, students will take at least four other courses from the seventh to the 17th century, based on close consultation and advising with the faculty members in these fields. With the permission of the graduate director and the student’s adviser, students may take up to three courses outside the English department. When the student begins dissertation work, he or she will participate in a dissertation seminar devoted specifically to work in early studies.

**Irish Studies**
The concentration in Irish studies draws upon the existing resources in the Keough Institute for Irish studies, the English department, the Medieval Institute, Notre Dame’s Dublin Program, the Irish Summer Seminar in Dublin, and other Notre Dame departments, such as History, actively participating in Irish Studies. The ongoing development of Irish Studies at Notre Dame provides a unique opportunity for students to specialize in this area. Students must take three courses in Irish language and literature, as follows: 101, 102, and 103 or, in place of 103, a course in Irish literature translation. Students will complete the traditional course sequence. In addition, students must take four courses in Irish studies with the English department; two of those courses taken from the Irish studies offerings in any one or combination of the following departments: history, government and politics, Irish language or literature.

**Publications**
The Department of English publishes two scholarly journals, Religion and Literature and Nineteenth-Century Contexts, and a literary quarterly, The Notre Dame Review. All three publications provide graduate students with the opportunity to learn about the process of editing and production.

**Financial Assistance and Funding for Professional Activity**
The full range of financial assistance, including fellowships (University Presidential Fellowships, first-year fellowships, ethnic minority fellowships, and others), teaching assistantships, and tuition scholarships, described in the general Graduate Studies brochure, is available to students in the English programs. All students admitted into the Ph.D. program
receive full funding, which continues to be provided throughout course work and dissertation work. The English department is also committed to supporting students’ involvement in professional activities. Funding is provided for research travel and participation in academic conferences. Please note that the request to be considered for financial support is made on the application for admission. No separate application is needed.

Preparation for the Profession: Teaching and Scholarship

The English department offers all graduate students a variety of teaching opportunities and professional preparation activities, all designed to provide students with important professional experience and to place them in a highly competitive position for entering the job market. All beginning students enroll in a semester workshop on “Teaching Literature and Writing,” followed by two intensive orientation meetings on teaching First-Year Writing. Students then typically teach four semesters of First-Year Writing, never more than one class a semester and with class enrollments kept to 17. More advanced students have opportunities to teach upper-level literature courses. We also have instituted a predoctoral teaching fellowship that enables students to teach literature at a neighboring university, such as the University of Illinois-Chicago. Postdoctoral teaching fellowships are also available. Students entering the dissertation phase of the program all participate in a semester workshop on producing a dissertation proposal in a timely fashion. Students enroll later in a “Preparing for the Profession” seminar, which concentrates on preparing papers for academic conferences, submitting essays for publication to academic journals, and developing strategies for entering the job market. Our job placement apparatus consists of practice job interviews and facilitates students generally in their searches for academic employment.

Course Descriptions

Course offerings are designed for a two-year sequence so that most courses will be offered every other year.

Each course listing includes:
— Course Number
— Title
— (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
— Instructor
— Course Description

502. Graduate Poetry Writing Workshop (V-V-V) Staff
503. Graduate Fiction Writing Workshop (3-0-3) Gernes, O’Rourke, Sayers
504. Graduate Poetry Writing Workshop (3-0-3) Gernes, Matthias
505. English for Non-native Speakers (3-0-3) Deane-Moran
506. Introduction to Graduate Study (3-0-3) Staff
508. Current Issues in Critical Theory (3-0-3) Bruns, Buttigieg, E. Ziarek, K. Ziarek
510. Introduction to Critical Theory (3-0-3) Bruns, Buttigieg, Hendler, E. Ziarek, K. Ziarek
513A. Feminist Critical Theory (3-0-3) Baldwin
513B. Theories of Postmodern Culture (3-0-3) Collins
515B. The Ancient Novel (3-0-3) Doody
530. Old English Language and Readings (3-0-3) Lapidge, O’Brien-O’Keeffe
530B. Old English Biblical Verse (3-0-3) Lapidge
530C. Latin Literature of Anglo-Saxon England (3-0-3) Lapidge
531. Beowulf (3-0-3) O’Brien-O’Keeffe
532A. English Religious Writing (3-0-3) Nolan
532B. Chaucer and Langland (3-0-3) Frese, Mann
532C. What Happened before Chaucer? (3-0-3) Mann
533A. Studies in Middle English Literature (3-0-3) Frese, Mann, Nolan
539B. Arthurian Literature
(3-0-3) Frese
A study of the Arthurian tradition from Mallory to Tennyson.

541. Sixteenth-Century Drama
(3-0-3) Lander
A study of drama from the Tudor period through early Shakespeare.

544. Shakespeare
(3-0-3) Bruns, Lander
A study of the plays and their literary relationships.

545. Studies in 16th-Century British Literature
(3-0-3) Hammill, T. Krier, Lander
Specialized studies in the various genres of sixteenth-century British literature and their historical contexts. Readings in poetry, drama, fiction, and nonfictional prose of the period.

546. Studies in 17th-Century British Literature
(3-0-3) Hammill, T. Krier, Lander
Specialized studies in the major dramatic works of the seventeenth century by Shakespeare and others, as well as detailed readings in lyric poetry, and religious and political writings.

547. Milton
(3-0-3) Fallon
A detailed analysis of Milton’s writings, with special focus on the religious and political contexts of his work.

548A. Books, Authors, and Reading in Early Modern England
(3-0-3) Lander
A study of important recent work on authorship, the history of the book, and the history of reading in early modern England.

550. Studies in 18th-Century Literature
(3-0-3) Doody, Fox, Gibbons, Jemielity, Walton
A study of the poetic tradition in Britain stretching from Dryden to Johnson.

553. Aesthetic Theory and the Enlightenment
(3-0-3) Doody
An examination of the rise of the British novel in the 18th century and its important historical roots in earlier periods.

554A. Psychology and Literature in the 18th Century
(3-0-3) Fox
A examination of the development of 18th-century British psychological writing and its relation to the literature of the period.

559. Burke and the Idea of Revolution
(3-0-3) Deane
A study of the writings of Edmund Burke in the context of Irish history and the French Revolution.

559B. Reading the French Revolution
(3-0-3) Deane
An analysis of the ways in which readings of the French Revolution in the period from 1790-1830 helped to produce early versions of modernity and of the aesthetic practices that accompanied it.

560. Romanticism and History
(3-0-3) Kucich
A study of romanticism and the construction of cultural history.

562A. Romanticism, Gender, and Colonialism
(3-0-3) Kucich
A study of the interplay of gender and colonial culture in romantic-era writing.

564. 19th-Century British Novel
(3-0-3) Vanden Bossche
A study of major British nineteenth-century novels in relation to changing class, gender, and social relations during the Victorian period.

565. Victorian Poetry and Poetics
(3-0-3) Sniegowski
A study of the major Victorian poets and Victorian poetic theory.

566B. Victorian Women Prose Writers
(3-0-3) Staff
Criticism, biography, autobiography, and history by Victorian women authors.

567. Gender and Power in Victorian Literature
(3-0-3) Psomiades
A historical analysis of forms of power in Victorian literature.

568. 19th-Century Novel
(3-0-3) Vanden Bossche
A study of the major fiction writers of the 19th century.

570. Modern British Poetry
(3-0-3) Matthias
A study of the major British poets of the 20th century.

571E. Contemporary British Drama
(3-0-3) Harris
An investigation of the major authors, developments, and crises that emerge in British drama throughout the 20th century.

573A. Modern British Novel
(3-0-3) Buttigieg, Green
A study of the major fiction writers of the modern period.

573B. Representing Ireland
(3-0-3) Gibbons
A study of the politics of representation in Irish culture in terms of contemporary theories of romanticism, modernity, and post colonialism.

573C. History of Modern America
(3-0-3) E. Ziarek
A study of the history of aesthetics from the 18th to the 20th century, this course traces the genealogy of the main debates about the social functions of art in modernity.

574. Studies in Modern British Literature
(3-0-3) Bruns, Buttigieg, Green, E. Ziarek
A study of British poetry, drama, and fiction of the 20th century.

575. Irish Literary Modernism
(3-0-3) Deane
A study of Irish revivals literature (1880 to 1930).

577A. Anglo-Irish “Gothic”
(3-0-3) Walton
An attempt to interpret the uses of the uncanny and the supernatural in Anglo-Irish fiction of the 19th century.

577B. Representing Ireland
(3-0-3) Gibbons
A study of the politics of representation in Irish culture in terms of contemporary theories of romanticism, modernity, and post colonialism.

579B. Postcolonial Literature
(3-0-3) Johnson-Roullier
An introduction to the literary and theoretical developments brought about by the decline of the period of European imperial domination.
An examination of the ways in which race, gender, and sexuality and their interrelationships structure the discourse of black women writers since the 1970s.

596A. Afro-American Literature: Major Works and Periods
(3-0-3) Brogan, Irving
A chronological examination of the most significant periods, writers, themes, and forms of Afro-American literature.

596C. Poetics: Modern and Contemporary
(3-0-3) Fredman and Bruns
A study of some of the major texts in modern and contemporary European and North American poetry and poetics.

598. Special Studies
(3-0-3) Staff

599. Thesis Direction
(V-V-V) Staff
Research and writing on an approved subject under the direction of a faculty member.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

603. Small Press Literature and Publishing
(V-V-V) Staff

697. Directed Readings
(3-0-3) Staff
Directed readings for examinations in the doctoral program.

699. Research and Dissertation
(V-V-V) Staff
Independent research and writing on an approved subject under the direction of a faculty member.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

701A, 701B. Teaching Seminar
(1-0-1) (1-0-1) Greene, Kucich
Classroom techniques and methodology for teaching composition and literature. An analysis of teacher preparation, classroom presentation, and student consultation and work.

7024. Scholarly Publication Practicum
(1-0-1) Dougherty, Werge
For students working with Religion and Literature, one of the English department's scholarly journals.

Faculty


REV. PAUL E. BEICHNER, C.S.C., Professor Emeritus. A.B., Univ. of Notre Dame, 1935; M.A., ibid., 1941; Ph.D., Yale Univ., 1944. (1945)


JACQUELINE V. BROGAN, Professor, B.A., Southern Methodist Univ., 1974; M.A., ibid., 1975; Ph.D., Univ. of Texas, 1982. (1986)


JAMES M. COLLINS, Associate Professor of Film, Television, and Theatre and Concurrent Associate Professor of English. B.A., Univ. of Iowa, 1975; Centres des Etudes Cinematographique, France, 1977; Ph.D., Univ. of Iowa, 1984. (1985)


JAMES P. DOUGHERTY, Professor, A.B., St. Louis Univ., 1959; M.A., Univ. of Pennsylvania, 1960; Ph.D., ibid., 1962. (1966)


STEPHEN M. FALLON, Concurrent Associate Professor. A.B., Princeton Univ.,
The Division of Humanities

80

German Language and Literature

Chair:  Robert E. Norton
    Director of Graduate Studies:  Albert K. Wimmer
    Telephone:  (219) 631-5572
    E-mail:  grl@nd.edu  (www.nd.edu/~grl)

The Program of Studies

The Department of German and Russian Languages and Literatures offers an M.A. degree in German. The primary aim of the master’s program is to provide students with a comprehensive background in the literary and cultural achievements of the German-speaking countries. The courses of study provided will, in most instances, lead to a career in teaching and scholarship, but they may also serve as fundamental training for those who plan to enter professions based on international relations or where an advanced knowledge of German plays an auxiliary role.
General Requirements
Graduate study in German assumes a prior undergraduate major in German or its equivalent. The graduate adviser, in conjunction with the department chair, will help to determine the individual course of study for each student once on campus. All candidates for the M.A. degree in German are expected to take a minimum of 30 credit hours in their specialized area or related fields. The master’s program combines intensive literary studies with advanced courses in related areas of other disciplines, such as other foreign languages, art, English, government, history, international studies, music, philosophy, psychology, and theology. The goal of advanced studies in the department is the critical understanding and articulation of the culture of other nations as reflected primarily in their literatures. It is assumed that applicants for admission to the M.A. program in German are already fluent in the language, especially if they also apply for a teaching assistantship.

Upon their arrival on campus, graduate students will be advised of their course of studies and given detailed instruction on how to plan their four semesters of graduate work. Besides taking advanced courses, the student is also responsible for the reading list that covers the various periods of German literature. During the first year of study, an oral proficiency examination in German will determine candidacy for the master’s degree. Furthermore, incoming graduate students are required to attend a weeklong orientation prior to the beginning of classes, enroll in GE 501 (SLA Theory and Practice: Understanding the Profession), and work closely with a member of the German faculty on departmental matters of teaching, learning, and proficiency testing. (GE 501 does not count toward the 30 credit hours required for the M.A.) The master’s program is concluded by a comprehensive written examination designed to test satisfactory knowledge of two areas of concentration and sufficient competency in four other fields of the German literary tradition. The precise areas of concentration on the examination will be determined by the graduate adviser, in consultation with the department chair, and is based on the interests of the individual student. To the extent possible, graduate students will be given the opportunity to participate in the elementary language teaching of the department. Students in the master’s research program may earn up to six of their required 30 credit hours in researching and composing the thesis required of all research students.

Course Descriptions
Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
- Instructor
- Course Description
- (Semester normally offered)
Not all courses are offered every year.

Graduate Reading Courses

500. German Graduate Reading
(3-0-3) Liontas, Weber
Intended as review for graduate students who wish to take the Graduate Reading Examination in German. The final examination of the course, if passed, fulfills the requirements of the Graduate Reading Examination.

501. SLA Theory and Practice: Understanding the Profession
(3-0-3) Liontas
This methodology course for pre- and in-service secondary teachers and graduate teaching assistants recognizes the vital need for second language learning in the curriculum of the future, pursues new directions in second language acquisition (SLA) research, and develops creative ways to enhance teaching, learning, and testing in the classroom. Participants are challenged to ask new questions that research efforts have only begun to address and to make their own theories and hypotheses of how SLA occurs explicit. The goal is for participants to understand, clarify, and articulate their beliefs and practices about language teaching and learning, including various theoretical and practical insights into what it means to be proficient in a language. It is also hoped that participants will gain a new perspective on how adult learners develop proficiency in a second language (from empiricist to rationalist views), become familiar with past and current methodological approaches and practices, reexamine current assumptions and language teaching practices, and achieve an integrated perspective of the issues surrounding contextualization of the four skills and culture, proficiency-oriented classroom testing, lesson and curriculum planning, and, finally, use of authentic materials and emerging digital technologies for second language learning.

502. Technology in Foreign Language Teaching
(1.5-0-1.5) Williams
There is no question that technology has affected teaching. For foreign language teaching, with its unique characteristics and needs, technology has great potential indeed. But technology is not a method or a curriculum. It is a tool that can be used to enhance the development of all four skills in language learning, no matter which methodology is in place. In this course students will learn to use various forms of technology, including the language lab classroom, computers, CALL (computer-assisted language learning) software, multimedia packages, satellite transmissions, and the World Wide Web. Hands-on training will enable students to become familiar with a variety of equipment, and reading and discussion will help students develop a critical approach to any technology they might consider using in teaching. Students will develop skills in evaluating technology and in integrating it into the foreign language curriculum.

Courses in German Literature

515. Medieval German Literature
(3-0-3) Wimmer
A survey of the developments in literature and art of the Middle Ages. (Fall)

520. Love and Violence in Medieval German Literature
(3-0-3) Christensen (in German)
This course will investigate the interplay of love and violence in a fascinating variety of secular and religious texts by both women and men from the German Middle Ages. Knowledge of Middle High German is not required, but, where available, students will read modern German with facing medieval text.

526. The Baroque Period
(3-0-3) Staff
A survey of the development of baroque forms in literature and art during the 17th century. (Offered as Directed Readings)

530. The Age of Enlightenment
(3-0-3) Staff
A study of the impact of the new physical sciences and rationalistic philosophy upon the life and belles lettres of 18th-century England, France, Germany, Spain, and Italy. (Offered as Directed Readings)
541. Goethe and His Age  
(3-0-3) Norton  
An intensive study of Goethe’s major works of poetry, prose, and drama within the 
cultural framework of his times.

550. The Nazi Past in Postwar German Film  
(3-0-3) Hagens  
How have German films since 1945 been 
trying to deal with the Nazi past? How do 
Germans picture their memories of the 
Third Reich? How do they define them-

555. German Drama 1750 to the Present  
(3-0-3) Hagens (in German)  
We will read and discuss some of the 
greatest plays in the German dramatic 
tradition, by authors such as: Lessing, 
Goethe, Schiller, Kleist, Grillparzer, 
Nestroy, Freitag, Hauptmann, 
Hofmannsthal, Brecht, and Werfel. This 
semester we will focus on the so-called 
“drama of reconciliation,” a newly rediscover-
ered genre, where the conflict is serious but 
ends harmoniously. By interpreting classic 
German-language plays in the original, you 
will (1) learn how to approach drama 
analysis, and you will (2) develop a sense for 
the history of drama throughout the past 
250 years. In addition, we will study a few 
short, and often English-language, texts in 
the theory of drama (Aristotle, Schelling, 
Carriere, and Cavell, as well as our 
department’s own Hösele and Roche), which 
will (3) allow you to differentiate between 
the basic genres of drama (tragedy, comedy, 
and drama of reconciliation), and you will 
(4) understand better the nature of conflict 
and reconciliation. Students interested in 
other national literatures will have the 
opportunity to draw comparisons with plays by 
authors such as Aeschylus, Sophocles, 
Shakespeare, Calderon, Corneille, Racine, 
and Ibsen; and those interested in film may 
branch out into analyzing works by 
directors such as Hitchcock, Renoir, Ford, 
Capra, Curtiz, Hawks, Chaplin, and 
Kurosawa.

566. 19th-Century German Literature  
(3-0-3) Norton (in German)  
The 70 years that separate the death of 
Goethe in 1832 and the end of the 19th 
century are rich in examples of literary and 
cultural achievement. This diversity and 
complexity has given rise to a variety of 
epochal designations—Biedermeier, 
“Vormärz,” Realism, Naturalism, Symbol-
ism, to name the most prominent—which 
have served to categorize each successive 
generation’s literary, political, and social 
agenda. In this course, we will consider the 
main outlines of 19th-century German 
literature (including in Austria and 
Switzerland) by studying representative 
works of all major genres—prose, poetry, 
drama—and by some of the greatest writers 
of their day: Mörike, Heine, Grillparzer, 
Hebbel, Keller, Meyer, Raabe, Fontane, and 
George.

570. Modern Lyric Poetry  
(3-0-3) Profft  
A close reading and analysis of 19th- and 
20th-century German poetry with particular 
emphasis on George, Rilke, Brecht, 
Lehmann, Krolow, and Piontek. (Every two 
years)

575. The World as Theater  
(3-0-3) Hagens  
“All the world’s a stage”—this insight has 
been dramatized by many playwrights. 
While the core of this idea seems to have 
remained the same (namely, the world is 
like a theater, human existence like a play, 
and we are like actors), the form of the idea 
have gone through many telling variations. 
By observing these changes, we will not 
only learn about the history of drama and 
theater over the past 350 years, but also 
about the relation between a stage play and 
the rest of reality; and most importantly, we 
will find out what the foremost dramatists 
advocated our proper role in life should be. 
We will read, discuss, and write about some 
of the greatest dramas in the German-
language tradition by authors such as: 
Weise, Tieck, Hofmannsthal, Brecht, 
Weiss, Handke, Duerrenmatt, and Tabori.

577. The Holocaust in German Theater and Film  
(3-0-3) Hagens (in German)  
We will study German, Austrian, and Swiss 
stage plays and films that have the Holo-
caust for their central issue. Our close 
analyses will be framed by broader ques-
tions: How can the (re-)presentation of evil 
on stage or screen become meaningful—or 
is such an endeavor beyond the limits of 
(re-)presentation? What are the respective 
weaknesses and strengths of theatre and 
cinema when confronted with this challeng-
ing topic? How do German and Austrian 
plays and films about the Holocaust differ 
from the ones produced in other countries?
582. The Literature of Unified Germany (1989–2000) (3-0-3) Christensen (in German)
How has German identity changed since 1989? In what ways has the status quo of divided Germany been maintained, even fortified, by unification? Is the literature written in Germany since 1989 merely reflecting or is it influencing societal, cultural, or political change? Or is it indeed independent of such changes? In order to begin to answer these questions, we will read a variety of texts written in Germany since late 1989. To facilitate deep exploration and discussion, we will read a relatively small number of texts that will nonetheless represent a wide range of genres (novel, short story, drama, poetry, and reportage). Authors will likely include Christa Wolf, Günter Grass, Dürrenmatt’s Der Verdacht, Wilde’s The Picture of Dorian Gray, and Gide’s The Immoralist, this seminar will hope to come to an understanding of the nature of evil and its relationship to lying, to self-esteem, and to self-love, among other aspects.

592. Schopenhauer (3-0-3) Hösle
Schopenhauer’s philosophy signifies a great break in the history of Western philosophy: no longer Reason, but the Will becomes the grounding principle; Schopenhauer claims furthermore to integrate in a productive way Buddhism into his pessimistic worldview. His influence on the philosophy, and also on the arts of the 19th and 20th centuries, has been enormous, not least of all because of his original aesthetics. We will read his main work, The World as Will and Representation.

594. Thomas Mann (3-0-3) Hösle
Thomas Mann is certainly the most influential German novelist of this century. Rooted in the Bildungsbürgertum of the 19th century, influenced by Richard Wagner and the philosophies of Arthur Schopenhauer and Friedrich Nietzsche, he is at the same time a profoundly modern writer with remarkable innovations in narrative techniques. We shall read three of his novels that deal with general cultural and political issues—the humanizing power of myth (Joseph and his Brothers), the greatness of an outstanding individual and its unhealthy impact on his environment (Lotte in Weimar), and the development of modern art at the price of the dissolution of its bonds with morality and its political consequences (Doktor Faustus).

595. Nietzsche (3-0-3) Hösle
Nietzsche’s philosophy represents one of the greatest disruptive moments in the history of philosophy: no one has destroyed as many assumptions as radically as Nietzsche. At the same time, his work represents a challenge to the literary mind in as much as Nietzsche discovered new forms of expression for philosophical thought. Everyone interested in German intellectual history as well as in the philosophy of the 20th century should study his work, even if he or she comes to the conclusion that Nietzsche’s arguments for this break in the tradition are not convincing.

597. Directed Readings (V-V-V) Staff
An individual reading or research course for German language degree candidates only.

Faculty
JOHN I. LIONTAS, Assistant Professor and Second Language Acquisition Specialist. B.A., Univ. of St. John’s, New York, 1984; M.Ed., Univ. of South Carolina, 1989; Ph.D. Univ. of Arizona, 1999. (2000)
ROBERT E. NORTON, Chair, German and Russian Languages and Literatures and Professor of German. B.A., Univ. of California at Santa Barbara, 1982; M.A., Princeton Univ., 1985; Ph.D., ibid., 1988. (1998)
ALBERT K. WIMMER, Director of Graduate Studies and Associate Professor. B.A., Univ. of Munich: M.A., Univ. of Notre Dame, 1964; M.A., ibid., 1967; Ph.D., Indiana Univ., 1975. (1964)
History

Chair:
Thomas A. Kselman
Director of Graduate Studies:
Olivia Remie Constable
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Chair E-mail: tkselman@nd.edu
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The Program of Studies
The graduate programs in history permit students to deepen their knowledge and understanding of selected historical specializations and to nourish the historical perspective that marks the educated citizen. Advanced work in history may prepare students for careers in scholarship and teaching, for certain public service careers, or for careers in research.

The history programs accept only students planning to pursue the Ph.D. degree. These students are normally awarded a master’s degree in the course of pursuing their doctorates.

Admission
An applicant ordinarily should have completed at least 24 credit hours of undergraduate work in history. Although the history department grants an M.A. degree, it admits only students interested in pursuing a doctorate. Language preparation is highly desirable; prospective medievalists must know Latin, and both medievalists and those pursuing studies in other fields will be required to demonstrate proficiency in reading relevant foreign languages.

Incoming graduate students in the history programs begin studies in the fall semester. Students applying to enter in the fall should have complete dossiers (application, transcripts, writing sample, recommendations, and GRE scores—verbal, quantitative, and analytical) on file with Notre Dame’s Office of Graduate Admissions no later than the preceding January 15. The “Statement of Intent” accompanying the application should describe the student’s areas of interest as explicitly as possible and should list the departmental faculty with whom they wish to study. (Please note that professors designated “emeritus” are retired.) The writing sample should demonstrate the applicant’s skills in writing, analysis, and (if possible) historical research.

Fall applicants who wish to begin studies at Notre Dame the preceding summer should meet fall application requirements and also summer session admissions requirements stipulated in Notre Dame’s Summer Session Bulletin of Information.

General Requirements
Before completing their doctorates, students must satisfy the departmental requirements for the master’s degree. Doctoral students receive their master’s after completing 30 credit hours of study including one graduate-level seminar in history and 24 credit hours of graduate-level work (seminars, colloquia, directed readings, supplemental research, and readings) in history or related disciplines. The master’s degree demands satisfactory completion of coursework with a GPA of no less than 3.0; for students in modern European history, it also demands passage of an oral master’s examination. In order to enter the doctoral program, students must satisfy the foreign language requirement and receive the approval of the departmental faculty.

Students entering Notre Dame with a master’s degree in history from another institution normally have the same course work, writing, and examination requirements as those entering without such a degree, but holders of the master’s degree may be able to transfer as many as 24 credits into the history Ph.D. program, upon approval of the director of graduate studies.

In order to receive a Ph.D., a student must complete a total of 72 credit hours of study, including at least three graduate-level seminars in history (two for students in American history). Work must be in graduate-level courses (seminars, colloquia, directed readings, supplemental research and reading, dissertation research) in history or related disciplines.

In addition to completing prescribed course work, doctoral students must also pass Ph.D. candidacy examinations in their specialties. The candidacy examination will normally be taken sometime in the student’s third year of residence. Students wishing to take candidacy examinations earlier than the third year of residence may do so with the consent of their academic advisers and the director of graduate studies. To be eligible to take the candidacy examination, students must satisfy the foreign language requirement and complete the required course work in their specialization.

Before being advanced to Ph.D. candidacy, students must submit to the department an approved dissertation proposal (see procedures outlined below). Within eight years of enrollment into the history graduate program, students must complete a satisfactory doctoral dissertation or risk the loss of their candidacy status. A student may appeal to the Graduate School for extension of candidacy status; granting of extensions may occur for compelling reasons but in no case may that candidacy be extended beyond seven years following passage of the candidacy examination.

Language Requirement
One basic requirement for all candidates for the doctorate in history is a reading knowledge of one modern foreign language. In each field additional languages or an appropriate skill are prescribed as the faculty in that field consider necessary. The following provisions are in force. Candidates in the field of medieval history must demonstrate competence in Latin and two modern foreign languages, one of which must be French or German. Competence in Latin is demonstrated by a student’s passing the examination in medieval Latin administered by the Medieval Institute. Candidates in continental European history must demonstrate competence in reading two foreign languages, one of which must be French or German. Candidates in American history must demonstrate competence in one modern foreign language. Language and skill requirements must have been completed by the student before the student will be permitted to take general Ph.D. examinations.

To receive the M.A., doctoral students must demonstrate a reading knowledge of one modern foreign language. Students must demonstrate their knowledge of this language by the end of their third semester in residence.

Examinations
Master’s examinations in modern European history are oral examinations administered near the end of the student’s second semester of residence. The master’s examination board will consist, whenever possible, of three faculty members who have worked with the student during the year. Each faculty member may pose questions based on student course work during the year. The master’s examination must be no less than 90 minutes and no more than two hours in length.

Students in American history will normally
take their master’s examination at the same
time that they take the written part of their
Ph.D. candidacy examinations. In order to
receive the master’s degree earlier, a student,
upon completion of at least a year of course
work, may take and must pass a written
two-hour examination, administered by
three history professors, normally with
whom the student has taken course work.
Students in medieval history follow the
same procedures as their Americanist
counterparts.

Ph.D. candidacy boards will consist of four
or five faculty members named by the
director of graduate studies. The written
exam shall consist of four or five two-hour
equizzes on topics selected by the examination
board within fields chosen by the student;
the oral exam shall involve questioning by
the board for not less than 90 minutes and
not more than three hours.

Students who fail a Ph.D. candidacy
examination may appeal to the director of
graduate studies to retake the failed portion
one time.

Advancement to Candidacy for the Ph.D.
While preparing for the Ph.D. candidacy
examinations, all students should take a
one-semester directed reading course with
their academic adviser on a prospective
dissertation topic. After successfully passing
the written and oral candidacy exam, the
student will consult with the director of
graduate studies about a thesis director and
other members of a dissertation committee.
The director of graduate studies, after
consulting with those colleagues, will create
that committee. The student will then
present a dissertation proposal to the
committee. The proposal should include a
statement of the subject to be addressed; a
survey of the relevant sources, where they
are located, and how the student expects to
get to them; how this dissertation would
contribute significantly to knowledge in the
field; what languages or quantitative skills
are required and how the student proposes
to gain them; and the timetable and
financial resources required. The committee
can accept, reject, or modify the proposal.
If and when a proposal is accepted, the
committee will notify the director of
graduate studies who will, in turn, nominate
the student to the Graduate School as a
Ph.D. candidate.

Writing and Defense of the Dissertation
After advancement to Ph.D. candidacy,
students must complete a doctoral disserta-
tion, which the department understands to
be a substantial piece of research based on
primary sources that makes an original
contribution to historical knowledge.
Departmental procedures for approval of
the dissertation are as follows:
1. The dissertation must be read and
approved by the student’s adviser.
2. The student then furnishes the depart-
ment with three copies of the thesis. These
copies are to be read and approved within
30 days by three readers from the graduate
faculty. Students are responsible for
incorporating into the dissertation whatever
changes the readers find necessary. At this
time, the student submits a complete copy
of the dissertation to the Graduate School
for a preliminary formatting review.
3. Normally the student defends the
dissertation by delivering a lecture that
any member of the graduate faculty
may attend. The academic adviser, three
readers, and an outside chair appointed by
the Graduate School must also attend. After
the lecture and a period for questions and
discussion, the committee must vote as to
whether the dissertation defense has been
satisfactory.
4. Two clean, corrected, unbound copies
of the dissertation must be delivered to the
Graduate School by the appropriate due
date.

Distribution Fields
Students in American and modern Euro-
popan history will be required to take Ph.D.
candidacy examinations in four or five
fields, at least three of which will be in their
major area of concentration (e.g., American
or modern European). One of the fields
choosen must be from an area other than that
of the student’s area of concentration. It
might be taken either within the history
department, or from another department
(e.g., government or theology).

Students in medieval history will be
required to take examinations in four or five
fields. These fields must include one
medieval chronological field, one medieval
subject field, one field specifically focused
on the area of the dissertation, and one
outside field.

The following fields serve as guidelines. A
field might be modified after appropriate
consultation between a faculty examiner
and student. Additional fields might be
arranged by a student with faculty members
with the approval of the director of graduate
studies.

United States
Colonial/Revolutionary (1600 to 1800)
National Period/Civil War and
Reconstruction (1800 to 1877)
Gilded Age/Progressive Era
(1877 to 1920)
Recent America (1920 to the present)
History of American Religion
American Intellectual History
U.S. Diplomatic History
African American History
Native American History
Women’s History/Gender
History of Science and Technology

Modern European
Renaissance/Reformation/
Counter Reformation
England (17th and 18th centuries)
England (19th and 20th centuries)
Ireland (18th to 20th century)
France (1789 to 1914)
Germany and Austria (1815 to 1914)
Germany and Austria (1914 to the present)
East-Central Europe (19th and
20th centuries)
Russia (19th century)
Russia and Soviet Union (20th century)
European Intellectual History (19th and
20th centuries)
European Social History (19th and
20th centuries)
European Religious History (19th and
20th centuries)
European Diplomatic History (19th and
20th centuries)

Medieval
Early Middle Ages (500 to 1050)
High Middle Ages (1050 to 1300)
Later Middle Ages (1300 to 1500)
Medieval Social and Economic History
Medieval Intellectual and Cultural History
Medieval Ecclesiastical and
Religious History
Medieval Islam
Medieval Judaism
History of Science
History of Gender
Dissertation field (required)

Other
Latin America
Modern East Asia (China and Japan)
Africa

Specialization
The department offers three fields of study:
United States History, Medieval History,
and Modern European History. Incoming
students must select one of these fields at the time of admission. The faculty prescribes course requirements in each field. In the first year of study a student must write a substantial original paper, which will figure in the department’s screening of the student for the Ph.D. program. At present the following requirements exist:

A. United States History
By the time a student takes the Ph.D. candidacy examination, the student should have completed the following:
1. At least six graduate-level colloquia/directed readings in United States history. The colloquia must include a one-semester introduction to historical methods to be taken in the first semester of residence and the following three courses: America to 1790, U.S. 1790 to 1890, and U.S. Since 1890.
2. A minimum of two colloquia in fields of history other than United States history.
3. At least two research seminars, one of which must be taken in the first year.

B. Medieval History
The requirements for medieval specialists are as follows:
1. Students must take a total of eight graduate colloquia/directed readings courses plus three research seminars, one of which must be taken in the first year. The colloquia/directed readings must include two proseminars in medieval history and a two-semester sequence in paleography and diplomatics.
2. First-year students must also take at least one course with extensive reading in Latin sources, and the two-semester Introduction to Medieval Studies.

C. Modern European History
Course requirements for modern Europeanists are as follows:
1. Before taking their candidacy examinations, students must take a total of three research seminars and at least eight other graduate colloquia/directed readings courses. As many as two of the colloquia/directed readings courses may be taken outside the History department.
2. First-year students must complete at least one seminar using sources in a modern European language other than English. First-year students must also take whatever prescribed introductory courses in their chosen field the department may offer that year.

Concentration in Religious History
There is no formal degree program in religious history; however, students may choose religious history as an area of concentration while fulfilling the normal requirements of one of the three degree fields. Requirements for a religious history concentration are as follows:
1. Completion of graduate-level courses in two distinct fields of religious history (for example, medieval and modern European).
2. Compilation of a reading list on religious history with the assistance of a faculty member in the student’s specialization. This reading list would serve as a basis of questioning on one portion of the doctoral examination.

Once accepted in the doctoral program, students will write dissertations in their respective areas of specialization, but the topics they choose may be in religious history.

Financial Aid and Other Information
Financial aid is allocated to the department by the University each spring. A portion of this aid is available for incoming first-year graduate students and is assigned on the basis of merit after review of application dossiers. Students already in residence are assigned aid by faculty vote, after an annual general review of student performance. All available aid is reassigned annually for the term of one academic year. Students whose performance falls below University minima stipulated in the general regulations of this Bulletin or who do not satisfy other published requirements for aid will have their aid withdrawn. Graduate assistantships are ordinarily reserved for students who have already completed a year of graduate work.

For general information concerning admissions procedures, course and hour requirements, grades, financial aid, procedures pertaining to graduate research, and other matters, consult the Graduate School regulations that introduce this Bulletin. Note that certain departmental degree requirements (for instance, foreign language proficiency) are more demanding than the Graduate School’s general rules. Further information concerning the history department’s graduate degree programs may be obtained by writing the University of Notre Dame, Director of Graduate Studies, Department of History, 219 O’Shaughnessy Hall, Notre Dame, IN 46556. Application forms and information concerning non-curricular aspects of graduate study at Notre Dame may be obtained by writing the University of Notre Dame, Graduate Admissions, 502 Main Building, Notre Dame, IN 46556.
531–539. Courses in American History
(3-0-3) Staff
Variable themes in the history of the Americas. (Occasional)

541–549, 588. Variable Courses in Medieval History
(3-0-3) Medieval History Staff

551. Readings in African American History
(3-0-3) Pierce

554, 568, 569, 570, 574. Courses in United States History
(3-0-3) U.S. History Staff
Variable themes in United States history. (Occasional)

566. History of Modern Astronomy
(3-0-3) Crowe
This course will treat a number of topics in the history of astronomy in the period from 1700 to the present. Half the course will be devoted to the development and galactic and extragalactic astronomy from the creation of the “island universe” theory in the 18th century to the expanding universe theory of the present century. Another topic that will definitely be treated, although on a more limited scale, is ideas of extraterrestrial life. Other areas that may be included are the rise of astrophysics, planetary discoveries from Uranus to Pluto, astronomical instruments and observatories, radio astronomy, American astronomy, and Southern Hemisphere astronomy. Special attention will be given to philosophically and religiously significant aspects of the history of astronomy. Persons interested in philosophy of science, history of science, astronomy, physics, or the relations of astronomy to religion and literature may find this course of value. No specific background is assumed. Instructor’s permission required for undergraduates wishing to enroll.

597. Directed Readings
(3-0-3) Staff
Independent study of special topics under the direction of a faculty member. Agreement by the faculty member and approval by the director of graduate studies required. (Annual)

The Seminar Series
Graduate work culminates in the production of original scholarship. Seminars ordinarily are offered each semester in United States, modern European, and medieval history. All doctoral students must successfully complete at least three history seminars. Specific themes, topics, and/or periods addressed by each seminar are determined from semester to semester by participating faculty and by student needs. Seminars frequently build upon work done in related colloquia. Seminars in medieval, modern European, and United States history are listed according to the following numbering scheme. Occasional seminars in other fields are suitable for Ph.D. “minor” course work. Seminars are all (3-0-3) and taught by the staff.

The Colloquium Series
The bulk of elective graduate course work in history at Notre Dame is accomplished in colloquia. Colloquia provide intensive reviews of the substance and bibliography pertinent to various historical periods, regions, topics, and/or themes. They comprise readings in, reports on, and discussion of the scholarly literature, classic historiographical issues, interpretive trends, methods, etc. Many colloquia are scheduled according to a repeating cycle; a few occur frequently and others are taught occasionally. Some colloquia are followed by related seminars. In some cases, a professor will permit a student to write a research paper (equal to a seminar paper) in the context of the colloquium.

601. Medieval Research Seminar
(3-0-3) Staff

602. Canon Law in High Middle Ages
(3-0-3) Van Engen

604. History in the Contact Zone
(3-0-3) Biddick

605. Commercial Revolution of the Middle Ages
(3-0-3) Constable

606. Medieval Cities
(3-0-3) Constable

609. Merovingian Franks 450-750
(3-0-3) Noble

617. History of Conservative Thought
(3-0-3) Sullivan

623. Early Modern Europe
(3-0-3) Louthan

625. Hildegarde of Bingen
(3-0-3) Van Engen

626. Devotion and Dissent in the late Middle Ages
(3-0-3) Van Engen

634. Protestant and Catholic Reformation
(3-0-3) Louthan

636. Gender in Modern European History
(3-0-3) Bergen

637. Europe between the Two World Wars
(3-0-3) Bergen

639. Seminar: Fin de Siècle Europe
(3-0-3) Wegs

640. Soviet Russia
(3-0-3) Hamburg

641. Sources and Resources in Polish History
(3-0-3) Crago

642. Sources and Resources for Irish History
(3-0-3) Whelan

643. Religion and Society in Europe
(3-0-3) Kselman

644. Religious Conversion as a Historical Problem
(3-0-3) Kselman

645. Historiography: Problem of Evil
(3-0-3) Bergen

646. Nineteenth and Twentieth Century European Intellectual History
(3-0-3) Whelan

647. Cultures in Contact
(3-0-3) Constable

648. Late Imperial Russia
(3-0-3) Hamburg

650. Problems and Themes in History of Technology
(3-0-3) Hamlin

651. Late Medieval Reform Councils
(3-0-3) Van Engen

653. Seminar: Church and Society Around 1200
(3-0-3) Van Engen

658. American Cultural History, 1895 to Present
(3-0-3) Bederman

663. Seminar: American Puritan Thought and Culture
(3-0-3) Marsden

664. Seminar: Comparative Religious Fundamentalisms
(3-0-3) Appleby
665. Seminar/Colloquia: American Evangelicalism and Fundamentalism (3-0-3) Marsden

667. Christianity, Thought, and Culture in the US (3-0-3) Marsden

668. Colloquium in Anglo-American Intellectual History I (3-0-3) Turner

669. Colloquium in Anglo-American Intellectual History II (3-0-3) Marsden

670. Seminar in Anglo-American Intellectual History (3-0-3) Turner

**Doctoral Program Service Courses**

690. Supplemental Research and Reading (0-3-3) Staff
Independent study under the direction of the student's graduate advisor. May be taken each semester.

695. Candidacy Semester Readings (V-V-V) Staff
A special reading course in which the student may enroll only in the semester in which he or she takes the Ph.D. candidacy examination. It permits the student to devote full time to preparation for the examination and, after its completion, to write a dissertation proposal. Regular graduate course work may also be pursued during the candidacy semester. (Annual)

696. Examination Preparation (V-V-V) Staff

697. Directed Readings (0-3-3) Staff
Independent study of special topics under direction of a faculty member. Agreement by the faculty member and approval by the director of graduate studies required. (Annual)

699. Research and Dissertations (V-V-V) Staff
Individual conferences and consultation between the doctoral student writing the dissertation and the dissertation director. Required of students pursuing dissertation research in residence. (Annual)

700. Nonresident Dissertation Research (0-0-1) Staff
Continuing registration for the doctoral beyond 72 credits; required of students not in residence. (Annual)

701. Graduate Teaching Practicum (3-0-3) Director of Graduate Studies
Study, discussion, and exercises in teaching history. Required of students in their first year of graduate assistantship regardless of years in residence; optional for other graduate students. (Annual)

**Additional Courses**

1. Doctoral students are automatically authorized to enroll for nine graduate credits (500- or 600-level) in ancillary or "minor" courses offered by other graduate departments in the divisions of humanities and social sciences.

2. Doctoral students may enroll for graduate credit in other divisions and schools of the University in accordance with University regulations and with prior approval of the director of graduate studies.

3. All graduate students may earn degree credit during the Notre Dame summer session, in accordance with provisions of the current Summer Session Bulletin of Information.

4. Graduate students may take up to two 400-level history lecture courses for degree credit.

**Faculty**


Doris Bergen, Associate Professor (on leave fall 2001). B.A., Univ. of Saskatchewan, 1982; M.A., Univ. of Alberta, 1984; Ph.D., Univ. of North Carolina, Chapel Hill, 1991. (1996)


Paul Cobb, Assistant Professor. B.A., Univ. of Massachusetts, 1989; M.A., Univ. of Chicago, 1991; Ph.D., ibid., 1997. (1999)


Vincent P. DeSantis, Professor Emeritus. B.S., West Chester Univ., 1941; Ph.D., Johns Hopkins Univ., 1952. (1949)


Philip Gleason, Professor Emeritus. B.S., Univ. of Dayton, 1951; M.A., Univ. of Notre Dame, 1955; Ph.D., ibid., 1960. (1959)


Iván A. Jaksic, Professor. B.A., Univ. de Chile, 1975; M.A., State Univ. of New York
The Program of Studies

The Program in the History and Philosophy of Science (HPS) at the University of Notre Dame is one of a handful of programs in the United States that offers graduate-level instruction up to the Ph.D. in the field of the history and philosophy of science. The organization of the Notre Dame HPS program is that of an interdepartmental “committee,” leading to a degree satisfying a combination of requirements determined jointly by the HPS program and the relevant disciplinary departmental graduate program, either philosophy or history.

Because the Ph.D. in HPS incorporates the requirements for a doctorate in a standard disciplinary department, the HPS degree program leads to a doctoral degree inclusive of, but broader in scope than, the departmental degree. For this reason it is defined as a five-year program, rather than the normal four. Thus students who take the doctoral degree in the HPS program can claim to have satisfied both the disciplinary degree requirements and also those of an HPS degree. This allows Notre Dame graduates to situate their work within traditional disciplinary contexts and enables them to qualify for academic positions in regular disciplinary departments.

All designated HPS faculty members with appointments to the graduate faculty may serve as graduate student advisers, take part in examination committees, and act as the primary directors of dissertation research.

Courses are offered over a wide range of topics in the history of science, from medieval natural philosophy to the physics, biology, medicine, and technology of the 19th and 20th centuries. Particular emphases can be pursued in medieval natural philosophy and medicine, the Scientific Revolution of the 17th century, the history of astronomy, physics, and mathematics, 19th-century European and American science, technology and medicine, the history and philosophy of economic thought, and the history of life and physical science in the 20th century.
Course work in the philosophy of science draws upon the resources of the University’s departmental strengths in philosophy of science, ethics, the history of philosophy, and analytic philosophy. The field itself tends to divide into four parts, all of which are dealt with at Notre Dame. The first is concerned with such themes as explanation, theory-evaluation, theory-change and rationality, and recent continental approaches to the philosophy of science. The second considers the philosophical issues raised by developments in specific fields of science, such as quantum mechanics, relativity, space and time, evolutionary biology, cognitive neuroscience, sociology of scientific knowledge, and the methodology of economics. The third concerns the history of the philosophy of science. The fourth considers the ethics of science and technology. The program offers a broad covering in its courses and seminars in more specialized topics.

An important feature of the program is its attention to the broader relationships between science and culture; science, technology, and values; and the interrelations of science and religion. The ability to conduct historical and philosophical examination of these issues in the Notre Dame program forms an important feature of the course of instruction.

Through a regular faculty-student reading and discussion seminar held each semester, coupled with a visiting speaker series, the discussions of the broad range of current issues in the history, sociology, and philosophy of science are actively pursued by the combined group.

The program draws upon the resources of three important research centers at the University of Notre Dame: the Reilly Center for Science, Technology, and Values; the Center for Philosophy of Religion; and the Medieval Institute, all of which organize regular seminars, speaker series, and major conferences on current topics.

Admissions
There are no “standard” requirements for students entering a field as diverse as history and philosophy of science. Ideally students will have had dual training in a relevant humanistic academic discipline and in some area of science. The extent of the background preparation in a science expected of a student will depend on the area of doctoral research chosen. Someone who elects to specialize in ancient or medieval natural philosophy will require other special skills (in language, for example) but need not have the kind of competence in a science expected of a student intent on studying the philosophy of quantum mechanics. Sufficient preparation is expected in a humanistic discipline, typically history or philosophy, to permit the disciplinary department to make a judgment concerning admission at the time of application. Admission to the doctoral program thus requires a joint admission decision by the HPS program and the disciplinary department.

Since financial support is given by the HPS program, initial application materials should be directed to HPS and not to the disciplinary department unless an applicant wishes to be considered independently for admission to some other program of the University.

Financial Aid
The Notre Dame program offers a limited number of fellowship-assistantships to entering students each year that include full-tuition scholarships. These provide a duty-free fellowship for the first year, with services expected for stipend continuation in the second, third, and fourth years. A fifth-year dissertation fellowship is awarded to students making satisfactory progress toward the degree. Duties will normally include teaching assistantship work in the selected disciplinary department (history or philosophy); in the undergraduate Science, Technology, and Values concentration; or in the undergraduate Program of Liberal Studies.

Applicants are urged to apply for the competitive NSF and Andrew Mellon predoctoral fellowships in the history and philosophy of science. Deadlines for these applications are in November of the year preceding admission but may also be applied for in the first year of the program.

Master’s Program
Because HPS is a doctoral program, applicants interested only in receiving a terminal M.A. degree will not be accepted. However, this rule does not apply to individuals concurrently enrolled in other doctoral graduate programs of the University who seek to earn a nonresearch HPS master’s degree in order to complement their doctoral studies. Students whose primary enrollment is in HPS will be entitled to receive a master’s degree once they have completed the written and oral examination for Ph.D. candidacy. In addition, in the event that an admitted HPS student decides to leave the program or is subsequently discontinued by the HPS program or the disciplinary department, the student may pursue a research (or thesis) terminal M.A. degree.

The nonresearch HPS M.A. degree requires the completion of 36 credit hours of course work. Three courses in history of science and three courses in philosophy of science form the core of this requirement. The student, in consultation with the HPS program director, selects the remaining courses. To be eligible for HPS credit, these courses must bear in significant ways on the concerns of history and philosophy of science. Students taking the nonresearch HPS M.A. concurrently with a Ph.D. in another Notre Dame program may count up to nine hours of course work toward both degree programs, subject to approval by the director of HPS and the DGS in the other program. Reading knowledge in one foreign language (ordinarily French or German) will be required. A one-hour oral examination, based on course work, will complete the requirements for the nonresearch degree. Students taking the terminal HPS research M.A. will prepare an extended research paper or formal M.A. thesis under the direction of a faculty member, for which six hours of thesis credit will be awarded. A one-hour oral comprehensive examination completes the requirements for this research M.A. degree.

Doctoral Program
HPS students pursue the Ph.D. degree in either a philosophy track or a history track.

Philosophy Track
Those who elect the philosophy track toward the Ph.D. in history and philosophy of science must satisfy the following course distribution requirements. In HPS, they will take a minimum of three courses in the general area of philosophy of science and four courses in history of science, plus the HPS 560 Proseminar. Courses in the history of science will be selected from offerings designated as satisfying the examination fields for the history of science M.A. comprehensive. In addition, students will satisfy a slightly modified form of the philosophy graduate program’s require-
ments, namely, the philosophy proseminar and a minimum of one course in each of the following areas: logic, history of ancient philosophy, history of medieval philosophy or science, and history of modern philosophy, and in two of the following three areas: ethics, metaphysics, and epistemology. Students may also be advised to take some extra work in one of the sciences, if this seems necessary for the specialized research they are planning. The language requirement for Ph.D. candidates in the philosophy track is a reading knowledge of two foreign languages.

**Ethics of Science and Technology Concentration.**

Students on the philosophy track who elect the ethics of science and technology concentration will satisfy the philosophy-track course requirements, but with the following exceptions: (1) the student will take at least four courses in ethics or science and ethics; (2) PHI 569 (20th Century Ethics) will be taken as one of the three required philosophy core courses; (3) one of the four required history of science courses will be selected from a specified list of courses in the area of science, technology, and values; and (4) an additional course in ethics will be chosen from a specified list of philosophy courses.

In late summer after his or her second year, the student will take a written qualifying examination in the history of philosophy administered by the philosophy department. In the late summer after the third year, the student will take a written M.A. comprehensive examination in history of science. This will include examinations in the four following areas in the history of science: (1) ancient, medieval, and early-modern natural philosophy; (2) history of physical science 1700 to 1910; (3) history of life science 1700 to present; (4) science, technology, and society (including history of medicine and technology). This will replace the long paper and examination requirements normally expected for certain tracks within the history department (medieval, modern European) (see history doctoral requirements). In the spring of the third year, the student will prepare for the Ph.D. candidacy examination, taken in the late summer. This will consist of two parts, written and oral. The examination board will consist of five faculty members appointed jointly by the HPS program director and the director of graduate studies in history. Each examiner will set a two-hour written examination in one of five fields, two of which will be in specialized areas in the history of science and technology, two in other history fields, and one in the philosophy of science. The oral examination will be given shortly after the written and will involve the same five examiners.

Once Ph.D. candidacy requirements have been completed, the student will begin preparation of a dissertation proposal under the guidance of a research director of his or her choice. The proposal will be presented to a thesis evaluation committee, consisting of five faculty chosen jointly by the HPS program director and the director of graduate studies in philosophy. The committee can approve, reject, or request modifications in the candidate’s proposal. When the proposal is approved, the student will work under the direction of his or her thesis director to prepare a dissertation that must be approved by the director and three readers appointed by the HPS program director. Readers are normally drawn from the committee that approved the original proposal, but one outside member of the committee may be substituted if deemed desirable for expert judgment of the dissertation. If the readers accept the dissertation, the HPS program director arranges for a dissertation defense. The defense committee is composed of at least the dissertation director, the three dissertation readers, and an outside chairperson appointed by the Graduate School. After the defense and ensuing discussion, the committee decides by majority vote whether the defense of the dissertation project has been satisfactory and determines whether any revisions of the dissertation are required as a result of weaknesses revealed in the oral defense.

**History Track**

Those who elect the history track toward the Ph.D. in history and philosophy of science will take a minimum of four courses in history of science, plus the HPS 560 Proseminar, and three courses in the general area of philosophy of science. In addition, a student will take at least eight more courses (three of which must be research seminars) in two of these fields: American, Modern European, or Medieval History. These eight courses can include the history of science and technology.

The basic language requirement for Ph.D. candidates on the history track is a reading knowledge of one modern foreign language. In addition, competence has to be shown either in a second language or in a technical discipline bearing on the student’s research work, such as one of the natural sciences.

In the late summer after the second year, the student will take a written M.A.
determines whether any revisions of the dissertation are required as a result of weaknesses revealed in the oral defense.

**Course Descriptions**

Each course listing includes:

- Course Number
- Title
- (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
- Instructor
- Course Description

The listing includes courses that were offered in the past three academic years.

500. HPS Colloquium
(1-0-1) Staff
Discussion of a prominent recent work in the field of HPS, and research presentations by visiting scholars. Required course for HPS students in the first and second years of the program. (Every semester)

521. Einstein's Philosophy of Science
(3-0-3) Howard
A survey of the historical development of Albert Einstein's philosophy of science, paying special attention to the contemporary intellectual and philosophical context. Topics covered include the influence upon Einstein of such movements or schools as Machian positivism, Marburg neo-Kantianism, conventionalism, and Vienna Circle logical empiricism, as well as Einstein's influence on the further development of the philosophy of science in the 20th century, with special emphasis on issues such as the structure and interpretation of theories and the realism-instrumentalism debate. The nature and significance of interactions between science and philosophy are also considered. Note: No background in physics or mathematics is assumed. (1998–99)

532. Leibniz, Newton and Kant's Critique
(3-0-3) Franks
A close examination of central aspects of Kant's *Critique of Pure Reason*, considered as an attempt to resolve tensions between the model of intelligibility exemplified by Newton's physics and the model of intelligibility articulated in Leibniz's metaphysics. We will investigate some conflicts between Leibniz and Newton with respect to space, time, causality, and freedom, and we will critically study both the methods adopted by Kant to resolve these conflicts (transcendental arguments) and the results supposedly achieved thereby (transcendental idealism). The *Critique* as seen from this perspective will be contrasted with the *Critique* as it is understood by some contemporary philosophers.

550. Plato's Timaeus as Cultural Icon
(3-0-3) Reydams-Schils
This course will deal with the reception of Plato's *Timaeus*, both as a hermeneutical strategy for a richer understanding of the text itself, and as a study of the process of cultural assimilation. We will use the *Timaeus* also as a window to "survey" topics, such as the history of Neoplatonism and its impact on the Medieval tradition. (1999-2000)

560. Introduction to History and Philosophy of Science
(1-0-1) Staff
An introduction to the research methods and the varied areas of specialization in the history and philosophy of science. This course also functions as an introduction to the graduate HPS program. Required of all entering HPS students. (Every fall)

565. The Scientific Revolution
(3-0-3) Crowe, Harley
This course studies selected developments in science during the period from 1500 to the death of Newton in 1727. The focus will be on such major figures as Copernicus, Kepler, Galileo, Huygens, and Newton. Philosophical, religious, and historiographical issues will receive some attention. (Satisfies core history requirement) (1999–2000)

566. History of Modern Astronomy
(3-0-3) Crowe
Traces the development of astronomy and cosmology from the late 17th century to the 1930s. Attention is given to the interactions of astronomy with other areas of science and with philosophical, religious, and social factors. (Satisfies core history requirement) (1999-2000)

568. Topics in the History of Physical Science 1600 to 1900
(3-0-3) Crowe
This course treats selected developments in the history of physical science, especially in the period from 1600 to 1900. Interactions with the main philosophical, social, and religious currents are included. (Satisfies core history requirement) (1998-1999)

569. The Darwinian Revolution
(3-0-3) Sloan
A combined historical and philosophical approach to the revolution created by the work of Charles Darwin. The course deals with the origins of Darwinism; the 19th-century debate over evolution; the subsequent development of mathematical and genetic approaches to natural selection theory; and the formulation of neosynthetic evolutionary theory. The course will close with consideration of more recent developments connected to developmental genetics, punctuated equilibrium theory, and chaos-theoretical approaches to evolution. Students will be introduced to the historical and philosophical literature of current interest. (Satisfies core history requirement) (2000-2001)

570. The Molecular Revolution in Biology
(3-0-3) Sloan
This course offers a historical and philosophical analysis of the origins and development of the molecular revolution in biology that broke into full public view in the early 1950s with dramatic discoveries of the molecular structure of DNA and the biophysical mechanism of the action potential in the nervous system. The course will approach this with an analysis of the development of the chemistry and physics of living materials from De Vries and the German biophysical school (Helmholtz), through the remarkable advances in physiology of the French school (Bernard) and the development of genetics. The course will terminate in the examination of molecular approaches in contemporary work in human genetics (the Human Genome Project). (Satisfies core history requirement) (1999-2000)

572. Science, Medicine and Social Reform, 1750 to 1950
(3-0-3) Hamlin
The development of the idea that health care is a responsibility of government, involving the interrelations of developments in the medical sciences, the social structure of the medical profession, and changing ideas about public responsibility for social welfare. Topics include Enlightenment concepts of medical policy; the public health movement; changing ideas of the hospital; developments in etiology, pathology, bacteriology, and therapeutics; and the politics and ideologies of social reform movements. (Satisfies core history requirement)

573. The Social Uses of Science, 1800 to the Present
(3-0-3) Hamlin
Considers the impact of science, both
intentional and unintentional, on society during the past two centuries. Topics include major technological applications of the biological and physical sciences, ideological uses of scientific theories and concepts, the elevation of science to the position of a central cultural norm, the growing emphasis on science in the academic curriculum, and the employment of scientific expertise in public decision making. (Satisfies core history requirement) (1998-1999)

574. Problems and Themes in the History of Technology
(3-0-3) Hamlin
Examines concerns of the modern historiography of technology. These include problems closely related to issues in the history and philosophy of science—the relation of science to technology, contexts of inventiveness, technological diffusion, relation of technology to ideology and rational reconstruction in the history of technology. Also considers problems closely related to issues of social, economic, and political history—incentives to technical change, effects of technologies, relation of technological controversy to political process, technological determinism as a historical explanation, and the place of technology in the new social history. (Satisfies core history requirement) (1998-1999)

(3-0-3) Mirowski
Examines the way the understanding of nature in both its generic and specific senses has informed the evolution of economic thought. We start with an examination of various economists who have written on the role of natural images in economics: Mill, Marx, Veblen, and Hayek. This serves as a prelude to some specific historical controversies in the history of economics, such as: the relative importance of histories of physics and biology in economics, the impact of mathematical formalization upon the content of economics, the struggle to define legitimate experimentation in economics, the response to sociobiology and psychology, and other related topics.

577. History of Economic Thought
(3-0-3) Mirowski, Sent
This is a course that intends to ask how it is that we have arrived at this curious configuration of doctrines called “economics”; and more importantly, how differing modes of historical discourse tend to ratify us in our prejudices about our own involvement in this curious project. A basic knowledge of economics (including introductory economics and preferably intermediate economics) will be presumed. (1999-2000)

578. Philosophy and the Human Sciences
(3-0-3) Bordogna
This course examines the complex and multifaceted process that resulted in the clear separation of what we would now call philosophy from the human sciences. That process included the transformation and emergence of a number of more specific fields, including psychology, anthropology, and sociology, from a more general realm of largely philosophical investigation. We will trace the history of the human sciences as they differentiated from older philosophical inquiry and defined themselves, mainly through some form of affiliation or opposition to philosophy, on the one hand, and the exact sciences, on the other. Particular emphasis will be placed on late-nineteenth-century debates about epistemological and methodological issues, and their interconnection to debates concerning the institutional and academic location of the human sciences. (1999-2000)

579. Colloquium in Anglo-American Intellectual History
(3-0-3) Turner
A readings course in selected topics in Anglo-American intellectual history from the late 17th century through the late 19th century. “Anglo-American,” as used here, comprises those discourses common to Britain and anglophone North America. This does not preclude occasional French or German voices. Examples might include sensationalist psychology, evangelical Calvinism, Newtonian physics, republicanism, Scottish common-sense philosophy, liberalism, and Darwinism.

581. Philosophy of Science
(3-0-3) Howard, McKim
A survey of major problems, movements, and thinkers in 20th-century philosophy of science. The course begins with a look at the historical background to logical empiricism, its rise to prominence, and its early critics, such as Popper. After a study of major problems in the neo-positivist tradition, such as confirmation, explanation, and reductionism, we will pause to note as well a few major problems in the foundations of the special sciences, including indeterminacy and complementarity in quantum mechanics, and the conventionality of the metric in relativity theory. Historicist critiques of neo-positivism, chiefly Kuhn’s, will be studied next, followed by a consideration of the realism-instrumentalism debate. The course concludes with a brief look at new perspectives, such as social constructivism and feminist philosophy of science. (Satisfies core philosophy requirement) (Every fall)

582. Explanation, Causation, and Scientific Laws
(3-0-3) McKim
Can there be causal relatedness without laws? Are scientific explanations always causal? Are there really any laws of nature? How could we know? The triad of concepts mentioned in the course title are deeply rooted in scientific practice and have provided central themes for philosophical reflection about science and the world science seeks to understand. Yet each remains highly controversial. This course explores some of the best current thinking about how these notions and their interrelationships should be understood. (1997–1998)

583. Philosophy of Biology
(3-0-3) Moss
An examination of major problems in the philosophy of biology and recent work on those problems. The course begins with a comparison between traditional “biological philosophy” and “philosophy of biology” proper, an expression that emerged in the 1970s in the context of Anglo-American philosophy of science. A significant array of issues and key figures in this modern subdiscipline will be presented critically, more particularly: (1) The problem of the autonomy (vs. provincialism) of biological sciences and the related debates over physical-chemical reductionism and teleology. (2) Problems raised by specific biological theories and concepts: systematics, cell theory, evolutionary theory, and genetics. These theories will be examined from three points of view: their claim to unify the biological sciences, their structure and explanatory power, and the specific problems of definition raised by certain theoretical concepts (concepts of the cell, of selection and fitness, of species, of categories and taxa, of the gene). (3) Two problems in the epistemology of medicine will be analyzed: definitions of disease and notion of a ‘cause’ of a disease. (4) Finally two ethical problems involving major epistemological issues will be discussed: eugenics and race. (1998-1999)
584. Philosophy of Social Science (3-0-3) McKim
An inquiry into the central forms of explanation employed in the social sciences: rational choice, intentional, functional, structural, and interpretive. One emphasis will be on understanding the ways in which these approaches conform to or differ from explanatory strategies in the natural sciences. A second emphasis will be on the microfoundations of social theory: What assumptions about human nature and social life are presupposed in adopting a particular explanatory strategy? (1998-1999)

585. Feminist Philosophy of Science (3-0-3) Kourany
In recent years feminists have offered rather sharp critiques of modern Western science: for example, that it has been controlled by men right from the start, with women excluded from its most important activities; that it has sought from the start to dominate nature with a method characterized by such so-called masculine traits as disinterestedness, and emotional detachment, and (at least in recent times) aggressiveness and competitiveness; and that it has tended to leave women largely invisible in its knowledge and research, or portrayed in negative terms, and has thereby justified such things as inferior educational and athletic opportunities for women, inferior medical treatment for women, and inferior positions for women in the workplace, the family, and every institution of human life. At the same time, feminists have drawn our attention to a number of recent cases of scientific research that they have considered exemplary—not subject to the above kinds of critique, and indeed, pointing us toward a much better (more useful, more objective, truer, etc.) science, and they have put forward various theories to explain and justify such an evaluation. In this course we shall explore this terrain of so-called “feminist philosophy of science”—these critiques and cases of exemplary scientific research and justificatory theories—paying particular attention to articulating and assessing the theories. We shall also explore the relation between this feminist philosophy of science and so-called “mainstream philosophy of science.” Such exploration will lead us to an interesting vantage point from which to reflect on what philosophy of science (neither “feminist” nor “mainstream”) can and should be like. (1998-1999)

586. Philosophical Problems in Physics (3-0-3) Cushing
This is a course for graduate students in the history and/or philosophy of science who are not specializing in foundational problems in physics but who wish to examine in some reasonable detail a selection of fundamental philosophical issues associated with major technical advances in the history of physics, beginning from Galileo and Newton, and ending with quantum mechanics.

587. History of the Philosophy of Science up to 1750 (3-0-3) McMullin
The classical authors in theory of science: Plato, Aristotle, Bacon, Descartes, Locke, Newton, and Hume. The connections between epistemology and theory of science will be emphasized. (Satisfies core philosophy of science requirement)

588. History of the Philosophy of Science 1750 to 1900 (3-0-3) McMullin, Howard
The second half of the history of “classical” philosophy of science. Themes: the epistemic status of scientific knowledge-claims; the presuppositions, techniques, and modes of inference appropriate to natural science; the ontological status of scientific constructs. We shall begin with Reid and Kant, go on to Comte, Whewell and Mill, and end with Mach and Poincaré. (Satisfies core philosophy of science requirement) (1999-2000)

589. Science and Religion (3-0-3) Ashley
Science and religion are complex phenomena that can be analyzed in terms (at least) of their epistemological, existential, and social dimensions. Both science and religion generate justified beliefs. The criteria and spheres of justification for these beliefs overlap and interrelate in extremely complicated ways that have led both to conflict and to mutual enrichment. This is an upper-division undergraduate- or introductory graduate-level review of these complicated interrelations. There will be two major divisions to the course. In the first we will take up methodological issues, considering different approaches to correlating science and religion. In the second part of the course we will deal in depth with the correlations between scientific cosmologies and Christian doctrines of creation and God’s providential governance of creation. (1999-2000)

590. Economics and Philosophy (3-0-3) Mirowski, Sent
Covers a range of discrete topics located at the intersection of philosophy and economics, including: how economists have reacted to the evolution of the philosophy of science in the 20th century; how conceptions of the natural and the social shape their beliefs; the role and content of mathematical discourse in economics; implications of different theories of probability for both theoretical and empirical (econometric) practice; the recent attempt to reclaim ground from moral and political philosophy; and the looming importance of cognitive science and artificial intelligence.

591. Methodological Issues in Economics (3-0-3) Mirowski, Sent
Contemporary work in the philosophy of science on issues such as explanation, verification, and prediction is employed in the critical examination of economic theorizing in the neoclassical, Keynesian, and Marxist traditions. (1997-1998)

592. Topics in Economic Theory (3-0-3) Mirowski
This course will analyze the promises and problems of alternative economic theories of the behavior of scientists and comparisons of science to a market. It will provide a comprehensive survey of the existing literature and then review the capacity of economic language and theories to elucidate the structures of science. It will further open up an inquiry into the effect of economics upon the actual conduct and content of science. Particular topics that will be covered are: the intellectual history of theories of an economics of science, evolving formats of university/government and university/industry relations, labor economics views on science, the economics of the dissemination and validation of findings, the conception that science is a public good, the economics of fraud in science, the causes and consequences of the division of labor in science, and the economics of intellectual property rights.

599. Thesis Direction (V-V-V) Staff
Research and writing on an approved subject under the direction of a faculty member.

600. Nonresident Thesis Research (0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.
674. The Question of Laws in Scientific and Ethical Thought
(3-0-3) Joy
The concept of laws of nature in modern science not only shapes our thinking about nature, but also structures important inquiries in ethics and metaphysics. But ever since Newton, the concept of laws of nature has been defined in radically different ways, and the very existence of such laws has been questioned. This seminar will begin by considering several influential accounts of laws of nature, including earlier treatments (those of Newton, Hume, Kant) and 20th-century treatments (those of Lewis, Armstrong, and critics of laws, Cartwright and Van Fraassen). It will then investigate what issues are at stake in a commitment to the coherence and existence of laws of nature. These issues concern the scientific study of nature, ethical inquiry regarding moral responsibility, and the metaphysical disagreements about the compatibility of human freedom and causal determinism.

680. Scientific Realism and Anti-Realism
(3-0-3) McMullin
The controversy regarding scientific realism has been one of the two or three focal issues in the philosophy of science over recent decades. After a brief look at the historical origins of the controversy in early astronomy and in Newtonian mechanics, we shall go on to examine the criticisms, defenses, and explications of realism in the writings of van Fraassen, Laudan, Putnam, Boyd, Hacking, and others. (1999-2000)

684. Philosophy of Cognitive Science
(3-0-3) Ramsey
In this course, we will begin by examining the philosophical underpinnings of cognitive science. We will then look at some of the implications of cognitive research for a number of traditional philosophical issues and debates. Questions to be addressed include: Is the mind separate from the brain? Could we ever make a machine that feels pain? Are humans systematically irrational? Do we have innate knowledge?

685. Continental Philosophy of Science
(3-0-3) Gutting
A survey of recent French and German work in philosophy of science. Figures discussed might include Bachelard, Canguilhem, Foucault, and Habermas.

686. Philosophy of Space and Time
(3-0-3) Howard
This seminar will address several of the more important contemporary problems in the philosophy of space and time, both from the point of view of conceptual problems in the foundations of physics and from the point of view of systematic metaphysics and epistemology. The seminar will start with a nontechnical, but rigorous introduction to current physical conceptions of space and time (both special and general relativity). We will then turn our attention to various specific topics, such as: conventionalism and the structure of spacetime; the “hole” argument in general relativity; causality and spacetime; spacetime substantivalism; space, time, and individuation; temporal becoming; black holes and spacetime singularities.

687. Interpretive Problems in Quantum Mechanics
(3-0-3) Cushing
Intended for graduate students in physics and in the history and/or philosophy of science who wish to examine in some reasonable detail the roots, both historical and philosophical, of quantum mechanics and the profound conceptual problems to which that theory has given rise. The main vehicle for this will be a study of original seminal papers in the field (e.g., those of Planck, Bohr, Heisenberg, Schrödinger, Born, Einstein, Podolsky, Rosen, von Neumann, Bell, Bohm) and of related papers in the foundations of physics literature. Some background in physics, especially in the formalism of quantum mechanics, is desirable. However, the relevant physics and philosophy will be presented in the course itself.

697. Directed Readings
(V-0-V) Staff
Readings and discussion of chosen texts under the personal supervision of a member of the faculty.

699. Research and Dissertation
(V-V-V) Staff
Independent research and writing on an approved subject under the direction of a faculty member.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

Faculty
J. MATTHEW ASHLEY, Associate Professor, Theology. B.S., St. Louis Univ., 1982; M.T.S., Weston School of Theology, 1988; Ph.D., Univ. of Chicago, Divinity School, 1993.

FRANCESCA MARIA BORDOGNA, Assistant Professor in the Program of Liberal Studies. Laurea Univ. degli Studi di Milano, 1989; Ph.D., Univ. of Chicago, 1998.


JAMES T. CUSHING, Professor of Physics. B.S., Loyola Univ., 1959; M.S., Northwestern Univ., 1960; Ph.D., State Univ. of Iowa, 1963.


A. EDWARD MANIER, Professor of Philosophy. B.S., Univ. of Notre Dame, 1953; A.M., St. Louis Univ., 1956; Ph.D., ibid., 1961.

VAUGHN R. MCMULLIN, John Cardinal O’Hara Professor Emeritus of Philosophy. B.Sc., National Univ. of Ireland, 1945; B.D., Maynooth College, 1948; Ph.D., Univ. of Louvain, 1954.

PHILIP E. MIROWSKI, Carl E. Koch Faculty
linguistic preparation.

The institute’s library contains nearly 90,000 volumes and various collections of pamphlets, reprints, and photographic materials. The reference collection contains major primary source collections, bibliographic and reference materials, catalogs, journals, and indexes.

The institute’s library has long held extensive collections relevant to the Latin culture of the Middle Ages. Holdings in the history of medieval education are unrivaled in North America. Recently, the institute has enlarged its focus to include vernacular and Latin literatures, musicology, liturgy, medieval Judaism and Islam, and art history. Microfilms of more than 3,000 medieval manuscripts from European libraries and a collection of more than 200 facsimiles of medieval seals supplement this collection. Over the years the institute has accumulated a valuable collection of medieval manuscripts, incunabula, and other manuscripts, and rare books that are preserved in the Department of Special Collections. Also found there is the John Augustus Zahm, C.S.C., Dante Collection containing early and rare editions and an extensive and valuable set of literary studies of the Divine Comedy from the 19th and early 20th centuries.

What sets Notre Dame’s institute apart is its convenient gathering in one place of most of the printed materials essential to medieval studies. The Reading Room holds major dictionaries, bibliographical guides, reference works, and primary source collections. The Astrik L. Gabriel Universi-
ties Collection in a separate room offers remarkable resources, both published and unpublished, for the history of medieval universities. Another room, equipped with faculty and study carrels, holds a large collection of manuscript catalogs and materials pertinent to paleography, diplomatics, and early printed books.

Research in the institute is also supported by the University’s Milton V. Anastos Collection in Byzantine studies, which has extraordinary holdings in the history of the Byzantine empire.

The Frank M. Folsom Ambrosiana Microfilm and Photographic Collection consists of positive and negative microfilms of the 12,000 medieval and Renaissance manuscripts held in the Biblioteca Ambrosiana in Milan. The collection also contains about 50,000 photographs and negatives of miniatures and illuminated initials from the manuscripts, supplemented by some 15,000 color slides. The Mary Davis Drawings Collection contains photographs, negatives, and color slides of the 8,000 drawings in the Ambrosiana. The institute purchases all volumes related to the Ambrosiana materials and maintains a bibliography of all citations to Ambrosiana manuscripts.

The institute regularly sponsors major conferences and hosts several guest lectures and seminars every year.

The Program of Studies

The institute admits graduate students interested in pursuing the M.M.S. and Ph.D. in an interdisciplinary program. The student must pass a Latin competency test by the fourth semester of course work and formally demonstrate a reading knowledge of two modern European languages. One should be completed before the end of the first year and the other before the end of the second year.

The Master of Medieval Studies Degree

Course Requirements

To receive the M.M.S. degree, students must take:
1. Introduction to Medieval Studies (MI 501, MI 502, each one credit hour);
2. Medieval Latin II (MI 576);
3. Paleography (MI 517);
4. one graduate-level course in medieval history, preferably one of the proseminars offered incoming graduate students in medieval history;
5. one graduate-level course in medieval literature, either the medieval vernaculars or medieval Latin, wherein the literature is read in the medieval language;
6. one graduate-level introductory course in medieval philosophy or theology; and
7. one graduate-level course in medieval music or medieval art.

Students must choose four fields from among 26 offered by the institute, master the appropriate reading lists, and pass an oral examination with four professors. Students must have completed 34 credit hours and passed the examination in medieval Latin to receive the M.M.S. degree.

The Doctoral Degree

All students, both those entering with a
B.A. and those entering with an M.A., will take the aforementioned M.M.S. program. Students with the appropriate master’s or equivalent degree may apply for credit transfer in accordance with Graduate School requirements, but also will be required to take one year of course work in the M.M.S. program. After successful completion of this additional year of course work in the M.M.S. program, students may seek admission to the doctoral program.

Students admitted to the Ph.D. program must take one additional year of course work and prepare two additional fields, one of their own choosing and one in the area of their dissertation research. The Ph.D. written examination consists of five written exams, given by professors in five chosen fields. The oral examination, which follows if at least four written exams are passed, will pursue questions in the chosen fields, and focus upon the field of the dissertation.

After successful completion of both written and oral examinations, the candidate, in consultation with the director and the student’s adviser, prepares a dissertation proposal for committee approval. The adviser and the three readers of the dissertation proposal must approve it.

**Joint Program in Medieval Philosophy**

Students admitted to the institute with a special interest in philosophical authors or topics may be admitted to the joint program in medieval philosophy. Administered jointly with the Department of Philosophy, the program modifies the standard doctoral program for medieval studies in the following ways:

1. Four courses are taken in the Department of Philosophy, not counting courses cross-listed in the institute. Typically, the philosophy courses include work in ancient and modern philosophy as well as thematic seminars in the area of a student’s special interest. For students with little prior preparation in recent philosophy, the course “Analytic Philosophy” may be required as a fifth course.
2. A special manuscript studies course in the transmission and redaction of university texts is taken in the institute.
3. At least one section of the comprehensive examinations is taken in an area of philosophy outside the medieval period, with a member of the Department of Philosophy serving as examiner.
4. Where appropriate, a member of the philosophy department serves as one of the readers of the dissertation.

Applications for admission to the program are made by letter to the secretary of the Joint Program Committee.

**Concentration in Medieval Comparative Literature**

Students seeking a degree in medieval studies may also concentrate in the area of comparative literature. M.M.S. students must add to the standard five-course distribution requirement three courses in medieval or Renaissance vernacular literature and two graduate-level seminars in medieval or Renaissance comparative literature. Ph.D. students must complete an additional year of course work, and pass oral and written examinations in five fields.

**Course Descriptions**

Each course listing includes:

- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description

Relevant courses in other departments are cross-listed in the Medieval Institute and vice versa.

**Course Descriptions**

### 501, 502. Introduction to Medieval Studies (1-0-1) (1-0-1) Noble and faculty

A one-credit-hour course designed to introduce students to the basic bibliographies, handbooks, and research tools in medieval studies. Professors from various disciplines will participate.

### 503A. Medieval Spanish Literature: From Reconquest to Renaissance (3-0-3) Seidenspinner-Núñez

The defining feature of medieval Spain is the Reconquest, the fluctuating repossession of lands conquered by Muslim invaders in 711 that continued for more than 700 years. This course will survey the masterworks of the Spanish Middle Ages within the ideological, sociocultural, and political context of reconquest Spain and will include the *kharjas*, *Poema de mio Cid*, *romancero*, *Los milagros de nuestra Senora* by Gonzalo de Berceo, *Conde Lucanor* by Don Juan Manuel, *Libro de buen amor* by Juan Ruiz, *Arcipreste de Talavera* by Alfonso Martínez de Toledo, *Carcel de amor* by Diego de San Pedro, *Celestina* by Fernando de Rojas, and miscellaneous selections. Primary texts will be supplemented with critical, scholarly, cultural, and theoretical readings.

### 511. Proseminar in Medieval History I (3-0-3) Noble

A historiographical introduction to medieval history between the years 500 and 1100. The purpose of the course is to acquaint students with important debates on the whole range of historical topics in this era, major historical monographs, and the approaches of major contemporary historians.

### 512. Proseminar in Medieval History II (3-0-3) Biddick, Constable, Van Engen

An introduction to the main topics, interpretations, and themes of the study of the high and later Middle Ages, 1100 to 1500. We will read primary sources each week, but the emphasis will be on the interpretations made by historians and medievalists over the centuries (but especially during the late 20th century) of the culture, economy, society, religion, and politics of this period. Attention will be paid in each of the seminars to “new approaches” to the study of the culture of the Middle Ages—in other words, the theory and assumptions underlying interpretations, the selection of questions asked and to be asked of the sources, and the choice of sources on which to base those interpretations.

### 514. Diplomacy (3-0-3) D.J. Boulton

Gives students practical experience in locating, reading, and understanding documents from England, France, the Empire, Italy, and Spain. All such material will be placed in its cultural, scholarly, institutional, and human setting.

### 516. Introduction to Medieval Music (3-0-3) Bower

An introduction to the theoretical and practical facets of the discipline of music during the Middle Ages. Readings in Boethius, Musica Enchiriadis, Guido of Arezzo, and Johannes Afflighemensis; an introduction to musical paleography and the study of neumes; an introduction to the grammar of liturgical melodies; readings in early theory of polyphony/organum and examination of some early practical examples. Students are expected to have a working knowledge of Latin.

### 517. Paleography (3-0-3) M. Boulton

An introduction to Latin paleography from the beginnings of Latin writings to about
1500. Seminars will cover the developments of handwriting over the course of this period and practical exercises in reading various hands. Special emphasis will be given to the technique of describing medieval manuscripts, to the nature of paleographical research, and to the implications of paleography for other forms of research. Students are expected to have a working knowledge of Latin.

519A. Medieval Theory of the Will (3-0-3) Staff
The concept of the will as a distinct faculty of rational desire is arguably one of the genuinely original and most influential developments of medieval philosophy. This course will trace the origin and evolution of the will from Anselm of Canterbury to Duns Scotus, focusing in particular on the emergence of voluntarism at the end of the 13th century, according to which the will became a completely self-determining, rational power. The consequences of this for other aspects of medieval ethical theory, such as virtues and natural law, will also be examined.

521. Early Christianity (3-0-3) Daly
This course will consider the origins of Christian non-biblical theological literature, from the time of the New Testament until Origen, in the middle of the third century. By reading a wide selection of complete texts in translation from the period, we will try to develop a sense of how Christian thinkers, in the first two centuries of the Church’s history, expressed their emerging sense of the community’s distinctive faith and form of life, in tension and dialogue with Judaism, Gnostic religion, and Hellenistic culture, and how the outlines of the tradition of orthodox Christian theology first emerged in this process. Readings will include early Christian poetry and Biblical apocrypha, letters of pastoral admonition, martyr-acts, apologetic literature, and selections from the more theologically-ambitious works of Irenaeus, Clement of Alexandria, and Origen.

522. Medieval Theology (3-0-3) Wawrykow
The High Middle Ages witnessed tremendous creativity in theology, and the writings of theologians as diverse as Thomas Aquinas and Mechthild of Magdeburg have proven to be of enduring significance. This course examines the high medieval achievement in theology, both scholastic and spiritual, through close study of selections from the most important theologians of the 13th and early 14th centuries. While considerable attention will be given to doctrinal development and intellectual disagreement, cultural as well as literary questions will also receive their due. To what extent did institutional and educational changes stimulate theological progress? Why did theologians employ such a broad range of genres? And are different genres better suited to certain theological tasks? How do earlier writings, both Christian (scriptural, patristic, and early medieval) and non-Christian (especially, but not exclusively, Aristotelian), figure in the high medieval theological enterprise?

523. Early Medieval Philosophy (3-0-3) Gersh
An introduction to medieval philosophy in the pre-scholastic period based on readings of primary sources. The course will be divided into three roughly equal segments: (1) analysis of fundamental concepts in Platonism and Aristotelianism and of their transformation in late ancient and patristic authors (Calcidius, Macrobius, Martianus Capella, Augustine, Boethius, pseudo-Dionysius); (2) philosophy of Iohannes Scottus Eriugena; (3) evolution of doctrine from Gerbert of Aurillac to the “School of Chartres” via Anselm of Canterbury and Peter Abelard.

524. Later Medieval Mystical Theology (3-0-3) Emery
In the Latin world, the term mystical theology was largely a by-product of the widespread reception of the writings of pseudo-Dionysius the Areopagite in the later Middle Ages. Like other medieval arts and sciences, the subject of mystical theology was defined by a corpus of authoritative texts, topics, questions, etc. Moreover, as Dionysius himself taught, mystical theology was conceived to be reciprocally related to “intelligible” or scholastic theology. In this course, we shall read a series of texts that were included in the historically actual library of mystical theology.

525. Lyric and Narrative in Medieval French Literature (3-0-3) M. Boulton
Examines the ideology of troubadour poetry and its influence on French literature of the 12th, 13th, and 14th centuries. We will trace this influence from the narrative response to lyric poetry in the romances of Lancelot and Guillaume de Dole, through the erotic pseudo-autobiographies (Roman de la Rose, Remede de Fortune), to the tendency of lyric cycles to recount stories (Christine de Pizan’s Cent Ballades). In these works and others, the confrontation of lyric and narrative tendencies, the combinations of song and speech, and the intertextual implications of hybrid works will be of particular interest.

525A. Topics in Early Christianity (3-0-3) Cavadini
526. Editing Scholastic Texts (3-0-3) Emery
Takes students through the steps of editing a medieval scholastic text, from the beginning search for manuscripts through their comparison and construction of apparatus.

528A. Jews and Christians throughout History (3-0-3) Signer
In the closing days of the II Vatican Council Nostra Aetate (Declaration on Non-Christian Religions) reversed a negative attitude of the Catholic Church toward Judaism and the Jewish people. This remarkable change promoted “dialogue” with Jews, and positive changes in the ways in which Judaism was presented in Liturgy and Catechesis. Reactions from the Jewish communities were diverse: from rejection to welcome.

This course will explore a number of issues that emerge from the history of Christian thought and theology: How did a negative image of Judaism develop within Christianit? In what ways did these unfavorable teachings contribute toward violence against the Jews? What is the relationship between Christian anti-Jewish teachings and Antisemitism? Is there any correspondence to Christian hostility within Judaism? In what ways have Jewish authors reacted to Christian tradition?

We shall also want to construct a more positive theology for the future. How can Jews and Christians develop religious responses to modernity? In what senses can a study of Judaism by Christians, or Christianity by Jews, help either community to understand itself better? How can Christians and Jews develop a theology of “the other” that is not triumphalist, but empathic?

530. Introduction to Old English (3-0-3) O’Brien-O Keeffe
This introduction to the study of old English will focus on the elements of the
language preparatory to reading and analyzing a variety of prose and verse texts. Issues for discussion and study will include: current and past constructions of philology, the canon, the politics of editing, issues in translation, interpretative strategies, subject formation, issues in period construction, research tools, and possibilities for future work. No prior experience with old or middle English is necessary.

530F. Old Norse
(3-0-3) Lapidge
The Icelandic sagas of the 13th and 14th centuries represent one of the great corpora of narrative literature in the world; and old Norse literature is also characterized by a highly-individual corpus of poetry. This course will aim to acquire familiarity with some of the surviving Norse and Icelandic literature, both in prose and verse, through the medium of the old Norse language (although there will also be opportunity to read some of the literature in translation). A knowledge of old Norse language opens the gateway to a wonderful and extensive literature; but the course should only be attempted by those who have linguistic skill and are dedicated students of medieval vernacular literature.

531C. Constructing Subjects in Anglo-Saxon England
(3-0-3) O’Brien-O’Keeffe
This course addresses the question of the very existence of the subject in the early Middle Ages. To frame the question, participants in the course will read some contemporary theorists of subjectivity as well as some patristic writers on the self. The rest of the course will investigate constructions of subjectivity in mainly prose texts written in England before approximately 1100.

533B. Middle English Drama
(3-0-3) Nolan
This course will cover the origin, development, and performance of middle English drama in the 14th and 15th centuries. We will begin with the emergence of the drama from the quern quaeritii trope in the Easter liturgy, and examine carefully the claim that the secular dramas of the later Middle Ages moved from the altar to the church steps to the streets. Each of the four major Corpus Christi cycles will be discussed, along with saints’ plays and morality plays. We will also survey the major critical approaches to the drama, from formalist accounts of typology and genre to cultural materialist notions of ritual, allegory, and symbol, to historicist examinations of city and performance.

533C. English Religious Writing
(3-0-3) Nolan
This course will explore the tradition of religious writing in middle English, beginning with Richard Rolle and ending with the religious controversies of the 15th century. We will pose a series of related questions: why do writers begin to produce devotional material in English in the 14th century? What are the implications of writing about sacred matters and sacred texts in the vernacular? What are the major theological questions at issue in these texts? How can heresy be distinguished from orthodoxy? What is the emerging definition of the “orthodox” to be found in the repressive legislation of the early 15th century? We will be particularly concerned to read “religious” and “literary” texts in tandem, placing Chaucer’s saints’ lives next to Julian of Norwich’s “shewings,” for example. The course will also consider the critical tradition, exploring historical, theoretical, materialist, literary, feminist, and other ways of thinking about the sacred, the vernacular, and the heretical.

534B. Love Poetry of the Renaissance
(3-0-3) Della Neva
In fall, 2001, this course will focus on the love poetry of the most prominent poet in 16th-century France, Ronsard. Some attention will also be given to the poetry of the “satellites” surrounding this Pléiade poet, especially Du Bellay and Baif. Special attention will be given to the role of Petrarchism (including selected readings from Petrarch’s Italian poems in translation). Topics for discussion will include the development of the sonnet, the concept of the canzoniere genre, rhetoric, literary commonplace, mythology, imitative techniques, intertextuality, and feminist literary criticism.

538. Chaucer: Canterbury Tales
(3-0-3) Frese
A study of the Canterbury Tales read in the original middle English. Chaucer’s comic genius will shape the approach to the text, which has been carefully constituted by its author as a virtual anthology of medieval fictional forms—everything from bawdy stories to saints’ lives engaged Chaucer’s most mature imaginative energies in this, his last great work. The class will work its way toward an appreciation of the kaleidoscopic subtleties involved in his poetic shaping of this wide, deep, and humanely envisioned text-world.

538C. What Happened Before Chaucer? Literature 1066 to 1350
(3-0-3) Mann
The Norman Conquest radically altered literature in English but also gave it a new lease on life by linking it more closely with French forms. This course will explore the fascinating variety of early middle English literature, taking in The Owl and the Nightingale, medieval religious prose for women, Layamon’s Brut, romances, lyrics, Reynard the Fox, Dame Sirith, and more. Part of the time will be devoted to translation and close study of the texts, but we shall also consider their wider literary context by reading (in translation) some of their close relatives in French and Latin, both insular and continental, and think about their historical functions and influence.

539C. First Aid in Middle English
(1-0-1) Mann
Middle English without pain! This compact seminar will meet twice weekly for three weeks in the spring term. It will provide a grounding in middle English grammar and syntax by working through a specially-prepared booklet, and also practice in translating middle English texts. The course is strongly recommended for any graduate student planning to take a middle English course in the academic year 2002-2003, whether or not middle English is their major field.

539E. Problems in Textual Criticism
(1-0-1) Lapidge
Textual criticism is the art and science of evaluating evidence of manuscript-readings in the process of establishing a text, and involves understanding of the vagaries of medieval manuscript transmission. This compact spring seminar will offer an opportunity to discuss the problems that are posed by the transmissional histories of texts composed (in Latin and old English) during the Anglo-Saxon period, but comparative material from earlier (classical and biblical) and later texts will also be brought into play. In particular, attention will be given to ways of adjudicating the apparatus criticus that accompanies “critical” editions, and to the different sorts of problems that are posed by texts transmitted in single manuscripts, in autograph or idioigraph manuscripts, or in multiple copies, and the ways of determining the genealogical relationship (and representing it in a stemma codicum) between individual manuscripts in cases where a work is preserved in more
than one manuscript.

540. Classics of the Italian Renaissance
(3-0-3) Cachey
Five literary classics and the critical discourse surrounding them, including Poliziano's Stanze per la giostra, Sannazzaro's Arcadia, Machiavelli's Il Principe, Castiglione's Cortegiano, and Ariosto's Orlando furioso.

542. Italian Dialect Literature
(1-0-1) Haller
In this mini-course taught by guest professor Hermann Haller, we will discuss aspects of Italy's literary tradition in dialect across time, space, and genres. Following a brief introduction to Italy's dialect varieties, we will consider some major poets who wrote in Milanese, Roman, and Neapolitan dialect. We will also address the plurilingual theatrical tradition in dialect, centered primarily around Naples and Venice. Against the backdrop of Italy's sociolinguistic panorama in the last two decades we will analyze the nature and function of dialects in the present revival of poetic dialects as well as in Italian narrative prose.

543. Seminar: Medieval Spain
(3-0-3) Constable
This course examines the history and historiography of medieval Spain from the eighth to the 15th century. Readings concentrate on the economic, social, and political development of the peninsula and the cross-cultural exchange between its peoples. Particular emphasis will be placed on the Muslim-Christian encounter and the ways in which this relationship has shaped the field of Spanish medieval history.

545. Virtue and Sin in the Christian Tradition
(3-0-3) Porter
There has been considerable interest recently in recovering traditions of reflection on the virtues as a resource for Christian ethics. In this course, we will explore this tradition through an examination of three of its key figures, namely, Augustine, Aquinas, and Jonathan Edwards. Through a close reading of primary texts (in English) and contemporary writings on these texts, we will reflect on what these authors understood by virtue, how their theories of virtue both interpret a past tradition and influence their successors, and how those theories might be relevant to Christian ethics today. Course requirements will include several short papers and a longer paper on a topic to be determined in consultation with the instructor.

547. Dante I
(3-0-3) Cachey, Moevs
Many have considered Dante's Comedy to be the greatest poetic achievement in Western literature. It is also perhaps the most perfect synthesis of medieval culture and the most powerful expression of what even today remains the foundation of the Catholic understanding of human nature, the world, and God. This course is an in-depth study, over two semesters, of the entire Comedy, in its historical, philosophical, and literary context, with selected readings from the minor works (e.g., Vita Nuova, Convivio, De vulgari eloquentia).

548. Dante II
(3-0-3) Cachey, Moevs
Many have considered Dante's Comedy to be the greatest poetic achievement in Western literature. It is also perhaps the most perfect synthesis of medieval culture and the most powerful expression of what even today remains the foundation of the Catholic understanding of human nature, the world, and God. Dante I and Dante II are a close study, over two semesters, of the entire Comedy, in its cultural (historical, literary, artistic, and philosophical) context. Dante II focuses on the Purgatorio and the Paradiso, with some discussion also of the Monarchia.

557. Early Renaissance Italy
(3-0-3) Rosenberg
The development of Italian painting, sculpture, and architecture from 1280 to 1480. Works by such artists as Giotto, Masaccio, Brunelleschi, Donatello, Alberti, and Botticelli will be considered in the context of the period that gave birth to the modern language of art and witnessed the revival of the centrality of man as the greatest of God's creatures.

558. Northern Renaissance Painting
(3-0-3) Rosenberg
The development of painting in northern Europe (France, Germany, Flanders, and Holland) from approximately 1300 to 1500. Special attention will be given to the art of Jan van Eyck, Hieronymus Bosch, Albrecht Dürer, and Pieter Brueghel. In tracing the evolution of manuscript and oil painting and the graphic media, the student will become conscious of the special wedding of nature, art, and spirit that defines the achievement of the Northern Renaissance.

559. Early Medieval Art: The Illuminated Book
(3-0-3) Barber
This course will investigate the art produced in Western Europe between the seventh and 11th centuries. Often characterized as a Dark Age, this period in fact demonstrates a fertile, fluid, and inventive response to the legacy of Late Antique Christianity. The course will focus on the production and reception of illuminated manuscripts, using facsimiles of these works as a basis for teaching. Students will become familiar with art-historical methods for the examination of such works and will be invited to contemplate the interplay of word and image that these books propose. Categories of material discussed include: Insular art, the Carolingian scriptoria, Ottonian imperial image making, Anglo-Saxon art, Spanish Apocalypse, and Italian Exultets.

566. Trecento: Giotto to the Duomo
(3-0-3) Gill
Beginning with Giotto's Scrovegni Chapel in Padua, we will examine the arts in Italy in the 1300s, concluding with Brunelleschi's revolutionary design for the dome of the Florence Cathedral of 1436. We will consider the regional traditions of the city-states, including Siena, Venice, Florence and Pisa, as well as Rome, and as expressed in narrative fresco programs, altarpieces, sculpture, and architecture. Among our subjects are the royal tombs in Naples and Milan, the evolution of the equestrian monument, St. Mark's in Venice, the character of Gothic expression in Italy, and impact of the Black Death.
essential texts and topics surrounding the Italian “questione della lingua” with a focus on the Medieval and Renaissance periods, from the origins and Dante’s De vulgari eloquentia (c. 1305) to Pietro Bembo’s Prose della volgar lingua (1525) and the linguistic debates of the High Renaissance. A post-Renaissance perspective on the language question will be integrated through participation in Prof. Hermann Haller’s compact seminar on dialect literature of Italy during the course of the semester. Besides regular seminar presentations addressing course readings, students will be required to develop research projects examining the impact of the language question on the development of Italian literary history utilizing primary source materials from Renaissance holdings in the Department of Special Collections, Hesburgh Library.

571. The Vulgate and Related Texts
(3-0-3) Bower
Readings and critical discussion of the various layers of texts in the Vulgate Bible: 1) the old, essentially unreviewed layer (Acts, Epistles, Apocalypse); 2) Jerome’s revised Psalter (Gallican); 3) Jerome’s revised Gospels; 4) Jerome’s translations from the Hebrew (Canonical Books of the Old Testament, included the Psalter iuxta Hebraicum). Some of Jerome’s introductory material will also be read, along with several passages from Augustine’s de doctrina christiana. An elementary knowledge of Latin is prerequisite; students will be expected to translate in class.

572. Bede’s Latin Poetry
(3-0-3) Lapidge
The Latin poetry of Bede (d. 735) was widely studied in the early and central Middle Ages, both for its technical excellence and for its poetic style (Bede knew as much about verse composition as any early medieval author, and his treatise on metrics, De arte metrica, served as the standard introduction to the subject up until the 16th century). Oddly, however, his Latin verse has been neglected: it has never been collected together, and has never been translated. This course will attempt to study the entire corpus of Bede’s Latin poetry: to assemble his scattered Epigrammata, to study his hymns in the light of the Ambrosian tradition of hymn composition; and to read carefully through his Vita metrica S. Cuthbert, one of the most difficult but elegant poems of the Latin Middle Ages. The course will serve as an introduction to the technique of quantita-

573. Latin for Medieval Philosophy
(3-0-3) Gersh
The aims of the course will be both linguistic and philosophical. Via the reading of 25-30 short extracts, we shall on the one hand study the evolution of Latin style and technical vocabulary through patristic, Carolingian, 12th-century scholastic and humanistic writings, and on the other consider the manner and extent to which philosophical thought itself has been influenced by the language in which it is presented and articulated. The course is aimed at philosophers wishing to prepare themselves for the study of primary sources in Latin and philologists wishing to acquire some understanding of this specialized and important type of literature. Although grammar and syntax will be explained by the instructor whenever necessary, a knowledge of basic Latin will be assumed.

574. Introduction to Plotinus
(3-0-3) Gersh
The course will be divided into two parts: (1) A general survey of Plotinus’ philosophy based on writings of his early and middle periods; (2) A close study of Plotinus’ longest treatise (divided into four parts by Porphyry): Enneads III.8, V.8, V.5, II.9. In both parts of the course, our aim will be not only to understand Plotinian thought as a system of emanative monism but also to evaluate the expository and argumentative techniques by which this thought is organized into verbal discourse.

575A. 576. Medieval Latin
(3-0-3) Sheerin
This will be a survey of the varieties of medieval Latin literary texts. Keith Sidwell’s Reading Medieval Latin will serve as the base text, with occasional supplements especially for the period after the 12th century. Goals for the course are enhancement of reading skills and experience of an overview of medieval Latin literature, with acquisition of bibliographical knowledge that will allow the student to continue working in her/his own in this area.

579. Latin Wit and Wisdom: The collection and use of the sententiae
(3-0-3) Bloomer
This seminar will examine the long tradition of collection of sententiae, the Latin aphorisms that were an integral part of ancient and medieval schooling, moral formation, and learning. We shall begin with a brief overview of the gnomes and proverb as species of sapiential literature, but as a working practice we shall focus in the main on the history of some of the great collections (Publius Syrus, aka Seneca Philoponus; the Distichs of Cato). Reading a text for its sententiae is both a scribal act and a hermeneutic process—in brief, a good way to examine a very different sort of reading and writing from the modern. Far from being museum items, collections of verbal lore are meant to be used, embellished, and imitated. Another major focus thus will be on new collections (Alcuin, Otho, Egberts, perhaps a final week on the apex of the tradition, Erasmus’ Adagia).

580. Seminar in Medieval Art: Art and Worship in Byzantium
(3-0-3) Barber
An exploration of the many ways in which art and worship interacted in Byzantium. The core of the seminar will be on the 11th and 12th centuries. This period has been defined as the moment during which iconographies deployed in liturgical contexts began to respond to these liturgical texts, producing innovative formulae that firmly embedded the visual in this functional and performative setting. The task of this seminar will be to examine the grounds for this correlation. Building upon the work of Demus, Mathews, and Walter, we will consider the interplay of visual and verbal forms, investigate the question of influence, test a variety of methods for using function as a category for visual analysis, and set these changes within the wider context of Byzantine worship and culture. The material introduced for discussion will include homilies, liturgies, hymns, and commentaries, monumental art, manuscripts, and icons.

581. Medieval German Literature
(3-0-3) Wimmer
A survey of German literature from its beginnings during Germanic times until the 17th century. Ideas, issues, and topics are discussed in such a way that their continuity can be seen throughout the centuries.
Readings include modern German selections from major medieval authors and works such as Hildebrandlied, Rolandlied, Nibelungenlied, Iwein, Parzival, Tristan, courtly lyric poetry, the German mystics, secular and religious medieval drama, Der Ackermann aus Böhmen, and the beast epic Reineke Fuchs.

582. The Medieval Book
(3-0-3) Bower
A historical survey of the medieval book as a cultural, archeological, artistic, and commercial object from about A.D. 300 to 1500. General outline: (1) the early Middle Ages: from scroll to codex, the Bible in the early Middle Ages, insular gospel books, continental book production; (2) the Carolingian Renaissance and its heritage: spiritual and pedagogical foundations of book culture, deluxe products, critical texts, authors and their manuscripts, the glossed book, and the monastic scriptoria of the 10th to the 12th centuries; (3) the later Middle Ages: the university book trade, popular spirituality and the book trade (i.e., Book of Hours).

590. Byzantine Art
(3-0-3) Barber
Byzantine art has often been opposed to the traditions of Western naturalism, and as such has been an undervalued or little known adjunct to the story of medieval art. In order to develop a more sophisticated understanding of this material we will examine the art produced in Byzantium in the period from the ninth to the 12th century, a period that marks the high point of Byzantine artistic production and influence. Stress will be placed upon the function of this art within the broader setting of this society. Art theory, the notions of empire and holiness, the burdens of the past and the realities of contemporary praxis will be brought to bear upon our various analyses of material from all media. How we, as art historians can write the history of this rich culture will be a central issue of this course.

598. Special Studies
(V-V-V) Staff

602. Canon Law in the High Middle Ages
(3-0-3) Van Engen
This course will introduce students to the study of canon law in the high Middle Ages. It will teach them the structure and usage of Gratian’s Decretum, the university textbook, and of the papal Decretales (1234), the only truly authorized lawbook of the medieval church. In addition, students will learn to use and to read the extensive glossating and commentary literature that grew up around these authoritative texts. To focus the students’ historical approach, the Fall 2001 semester will focus on teachings about custom, arguably the most omnipresent and socially significant form of law in the Middle Ages: its status in law, its authority over against positive legislation or court decisions, and quite particularly the venues and practices in the church where custom was presumed to prevail.

603. Seminar: Story and History in 13th-century Europe
(3-0-3) Van Engen
This course explores the place of “stories” in the making of medieval culture, and the degree to which we can draw “history” from them. It will touch upon some of the same conceptual problems raised recently in discussions of the distinction between fiction and history. The course will focus on examples from three key areas of storytelling: the exempla, which became so crucial to sermons and moral instruction; chronicles (such as Salimbene’s), which became ever more story-like in their construction; and hagiography.

605. Colloquium: Commercial Revolution in the Middle Ages
(3-0-3) Constable
The theory of a commercial revolution in Europe and the rise of so-called “European hegemony” provides a focus for looking at a broad spectrum of issues and documents relevant to the rise of agrarian, commercial and urban institutions in medieval Europe. This course will concentrate on the problems of the shifting balance of power in the Mediterranean world in the Middle Ages. Although it is easy to see a shift from Muslim to Christian hegemony in this period, it is much harder to find an explanation for this change. Theories range from crude cultural superiority to subtler explanations involving differential technology, mercantile, and agrarian development; political and military structure; monetarization and metallic balance; or demographic shifts in reaction to the Black Death. This colloquium will consider these changes, and their possible explanations, in light of both primary texts and secondary interpretations.

606. Colloquium: Medieval Cities
(3-0-3) Constable
This colloquium examines the development and structure of urban centers in Europe and the Mediterranean world from late antiquity to the later Middle Ages through a discussion of primary texts, secondary historical studies, and works on modern urban theory.

609. Merovingian Franks, 450 to 750
(3-0-3) Noble
This course will survey and analyze key literature and sources on the establishment, development, and eventual collapse of the Merovingian Frankish kingdom. Central issues will include: the nature, origins, and audiences of the major sources; Frankish ethnicity; Frankish kingship; central and local institutions in the Frankish kingdoms; the economy of Merovingian Francia; the Merovingian church; academic and intellectual institutions; problems of language and communications; and Merovingian relations with their neighbors. Student responsibilities will include: substantial weekly reading assignments (most but not all sources will be read in translation; scholarly works in French and German will be assigned); periodic oral and written reports; and two or three synthetic essays.

621. Early Christianity Seminar: Augustine
(3-0-3) Cavadini
Many disciplines lay claim to the study of Augustine, for he is a figure whose influence upon Western culture is difficult to overestimate. This course seeks to accommodate the needs of students who come to the study of Augustine with a variety of interests. There will be a continuing emphasis on access to materials, both primary and secondary, so that students will be able to develop their own research interests with facility. Special attention will be given to the development of Augustine’s thought. We will rely in part on the Letters to provide a continuous historical backdrop for the reading and interpretation of the other texts. Thus the class will have a strongly textual, rather than thematic, principle of organization, emphasizing the reading in their entirety of works from the different periods of Augustine’s life.

622. Early Christianity Seminar
(3-0-3) Leyerle

633. Medieval Exegesis Seminar
(3-0-3) Signer
Our focus during the semester will be on the relationship between biblical interpretation and the polemical literature written by Jewish and Christian authors from 1050 to 1200. Students will read the recent accounts
of this literature by Gavin Langmuir, Anna Sapir Abulafia, Gilbert Dahan, and Jeremy Cohen. Excerpts from medieval Christian authors such as Abelard, Gilbert Crispin, Guibert of Nogent, Bernard of Clairvaux, Peter the Venerable, Petrus Alfonsi, and Alan of Lille. Passages from Jewish authors such as Rashi, Rabbi Joseph Kara, Rabbi Samuel ben Meier, and Rabbi Joseph of Orleans will also be studied. Students will be expected to make an oral presentation and write a paper that provides an explication of the arguments in a polemical work.

634. Medieval Theology Seminar: Christology of Aquinas
(3-0-3) Wawrykow
Thomas Aquinas offered sustained reflections on Jesus Christ in a wide variety of his works and, throughout his career, Thomas's Christology played a central role in his entire theology, providing a distinctive cast to his understanding of God and the human person. This course examines the Thomistic accomplishment in Christology, paying particularly close attention to the different ways in which Thomas organized his various discussions of Christ and to the principal developments in his depiction of Christ.

647. Cultures in Contact
(3-0-3) Constable
This colloquium will consider the cross-cultural history of the western Mediterranean, including North Africa, southern Italy, and France, Sicily, and the Iberian Peninsula from the eighth to the 15th century. Special attention will be devoted to political, social, economic, and cultural contacts between Jews, Christians, and Muslims in this region. The course will focus primarily, but not exclusively, on secondary monographs and articles. Students may write either a research paper or a historiographical essay.

652. Moral Theology: Thomas Aquinas and his Interlocutors
(3-0-3) Porter
In recent years there has been a resurgence of interest in Aquinas' ethical thought, but without attention to the context from which it emerged. Yet Aquinas' moral thought cannot be fully understood or appreciated unless it is placed in relationship to his interlocutors. Furthermore, the study of his moral thought in this way enables us to see how moral concepts develop over time and how they are shaped by social and cultural, as well as intellectual factors. In this course we will examine Aquinas' writings on the natural law in the context of relevant texts from selected 12th- and 13th-century authors, including Abelard, Gratian, William of Auxerre, Bonaventure, and Albert the Great. All texts will be made available in translation, although students who wish to read them in Latin will be given the opportunity to do so. Course requirements will include several short papers and a longer paper on a topic to be determined in consultation with the instructor.

673. Medieval Liturgy
(3-0-3) Driscoll
The purpose of this seminar is to examine the various sacramental rites in the Middle Ages, especially the Eucharistic liturgy, and to attempt to reconstruct them within the context of liturgical enactment, architectural space, artistic and musical decoration, etc. The seminar must necessarily deal with liturgical texts, but this is only a first step for understanding the broader dimensions of the liturgy. Architectural, artistic, and musical components will be taken into consideration. Numerous commentaries on the liturgy are also an important source for garnering the medieval understanding of the liturgy, especially in its allegorical interpretation. A tangential but key element for the understanding is the devotional and spiritual practices that grew up alongside the official liturgy. Therefore, some attention will be given to these dimensions, including liturgical drama.

688. Medieval Legal History
(3-0-3) Rodes
Studies the formative period of the Anglo-American legal system using 14th-century Year Books and other materials from the same period. Students are graded on individual presentations and papers. Topics are flexible, as long as they involve the use of primary source material involving England from about 1250 to 1350.

696. Field Examination Preparation
(3-0-3) Director
Offers students a possibility, normally in their second or third year, to work closely with a professor in preparing for one of their field examinations.

696A. Dissertation Proposal Preparation
(V-V-V) Director
Offers students the opportunity to work with their adviser in preparing their dissertation proposal.

697. Directed Readings
(V-V-V) Director
Offers students a possibility, normally in their second or third year, to work closely with a professor in preparing a topic mutually agreed upon. Student and professor must sign a form that records the readings.

699. Research and Dissertation
(V-V-V) Staff
Independent research and writing on an approved subject under the direction of a faculty member.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

Faculty
ABBOT ASTRIK L. GABRIEL, Director of the Frank M. Folsom Ambrosiana Microfilm and Photographic Collection and Professor Emeritus. Ph.D., Univ. of Budapest, 1936; Privatdozent, ibid., 1941; Ecole des Chartes; Hautes Etudes, Paris, 1932–36; Corresponding Fellow, Institut de France, 1962; Corresponding Fellow, Bavarian Academy of Sciences, 1971; Honorary Member, Hungarian Academy of Sciences, 1983. (1948)


RALPH M. MCNERNEY, Michael P. Grace Professor of Medieval Studies. B.A., St. Paul Seminary, 1951; M.A., Univ. of Minnesota, 1952; Ph.L., Univ. Laval, 1953; Ph.D., ibid., 1954. (1955)


Associated Faculty

JOSEPH P. AMAR, Associate Professor of Classics. B.A., Catholic Univ. of America,


W. MARTIN BLOOMER, Chair and Associate Professor of Classics. B.A. Yale Univ., 1982; M.A. ibid., 1983; M.Phil., ibid., 1984; Ph.D., ibid., 1987 (1998)


THEODORE J. CACHEY JR., Professor of Italian Language and Literature. B.A., Northwestern Univ., 1974; M.A., Univ. of California, Los Angeles, 1982; Ph.D., ibid., 1986. (1990)


PAUL M. COBB, Assistant Professor of History, B.A., Univ. of Massachusetts, 1989; M.A., Univ. of Chicago, 1991; Ph.D., ibid., 1997. (1999)


KENT EMERY JR., Professor in the Program of Liberal Studies. B.A., Univ. of Virginia, 1966; M.A., Univ. of Toronto, 1968; Ph.D., ibid., 1976. (1985)


DOLORES WARWICK FRESE, Professor of English. B.A., College of Notre Dame of Maryland, 1958; M.A., Univ. of Iowa, 1961; Ph.D., ibid., 1972. (1973)


MICHAEL LAPIDGE, Notre Dame Professor of English. B.A., Univ. of Calgary, 1964; M.A., Univ. of Alberta, 1965; Ph.D., Univ. or Toronto, 1971. (1999)


GRETCHEN J. REYDAMS-SCHILS, Associate Professor in the Program of Liberal Studies. B.A., Catholic Univ. of Leuven, 1987; M.A., Univ. of Cincinnati, 1989; Ph.D., Univ. of California, Berkeley, 1994. (1994)
Robert E. Rodes, Paul J. Schlier/Fort Howard Corporation Professor of Legal Ethics and Professor of Law, A.B., Brown Univ. 1947; LL.B., Harvard Univ., 1952 (1956)


Constantina Scourtis, Assistant Professor of Theology, B.A., Univ. of California, Los Angeles, 1990; M.A., ibid., 1995; C. Phil., ibid., 1997. (2001)

Dayle Seidenspinner-Nuñez, Chair of Romance Languages and Literatures and Professor of Spanish Language and Literature, B.A., Univ. of California, Berkeley, 1968; M.A., ibid., 1971; Ph.D., Stanford Univ., 1977. (1977)

Daniel J. Sheerin, Professor of Classics, B.A., St. Louis Univ., 1965; Ph.D., Univ. of North Carolina at Chapel Hill, 1969. (1985)

Susan Guise Sheridan, Associate Professor of Anthropology, B.A., Univ. of Maryland, 1984; M.A., ibid., 1986; Ph.D., Univ. of Colorado, 1992. (1992)

Rabbi Michael A. Signer, Abrams Professor of Jewish Studies (Theology), B.A., Univ. of California, Los Angeles, 1966; M.A., Hebrew Union College-JIR, 1970; Ph.D., Univ. of Toronto, 1978. (1992)

John Van Engen, Andrew V. Tack Professor of History, A.B., Calvin College, 1969; Ph.D., Univ. of California, Los Angeles, 1976. (1977)


Albert K. Wimmer, Director of Graduate Studies and Associate Professor of German Language and Literature, M.A., Univ. of Notre Dame, 1964; M.A., ibid., 1967; Ph.D., Indiana Univ., 1975. (1964)

Music

Acting Chair: Alexander Blachly
Director of Graduate Studies: Karen Buranskas
Telephone: (219) 631-6211
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The Program of Studies
The Department of Music offers programs leading to two degrees: master of music (in performance and literature or performance) and master of arts (in musicology or theory).

All applicants must fulfill the general requirements for admission into the Graduate School. Applicants for the performance degree programs should come to campus for an audition if possible. If a personal audition is not possible, applicants may submit a video or cassette tape recording with their application. Applicants for the M.A. programs must submit an undergraduate paper or other example of their writing.

The master’s programs normally require two years for completion. All master’s degree programs require 36 credit hours. Specific details of each degree program vary substantially, depending on the student’s specialty or instrument. Therefore, students should obtain a copy of the department’s official Bulletin of Information, which contains detailed information on each of the department’s programs and its requirements. A sketch of each program follows:

The master of music degree in performance and literature provides an intensive program of graduate studies for the student with a proven ability in performance and an interest in the literature of his or her instrument. All students in this degree program must present two full recitals: a qualifying recital during the first year of study and a degree recital in the second year. (Students in the piano-accompanying concentration perform in two chamber music recitals and serve as accompanists for six recitals.)

The courses of study vary from instrument to instrument, given their different needs and possibilities. In general, all students in the M.M. in performance and literature take 12 credit hours in their principal instrument and an additional 12 credit hours in a core of courses in music history and theory (six credit hours in each). The remaining 12 credit hours are taken in courses in literature, chamber music, opera workshop, orchestral excerpts, and so forth, as appropriate. All students in this degree program must pass a competency examination in basic music theory and history before they graduate. This examination covers the standard theoretical and historical issues included in a typical undergraduate music program.

The master of music in performance is a degree designed to give intensive training to a student who has finished a master’s degree elsewhere and who wants further training in his or her instrument (but does not wish to pursue a doctorate). This program is designed for highly advanced students who are preparing to enter the professional ranks of performing musicians. The program is designed to place maximum emphasis on the study of the student’s principal instrument. Two full-length recitals are required (eight recitals as accompanists for pianists wishing to specialize in accompanying). Extensive repertoire will be covered during this two-year program, giving the students direct practical experience with a wide range of the most challenging works written for the instrument: solo, orchestral, and chamber.

The master of arts degrees in musicology and theory provide the student with intensive professional training in the scholarship of music, concentrating either in theory or musicology. These programs are designed to enable the students, upon graduation, to enter a top-level doctoral program at another university. Students in the M.A. programs must pass a reading examination in French, Latin, or German, must submit a master’s thesis to the graduate committee, and must pass a final written comprehensive examination. Students whose interests are in medieval music will benefit from the exceptional resources of the Medieval Institute.

Course Descriptions
Each course listing includes:
– Course Number
– Title
– (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
– Instructor
– Course Description
– (Semester normally offered)
Course numbering does not indicate level of student achievement. Repetition of the course numbering on a transcript indicates further studies.

Applied Music
All are normally offered each semester.

501. String Performance Techniques
(1-0-1) Buranskas, Plummer
Performance class/master class format designed to give string students opportunities in which to perform.

501A. Orchestra
106 The Division of Humanities

(V-0-1) Stowe
An ensemble devoted to preparation and performance of orchestral music of the 18th to 20th centuries.

502. Vocal Performance Techniques
(1-0-1) Resick
Development of interpretation skills pertaining to songs and operatic literature.

503. Diction I—German
(1-0-1) Resick
Elements and expressive techniques of German diction, utilizing the International Phonetic Alphabet.

504. Diction II—English, Italian
(1-0-1) Resick
Elements and expressive techniques of English and Italian diction, utilizing the International Phonetic Alphabet.

505. Diction III—French
(1-0-1) Resick
Elements and expressive techniques of French diction, utilizing the International Phonetic Alphabet.

506. Piano Performance Class
(1-0-1) Stäblein
Master class format designed to give piano students opportunities in which to perform.

508. Orchestral Excerpts
(1-0-1) Buranskas, Plummer
Excerpts from the standard orchestral literature encompassing styles from the 18th century through the 20th century. Instructed by individual members of the faculty.

509. Chamber Music
(V-0-V) Buranskas, Plummer, Resick, Stäblein
Intensive study and performance of chamber music for advanced performers.

510. Piano
(V-0-V) Stäblein
Individual instruction.

511. Organ
(V-0-V) Cramer
Individual instruction.

512. Harpsichord
(V-0-V) Catello
Individual instruction.

514. Voice
(V-0-V) Ginter, Resick
Individual instruction.

515A. Violin
(V-0-V) Plummer
Individual instruction.

515B. Viola
(V-0-V) Staff
Individual instruction.

516. Cello
(V-0-V) Buranskas
Individual instruction.

517. Brass
(V-0-V) Wiskirchen
Individual instruction. Arrangements possible with members of Chicago Symphony with chair’s permission.

518. Woodwinds
(V-0-V) Dye
Individual instruction. Arrangements possible with members of Chicago Symphony with chair’s permission.

519. Percussion
(V-0-V) Staff
Individual instruction.

525, 526. Advanced Conducting I and II
(2-0-2) Blachly, Dye
Study and practice of advanced skills in conducting. Score analysis for conductors; rehearsal techniques; principles of stylistic integrity in performance.

528. Opera Workshop
(V-0-V) Resick
Prerequisite: vocal training. Musical and stage preparation of an opera production culminating in public performance. Admission by audition only.

529. Vocal Coaching
(1-0-1) Resick
Development of interpretation skills pertaining to songs and operatic literature.

Core of Courses in Music History and Theory
This core of courses provides a basic curriculum required of all students in the performance and literature and musicology/theory programs. Each student must take 12 credit hours from the core, six in theory and six in history.

531. Analytic Topics
(3-0-3) Johnson, Smith
Detailed analysis of selected works.

532. 20th-Century Analysis
(3-0-3) Haimo, Johnson
Techniques of composition employed by composers of the 20th century.

533. Schenkerian Analysis
(3-0-3) Smith
Intensive analysis of musical composition utilizing the Schenkerian method.

534. Tonal Forms
(3-0-3) Haimo
Topics relating to the problems of form in tonal music.

535. Opera
(3-0-3) Youens
Topics relating to the history of opera.

536. Chamber Music Genre
(3-0-3) Youens
Topics relating to the history of chamber music.

537. Church Music
(3-0-3) Bower, Frandsen, Higgins
Topics relating to the history of church music.

538. Symphonic Music
(3-0-3) Bower
Topics relating to the history of symphonic music.

The Studies Series
The following series of courses treats problems in historical periods and general areas of musical research. They will be listed in schedules for each semester with further descriptions indicating the focus for that semester. The range of approach to these courses is broad; they may be general surveys of a period or an area or they may center around a specific topic within a period or area or even a specific composer. Recent offerings have included courses on Handel and the German Lied. Also satisfies Core History requirements.

542, 543. Studies in Medieval Music
(3-0-3) (3-0-3) Bower, Higgins
An examination of the music from the fifth through 15th centuries.

544, 545. Studies in Renaissance Music
(3-0-3) (3-0-3) Blachly, Higgins
An examination of the music from 1430 to 1600.

546. Handel’s Operas and Oratorios
(3-0-3) Frandsen
An examination of Handel’s operas (including Rinaldo, Julius Caesar, and Xerxes) and oratorios (including Esther, Israel in Egypt, and Jephtha), with a particular focus on Handel’s approach to drama and musical characterization in each genre, and his appropriation and redefinition of operatic conventions in the context of the English theatrical oratorio.

548, 549. Studies in Classical Music
(3-0-3) (3-0-3) Higgins, Youens
An examination of the music from 1700 to 1820.

550. Studies in Lied
(3-0-3) Youens
The study of selected German art-sons for solo voice and piano by the masters of the genre.

Other Courses in Music
540. Bibliography of Music
This course has five main objectives:
1. To learn about music in libraries, its control and organization, and to develop a sense of comfort with library collections of music.
2. To study standard reference works in music—both print and electronic sources—and understand their value, deficiencies, and potential uses.
3. To develop an ability to evaluate new reference sources and to choose works that will be of the greatest value to any particular project.
4. To develop a sense of the state of musical documentation in general.
5. To demonstrate this knowledge and these abilities by performing the preliminary work for a major research project.

563, 564. Composition
(V-0-V) (V-0-V) Haimo, Johnson
Private instruction in composition.

565. Band Arranging
(3-0-3) Dye

575. String Literature
(3-0-3) Buranskas, Plummer
Concentrated study of the principal literature written for the string instruments.

579. Wind Literature
(3-0-3) Staff
An exploration of the history of the literature for winds from the works of Giovanni and Andrea Gabrieli to the present century.

581, 582. Piano Literature
(2-0-2) (2-0-2) Stabile
Concentrated study of the principal literature written for the keyboard.

583, 584. Organ Literature
(3-0-3) (3-0-3) Cramer
Concentrated study of the principal literature written for the organ.

587. Advanced Violin Literature
(3-0-3) Plummer
Extensive study of violin repertoire with an emphasis on sonatas, concertos, and solo works from the Baroque period to the 20th century.

588. Advanced Cello Literature
(3-0-3) Buranskas
Extensive study of cello repertoire with an emphasis on sonatas, concertos, and solo works from the Baroque period to the 20th century.

590. Qualifying Recital
(0-0-0) Johnson
For first-year students.

591. Graduate Recital
(0-0-0) Staff
Formal registration for final project in performance.

598. Special Studies
(V-V-V) Staff
Individual study under personal direction of a faculty member.

599. Thesis Direction
(V-V-V) Staff
Planning and developing the master’s thesis for M.A. students.

600. Nonresident Thesis Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

Faculty
ALEXANDER BLACHLY, Chair, Professor.

CALVIN M. BOWER, Professor.

KAREN L. BURANSKAS, Director of Graduate Studies and Associate Professor.

DARLENE CATELLO, Adjunct Instructor.

WILLIAM CERNY, Professor Emeritus.
B.A., Yale Univ., 1951; B.Mus., ibid., 1952; M.Mus., ibid., 1954. (1972)

CRAIG J. CRAMER, Professor.

KEN DYE, Director of Bands and Professor.

MARY E. FRANDSEN, Assistant Professor.

WALTER R. GINTER, Adjunct Associate Professor.
B.Mus., Westminster Choir College, 1956; M.Mus., ibid., 1957. (1975)

ETHAN T. HAIMO, Professor.

PAULA M. HIGGINS, Professor.

PAUL G. JOHNSON, Associate Professor.

EUGENE J. LEAHY, Professor Emeritus.

REV. PATRICK H. MALONEY, C.S.C., Associate Professor Emeritus.
B.A., Univ. of Notre Dame, 1950; M.Mus., Catholic Univ. of America, 1956. (1956)

JAMES S. PHILLIPS, Assistant Professor
Ph.D. Program in Literature

Program Director and Director of Graduate Studies: Margaret Anne Moody
Associate Director: Collin Meissner
Telephone: (219) 631–9723
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(www.nd.edu/~litprog)

The Program of Studies

The Ph.D. in Literature at Notre Dame is an interdisciplinary program, which focuses on the study of literature from a transnational and intercultural perspective. The program combines the outstanding faculty and resources of a number of departments and programs, such as Classics, East Asian Studies, German, Irish Studies, Romance Languages, enabling doctoral students to study literature both within traditional disciplines and from across disciplinary and global perspectives.

Intellectual opportunity. Designed for the intellectually ambitious and creative student, the Ph.D. Program in Literature requires both depth and breadth of language and literature coverage while offering the individual student ground-breaking curricular freedom in the design of his or her degree.

Intellectual strength and support. Notre Dame is well known as an intellectual center for the study of the ancient world, religion and literature, medieval life and culture, Irish literature and culture, the Renaissance, and modernism. The admitted student will enjoy the company of his or her peers and a close association with a diverse and lively group of faculty from the departments listed above and other departments and institutes at Notre Dame, such as the departments of English, philosophy, theology, and the Medieval Institute, to name a few. Each student will be welcomed and expected to be a valued and contributing member of this community of scholars.

Institutional support. The student in the Ph.D. Program in Literature will enjoy the on-campus presence of the Erasmus Institute, the Kellogg Institute for International Studies, the Keough Institute for Irish Studies, and the Medieval Institute, among others. These institutes, like the University departments, bring distinguished scholars as visiting speakers to campus and hold conferences of international repute.

Notre Dame’s Theodore M. Hesburgh Library houses some three million volumes and subscribes to over 23,000 serial publications. In addition to the library’s general holdings, it also has world-renowned special collections in Dante, the Byzantine world, the Spanish Inquisition, and Irish literature. The University also enjoys the presence of the Snite Museum of Art, recognized as one of the top university art museums in the country.

Financial support. Each admitted doctoral student will be completely funded through full tuition waivers and one or a combination of teaching, research, and graduate fellowships. The most promising students will be offered two-year duty-free fellowships of $18,000 per year with an accompanying one-time $2,000 travel account.

General Requirements

The student in the program is required to complete a minimum of 54 credit hours of study (18 courses) during three years of course work, including a minimum of six courses in his or her primary field of study, five in the primary field and/or related fields, and five specially designed seminars in literature. During the first two years of study, the student must complete the program’s specially designed course in literary theory, as well as a team-taught course in world literature that focuses attention on multiple regions, periods, and languages within and beyond the borders of Europe and the Americas. Before the end of the second year of course work, the student must complete at least one course each in philosophy and in theology so as to better understand the historical disciplines that have shaped the ways we talk and think about literature.

Courses

primary field* 6 courses 18 credit hours
primary and/or related fields 5 courses 15 credit hours
literature seminars 5 courses 15 credit hours
philosophy 1 course 3 credit hours
theology 1 course 3 credit hours

* Primary field and related fields may be organized around periods (e.g., late antiquity, medieval, Renaissance, enlightenment, fin de siècle, etc.); around genres (e.g., epic, tragedy, comedy, the ancient and/or modern novel, etc.); around literary movements (e.g., modernism, symbolism, the avant-garde, etc.); or around languages (e.g., ancient Greek, Latin, French, Spanish, German, Italian, etc.).

Languages. Each doctoral candidate in the program must obtain facility with three languages, one of which may be his or her native tongue. The student will be required to demonstrate native or near-native proficiency in his or her primary field language and scholarly reading knowledge of one additional relevant language. The program is designed to ensure that the student’s language proficiency will qualify him or her as a competitive candidate in traditional language departments. Language competency must be certified by the program’s administrative board and must be demonstrated by successful completion of advanced course work, research in the language, or certified by examination. Language and basic skills requirements must be completed by the end of the third semester of residence. The advanced students will also be expected to pursue a year of study abroad through programs such as the Fulbright Foundation and other fellowship opportunities (e.g., Chateaubriand...
Fellowships, residential fellowships at the Goethe Institute, the Ecole de Chartes, etc.).

Examinations. Successful completion of the master’s examination permits the student to proceed with his or her scholarship in the program. The exam is administered in January of the second year in residence. The oral examination must be no less than 90 minutes and no more than two hours in length. The examination for the student in Classics fields typically includes an exercise in translation; this portion of the written examination may be administered at the end of the second year.

The Ph.D. candidacy examination, consisting of a written and an oral component, normally takes place at the end of August in the student’s third year of residence. The written portion of the exam is comprised of four or five two-hour essays on topics (derived from course work and relevant reading lists) selected by the examination board in areas pre-selected by the student and in consultation with the faculty. One take-home exam, focused on a special reading list created by the student and his or her advisors, functions as a bridge to the dissertation proposal. The oral examination involves questioning by the board for no less than ninety minutes and no more than three hours. Successful completion of both examination components is required for advancement to the dissertation-writing stage of the Ph.D. Students who fail the examination may appeal one time to the director to retake the failed portion.

Admissions. To qualify for the program, an applicant must have completed an undergraduate degree, ordinarily in a relevant literary field. While some departments and programs at Notre Dame grant the M.A., the Program in Literature admits only students intending to pursue the doctorate. Students who have already completed the master’s degree in a relevant literary field or in a related non-literary field (such as anthropology, history, theology, philosophy, etc.) are encouraged to apply. Work completed at another institution may, upon determination by the program’s administrative board, be credited toward the Ph.D. An advanced level of preparation in the languages relevant to a student’s proposed course of study is requisite for applicants and indispensable for students in the program.

Incoming students begin studies in the fall semester 2002. The student applying to enter in the fall of 2002 should have a complete dossier (application, transcripts, writing sample, letters of recommendation, and GRE scores) on file with Notre Dame’s Office of Graduate Admissions no later than the preceding January 15. The statement of intent accompanying the application should describe the student’s areas of interest as explicitly as possible and ideally should list the prospective faculty with whom he or she wishes to study. The writing sample should demonstrate the applicant’s skills in writing, analysis, and literary research. Proficiency in language ought to be demonstrated at this time.

Participating Faculty

The following is a partial list of Notre Dame faculty who came together to develop the Ph.D. Program in Literature. They form a core group of outstanding scholars who will be joined by numerous other faculty whose interests and expertise enable students to craft doctoral degrees responsive to their own particular interests in world literatures.


THEODORE J. CACHÉY JR., Professor of Romance Languages and Literatures and Director of the Devers Program in Dante Studies. B.A., Northwestern Univ., 1978; M.A., Univ. of California, Los Angeles, 1982; Ph.D., ibid., 1986. (1990)

SEamus DeANE, Donald and Marilyn Keough Professor of Irish Studies, Director of the Keough Institute for Irish Studies, and Professor of English. B.A., Queen’s Univ., Belfast, 1961; M.A., ibid., 1963; Ph.D., Cambridge Univ., 1966. (1993)


CHRISTOPHER R. FOX, Professor of English, Co-Founder of the Keough Institute for Irish Studies, and Fellow of the Reilly Center for the History and Philosophy of Science. B.A., Cleveland State Univ., 1971; M.A., State Univ. of New York, Binghamton, 1974; Ph.D., ibid., 1978. (1986)


VITTORIO HÖSLE, Paul Kimball Professor of Arts and Letters and Fellow of the Nanovic Institute for European Studies. Habilitation, Univ. of Tubingen, 1985; Ph.D., ibid., 1982. (1999)


ROBERT E. NORTON, Professor and Chair of German and Russian Languages and Literatures and Fellow of the Nanovic Institute for European Studies. B.A., Univ. of California, Santa Barbara, 1982; M.A., Princeton Univ., 1985; Ph.D., ibid., 1988. (1998)


D雅YL れ SEIDENSPINNER-NUÑEZ, Chair of Romance Languages and Literatures and Professor of Spanish. B.A., Univ. of California, Berkeley; M.A., ibid., 1971; Ph.D., Stanford Univ., 1977. (1997)

ALAIN TOUMAYAN, Associate Professor of Romance Languages and Literatures. B.A.,
In the structure of the program there is a strong emphasis on the history of philosophy. The major historical periods (ancient, medieval, and modern) are treated in depth both with regard to the general contours of these historical periods and in terms of the particular themes and tenets of the major philosophers within each. In practice the former is handled as a function of the latter: inasmuch as our students are expected to have had surveys of these periods as undergraduates, the graduate seminars on specific figures or themes are designed to develop and deepen an appreciation for historical context and for the philosophical issues that emerge. The role of the history courses is twofold. One aim of the courses offered in the history of philosophy is to enhance the students’ knowledge and appreciation of the basic works that have shaped our philosophical traditions so that their subsequent research and teaching will have a historical foundation as rich as possible. Of equal importance, however, is the development of these classical historical areas as foci of genuine research fields in their own right. Given its tradition and scope, the department is able to have a considerable number of people doing serious scholarly work in each of these historical periods. In addition it can draw on the resources of the Medieval Institute, the classics department, and the history department to supplement its efforts.

Though the primary goal of the graduate program has always been to produce broadly educated philosophers, the size of the department has also facilitated the development of a number of areas of special strength in research and teaching. At the present time, the department offers students with particular interests in any of the following fields unusual opportunities to work with a strong group of scholars in their area of specialization: philosophy of religion, medieval philosophy, philosophy of science, ethics, continental philosophy, metaphysics, and philosophy of math and logic. The fields of philosophy of mind, epistemology, logic, and contemporary analytic philosophy are also strongly represented. Special concentrations in medieval philosophy and in continental philosophy are available through the department. A joint Ph.D. in logic between the mathematics and philosophy departments is also possible. Graduate-level work in the history of science is available through the University’s graduate program in the history and philosophy of science. Students specializing in philosophy of science have the opportunity to incorporate a master’s degree from this program into their program of doctoral studies in philosophy. Students may also apply for admission to the special HPS philosophy track Ph.D.

In addition to a wide range of graduate courses (about 30 are offered each year), the department provides many other aids to the students’ philosophical development. The annual Ernan McMullin Perspectives in Philosophy series brings three or four prominent philosophers to campus. Each gives a public lecture and a conference is held on his or her work. In addition, there are many visiting lecturers in philosophy from other universities. Within the department, there is also a continuing series of weekly colloquia, where each Friday afternoon a faculty member or graduate student presents a paper in an informal setting with discussion following.

Finally, our students, with departmental support and outside funding, regularly visit distinguished philosophy departments both in the United States and abroad to undertake further study. Notre Dame graduate students have recently visited at Arizona, Brown, Cambridge, Oxford, Louvain, Gottingen, Tuebingen, and Münster.

There are six specialized institutes, the work of which is associated with that of the department. Kenneth M. Sayre directs the interdisciplinary Philosophic Institute, which has been supported by the National Science Foundation. The Medieval Institute has rich resources of medieval manuscripts, including a microfilm collection of the holdings of the famous Ambrosiana Library in Milan. Students may take specialized courses in paleography and medieval history offered by the institute. Ralph McInerny directs the Jacques Maritain Center, from which comes much of the work in English on Maritain. The Center for Philosophy of Religion, under the direction of Alvin Plantinga, hosts visiting fellows, sponsors conferences and symposia, and publishes a monograph series. The Reilly Center for Science, Technology, and Values, under the direction of Vaughn McKim, sponsors research, visiting lectures, and periodic conferences on value-related issues in science and technology. Finally, the Notre Dame Center for Ethics and Culture, headed by David Solomon, fosters research and teaching inspired by the ethical and political ideals embodied in Catholic social teaching.
A journal of international reputation is associated with the department, the *Notre Dame Journal of Formal Logic* (edited by Michael Detlefsen).

**Requirements for the Ph.D. in Philosophy**

Entering students are expected to have the equivalent of an undergraduate major in philosophy. If their major has been in another field they may still be admitted, but in such cases deficiencies may have to be made up on a noncredit basis at Notre Dame. Each applicant for graduate admission to the department is required to furnish, in addition to the materials requested by the Graduate School, a sample of the applicant’s written work in philosophy (approximately 10 to 15 pages in length).

For the doctorate a student must complete a 70 semester-credit-hour residency requirement (46 credit hours of graduate course work over two years and 24 credit hours, i.e., one full year, of dissertation research). Students who enter the doctoral program with an M.A. are normally excused from six to 12 credit hours of graduate course work. Any philosophy graduate student is permitted to take up to six credit hours of approved undergraduate course work in philosophy and up to six credit hours of course work in related fields to satisfy the 46 credit hours. Those who choose to concentrate in such specialized fields as logic and philosophy of science may be required to take courses in other departments in support of their specialization. Students are expected to maintain a minimum B average in all of their course work.

The faculty as a whole formally evaluates the progress of graduate students at the end of their first and second summers in the program. The first-year evaluation focuses on the students’ performance in courses and on the comprehensive exam in the history of philosophy, which is taken at the end of the first summer. The second-year evaluation focuses on the students’ performance in courses, as teaching assistants, and on the second-year research paper, which is completed by the end of the second summer. Students who have successfully completed the research paper then begin to prepare for an oral candidacy exam in an advanced field of philosophy, with the exam typically scheduled no later than the beginning of the first semester of the fourth year. After passing the oral exam, students submit a dissertation proposal, typically no later than the end of the fourth year. If the faculty judge at any stage that a student’s progress is unsatisfactory, the student may be required to terminate his or her graduate studies with an M.A. A student may receive a nonresearch M.A. degree in philosophy after finishing 30 credit hours of graduate course work and passing a special M.A. oral candidacy examination. The research M.A. is a 30-hour degree program requiring the preparation of a master’s thesis. A student may complete six of the 30 credit hours in research courses. (Continuing students may receive a nonresearch M.A. upon successful completion of the written Ph.D. candidacy examinations and 30 credit hours of graduate course work.)

**Course Requirements**

All doctoral students are expected to meet the following general course distribution requirements during their first two years of course work. (Each semester course is worth three credit hours.)

1. History of Philosophy
   - (a) Ancient Philosophy
   - (b) Medieval Philosophy
   - (c) Modern Philosophy
2. Metaphysics
3. Epistemology
4. Ethics
5. Philosophy of Science
6. Symbolic Logic

Course requirements in history of philosophy may be satisfied by taking any of a number of graduate courses offered in a historical area, though no course may be used to satisfy more than one general area requirement. Passing the Intermediate Symbolic Logic course (PHIL 513) satisfies the department’s graduate requirement in formal logic. Taking the core course in metaphysics, epistemology, ethics, and philosophy of science fulfills the requirements in those areas. Beginning students are encouraged to complete the requirements as early as feasible, consistent with their academic backgrounds and in consultation with the director of graduate studies. In addition to the courses listed above, graduate students are required to take a seminar in philosophy (PHIL 501) during their first semester, the colloquium seminar (PHIL 601 and 602) during their first year, and a practical seminar on teaching (PHIL 701) during their third year.

**Candidacy Examination**

The candidacy examination for the Ph.D. consists of two parts: (1) a written examination in the history of philosophy, and (2) an oral examination in the student’s chosen area of concentration.

The written examination is taken near the end of the summer following the first year of course work. Each student takes a six-hour examination in the history of philosophy (three hours covering ancient and medieval and three hours covering modern).

The second part of the candidacy examination consists of a one-and-one-half-hour oral examination by a board of five faculty examiners taken during a student’s third year of residence. This examination must be taken no later than one year following the completion of the research paper requirement. The purpose of the oral examination is to confirm a candidate’s readiness to begin significant research in his or her chosen area of concentration. Areas of concentration available in the department for the oral examination and for subsequent dissertation research include:

- ancient philosophy
- medieval philosophy
- modern philosophy
- ethics
- political philosophy
- philosophy of science
- philosophy of religion
- contemporary European philosophy
- metaphysics
- epistemology
- philosophy of mind
- philosophy of language
- formal logic
- philosophy of mathematics

**Language Requirement**

Acquiring the doctoral degree involves passing Graduate Reading Examinations in two foreign languages. At least one of these examinations must be completed before the oral candidacy examination is taken. Though German, French, Greek, and Latin are the standard choices, with the concurrence of the director of graduate studies, some other language may be substituted where the candidate’s dissertation is likely to require the use of the alternate language.

**Dissertation**

After completing the candidacy requirements and under the guidance of their chosen faculty advisers, doctoral candidates begin preparation of a written thesis.
proposal and representative bibliography for presentation to the thesis evaluation committee. This committee is an ad hoc board of five graduate faculty members appointed by the director of graduate studies to review the candidate’s proposal. A doctoral candidate is expected to incorporate into the proposal those committee members’ recommendations that, in their view, render it a viable and acceptable thesis project. This proposal is to be submitted and approved as soon as possible following completion of written and oral candidacy exams.

Having completed the doctoral candidacy requirements in the third year of residence and formulated an acceptable doctoral thesis proposal, the candidate is expected to complete and present a doctoral dissertation during the fourth or fifth year of residence.

Further information about financial aid opportunities, the department’s many programs and activities and its faculty is contained in the brochure Graduate Studies in Philosophy at Notre Dame, available by writing directly to the department.

**Course Descriptions**

Each course listing includes:

- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

These courses are representative of offerings in the program over a two-year period.

501. Proseminar (1-0-1) Stubenberg
Required of all first-year students. An introduction to the methods of graduate research in philosophy. (Fall)

601, 602. Colloquium Seminar (1-0-1) Staff
A one-hour seminar each semester tied to the talks given in the department’s ongoing colloquium series. Required of all first-year students.

**Area One: Ancient Philosophy**

516. Aristotle (3-0-3) Loux
An investigation of the central concepts of Aristotle’s philosophy with emphasis on his metaphysics. Aristotelian doctrines will be examined against the background of Platonic and pre-Socratic thought.

517. Aristotle’s Philosophical Anthropology (3-0-3) Loux
An examination of Aristotle’s views on problems in what we call the philosophy of mind and the theory of action. Texts to be read include Books I and II of the *Physics*, the *De Anima*, and large chunks of the *Nicomachean Ethics*, along with snippets from the *Parva Naturalia*.

525. Plato (3-0-3) Sayre
A textual study of selected middle and late dialogues, with concentration on the *Theaetetus*, the *Sophist*, the *Parmenides*, and *Philebus*.

**Area Two: Medieval Philosophy**

(See also Medieval Institute offerings)

519. The Medieval Theory of the Will (3-0-3) This course will trace the origin and evolution of the concept of the will from Anselm of Canterbury to Duns Scotus, focusing in particular on the emergence of voluntarism at the end of the 13th century, according to which the will became a completely self-determining, rational power.

522. Introduction to Plotinus (3-0-3) Gersh
A general survey of Plotinus’ philosophy based on writings of his early and middle periods, and a close study of Plotinus’ longest treatise (divided into four parts by Porphyry): *Enneads* III. 8, V. 8, V. 5, II.9.

523. Early Medieval Philosophy (3-0-3) Gersh
An introduction to medieval philosophy in the pre-scholastic period based on the reading of primary sources.

572. The Ethics of Thomas Aquinas (3-0-3) Freddoso
An examination of the relation among the main elements of St. Thomas’s general moral theory as laid out in the First Part of the Second Part of the *Summa Theologicae*, viz., the treatises on happiness, action, passion, habit, virtue, sin, law, and grace, and an exploration in more detail of certain specific aspects of these treatises.

561. The Moral Doctrine of Thomas Aquinas (3-0-3) McInerny
A lecture course in which the main features of the moral teaching of Thomas Aquinas will be systematically discussed. The *Summa theologiae*, *prima secundae*, and Thomas’s *Commentary on the Nicomachean Ethics* will be the principal sources.

**Area Three: Modern Philosophy**

531. Descartes (3-0-3) David
A close reading of Descartes’s major philosophical works: *Rules for the Direction of the Mind*, *Discourse on Method*, *Meditations on First Philosophy*, and *The Passions of the Soul*.

532. Leibniz, Newton, and Kant’s First Critique (3-0-3) Franks
A close examination of central aspects of Kant’s *Critique of Pure Reason*, considered as an attempt to resolve tensions between the model of intelligibility exemplified by Newton’s physics and the model of intelligibility articulated in Leibniz’s metaphysics.

533. Hume (3-0-3) Delaney
A careful reading of the *Treatise of Human Nature*.

536. Kant’s First Critique (3-0-3) Ameriks
An introduction to Kant’s philosophy with primary emphasis on the *Critique of Pure Reason*.

**Area Four: 19th- and 20th-Century Philosophy**

538. Hegel (3-0-3) Ameriks
A close study of the *Phenomenology of Spirit*, with special emphasis on Hegel’s epistemology and social theory.

543. Frege (3-0-3) Blanchette, Kremer
A study of Frege’s views about logic and language. Readings will consist primarily of Frege’s own writings on the subject, from his first presentation of his logical system in the *Begriffschrift* of 1879, to his last attempts to write a logic textbook in 1918. The study of Frege’s work will also be used to introduce fundamental themes and topics in philosophy.
in the philosophy of language.

545. Phenomenology
(3-0-3) Watson
Husserl’s development of transcendental phenomenology and Merleau-Ponty’s
reformation of it. Primary emphasis on Husserl through close reading of critical
texts.

547. Heidegger
(3-0-3) Watson
A close reading of Heidegger’s seminal work
Being and Time.

548. Contemporary Continental Philosophy
(3-0-3) Gutting, Watson
An examination of structuralist and post-
structuralist developments in contemporary
French philosophy.

549. Recent French Philosophy
(3-0-3) Gutting
Topics include: Sartre’s existentialism;
Merleau-Ponty, especially as critic of Sartre
and herald of Structuralism; a survey of the
structuralist ideas of Saussure, Lévi-Strauss,
Barthes, and Lacan; fairly comprehensive
looks at Foucault and Derrida; possibly
some attention to Lyotard, Deleuze, and
French feminism.

557. Wittgenstein: Tractatus
(3-0-3) Kremer
A careful reading of Wittgenstein’s
Tractatus Logico-Philosophicus.

560. Kierkegaard’s Existentialism:
(3-0-3) Niegorski
A seminar-style course focusing on the
reading and discussion of Yves Simon’s
Philosophy of Democratic Government, Leo
Strauss’s Natural Right and History, and Eric
Voegelin’s The New Science of Politics.
Special attention is given to the concepts
of history, science, nature, modernity, and
democracy itself as they appear in the three
works and related writings.

561. Kierkegaard
(3-0-3) McInerny
An examination of Kierkegaard with
particular reference to the works attributed
to his pseudonym Johannes Climacus.

563. Postmodern Analytic Philosophy
(3-0-3) Gutting
Distinctive forms of foundationalism,
logocentrism, and ahistoricism have
characterized modern philosophy from
Descartes through Kant and on to the
positivists and phenomenologists. This
course will explore the challenge to the
modernism of analytic philosophy by
Richard Rorty, Alasdair MacIntyre, Bernard
Williams, and Charles Taylor.

565. Kant’s Philosophy of Religion
(3-0-3) Quinn
An attempt to cover in some depth and
detail major themes in Kant’s philosophy of
religion including: the concept of God,
divine attributes, proofs for the existence
of God, the moral argument for freedom, the
postulates of immortality and God’s
existence, original sin and radical evil,
atonement and divine grace, saving faith
and the remarkable antimony, and
ecclesiology.

570. Philosophy and Christian Theism
(3-0-3) Plantinga
How, if at all, does Christian belief bear on
the traditional concerns of philosophers? Is
there such a thing as Christian philosophy?
After considering the bearing of some
common views of faith and reason on these
questions, we turn to more specific
questions in epistemology, ethics, and
philosophical anthropology.

571. Theories of Modernity
(3-0-3) Dallmayr
An attempt to chart a course through the
debates about the concept of “modernity.”
Beginning with a survey of some social
science literature on modernity and
modernization, the seminar turns to Jurgen
Habermas’s defense of modernity (as an
“unfinished project”) and to Charles
Taylor’s qualified defense. Discussion then
shifts to critics of modernity, from Strauss,
Voegelin, and MacIntyre to Adorno and
Derrida. Some attention will also be given
to non-Western critics of “Western”
modernity.

572. Kant’s Philosophy of Religion
(3-0-3) Watson
A seminar focusing on the task of evaluating
the developments of both thinkers in the
middle thirties in light of their respective
alterations of their prior accounts and the
mutual theoretical conflicts that result. The
bulk of the seminar will cover the works of
Husserl’s “Crisis” period and Heidegger’s
search for ‘a new beginning’ that culmi-
nated in the Beiträge (Contributions to
Philosophy).

574. Metaphysics of Creation
(3-0-3) Loux
Topics to be covered include the
metaphysics of modality, mind-body
problem, antirealism, and the nature of
natural laws. This is the core course for
metaphysics. (Each academic year)

575. Realism and Anti-Realism
(3-0-3) Loux
An examination of the debate at the
intersection of metaphysics and the
philosophy of language between realists and
anti-realists. The course will focus on the
work of four important Anglo-American
philosophers: Dummett, Quine, Putnam,
and McDowell.

576. Being
(3-0-3) van Inwagen
A seminar on the topic of ontology or the
philosophy of being. Questions to be
considered are the nature and meaning of
existence and being, the interpretation of
the so-called existential quantifier, non-
being, the ontology of fiction, the distinc-
tion between the abstract and the concrete,
nominalism and realism, the metaphysics of
possibility and necessity, the nature of
composite and enduring objects, the
concept of ousia or substance, and the
question why there should be anything at
all.

660. Metaphysics of Creation
(3-0-3) Burrell
The philosophical significance of creation and the proper manner of speaking of the relation between creator and creatures.

664. Topics in Philosophy of Mind
(3-0-3) Ramsey, Stubenberg
Study of selected issues of contemporary interest in the field.

667. The Metaphysics of Free Will
(3-0-3) van Inwagen, Warfield
An examination of the metaphysical implications of the thesis that human beings have free will.

Area Seven: Ethics, Political Philosophy, and Aesthetics

520. Locke's Moral Philosophy
(3-0-3) Shradar-Frechette
A careful, evaluative reading of Locke’s Letter Concerning Toleration, his Second Treatise on Civil Government, and his Questions Concerning the Law of Nature, as well as a more cursory look at his Some Thoughts Concerning Education.

569. 20th-Century Ethics
(3-0-3) Solomon, Sterba
A survey of a number of central positions and issues in contemporary ethical theory. The course will begin with an examination of the main metaethical positions developed from 1903 to 1970—intuitionism, emotivism, prescriptivism, and the various forms of ethical naturalism. This will provide a background for a discussion of issues arising from the more recent revival of classical normative theory. This is the core course for ethics. (Each academic year)

575. Kant’s Ethics
(3-0-3) Solomon
Detailed analysis of Kant’s ethical theory emphasizing close reading of the text and the exploration of recent critical literature.

576. The Ethics of Virtue
(3-0-3) Solomon
An examination of the distinctive character of an ethics of virtue in contrast to its deontological and consequentialist alternatives and a consideration and response to attacks against it by some contemporary moral philosophers.

577. Political Liberalism and Religion
(3-0-3) Quinn, Weithman
A consideration, from the point of view of philosophy and legal theory, of the question of whether religious arguments ought to be excluded from political debate on certain issues.

666. Consent and Ethical Theory
(3-0-3) Shradar-Frechette
An analysis of the role that free, informed consent plays in classical and contemporary social-contract theories of ethics. The course investigates: (1) the three main conditions for free informed consent (no coercion, knowledge, and competence); (2) the degree to which (and the conditions under which) consent is necessary or sufficient for altering moral boundaries among people; (3) the ethical relationships among consent, paternalism, and exploitation.

670. Consequentialism
(3-0-3) Warfield
A consideration of whether there is any limit at all on what morality can legitimately demand of an individual. Significant attention will be given to the claim that consequentialism permits too much in its pursuit of overall goodness.

677. Reason and Action: Thomism and its Rivals
(3-0-3) MacIntyre
What part do reason and desire play in the genesis of action? This course compares the answers given by modern decision theory, by Thomist Aristotelianism and by Lacan’s psychoanalytic theory.

Area Eight: Epistemology

562. Epistemology
(3-0-3) David, DePaul, Stubenberg, Warfield
The aim of this course is to survey and evaluate the major approaches to understanding epistemic value, viz., internalist theories such as coherentism and foundationalism, and externalist theories such as reliabilism. This is the core course for epistemology. (Each academic year)

642. Metaphysics
(3-0-3) Warfield
An analysis of metaphysical questions such as: Can objectivity be defended from relativism in various areas of inquiry? in ethics? in logic? in science? What role should “conceptual analysis” play in philosophy? in Metaphysics? in ethics? in philosophy of mind? Is philosophy just too hard for creatures like us? If so, what should we do?

662. Intellectual Virtues
(3-0-3) DePaul
An examination of the growing literature on virtue epistemology.

Area Nine: Philosophy of Science

581. Philosophy of Science
(3-0-3) Gutting, Howard, McKim
An analysis of the distinctive character of science as a complex mode of inquiry. Competing views on the nature of scientific explanation and the ontological import of scientific theory will be discussed in the context of classical and contemporary literature. (Each academic year)

583. Philosophy of Biology
(3-0-3) Moss
Central issues in the philosophy of science from the perspective of the life sciences with particular emphasis upon topics in evolutionary theory and sociobiology and upon the topic of intertheoretical integration in the life sciences (from organic chemistry to cognitive neuroscience). Topics to be covered include: teleology, reductionism and supervenience, the biological basis of cognition, explanation, scientific realism, theory change, and the critical appraisal of alternate research strategies.

584. Philosophy of the Human Sciences
(3-0-3) McKim
An inquiry into the tensions implicit in two competing models of social inquiry: that of the logical empiricists derived from reflection on the natural sciences and that of the humanistically oriented conception of historical studies that culminates in the notion of a Geisteswissenschaft.

585. Feminist Philosophy of Science
(3-0-3) Kourany
An exploration of the terrain of so-called “feminist philosophy of science” paying particular attention to articulating and assessing the theories. The course also explores the relation between this feminist philosophy of science and so-called “mainstream philosophy of science.”

587. History of the Philosophy of Science
(3-0-3) McMullin
Focus on Aristotle, Bacon, Descartes, Galileo, Newton, Vico, Whewell, and Poincaré. The connections between theory of science and epistemology will be emphasized, as will the influence of
metaphysics upon the origins of science.

588. History of the Philosophy of Science
1750 to 1900
(3-0-3) McMullin
The second half of the history of “classical” philosophy of science. Themes: the epistemic status of scientific knowledge-claims; the presuppositions, techniques, and modes of inference appropriate to natural science; the ontological status of scientific constructs. We shall begin with Reid and Kant, go on to Comte, Whewell and Mill, and end with Mach and Poincaré.

589. Religion and Science: Conflict or Concord
(3-0-3) Plantinga
A look at one of the most interesting and important topics of the last 500 years, the relation of the newly emerging modern science to religious belief—in particular Christianity.

674. The Question of Laws in Scientific and Ethical Thought
(3-0-3) Joy
A consideration of several influential accounts of laws of nature, including earlier treatments (those of Newton, Hume, Kant) and 20th-century treatments (those of Lewis, Armstrong, and critics of laws Cartwright and Van Fraassen). The course will then investigate what issues are at stake in a commitment to the coherence and existence of laws of nature. These issues concern the scientific study of nature, ethical inquiry regarding moral responsibility, and metaphysical disagreements about the compatibility of human freedom and causal determinism.

680. Scientific Realism
(3-0-3) McMullin
A consideration of the historical origins of the debate over scientific realism in early astronomy, in Newton’s mechanics, and in 19th-century philosophy of science. An examination of some of the major challenges to traditional realist assumptions issuing from recent physics, from philosophy of language, from Kuhnian theories of scientific change, and from sociology of science. Finally, a look at some recent formulations of a realist thesis that attempts to meet these challenges, and a consideration of where the balance may best be set between realism and antirealism.

686. Philosophy of Space and Time: Kant, Einstein
(3-0-3) Howard
An introduction to contemporary metaphysics and its relation to the philosophy of science. Three topics to be covered in depth: special relativity, the debate over relative and absolute space, and Kant’s views on space.

687. Interpretative Problems in Quantum Mechanics
(3-0-3) Cushing
Intended for graduate students in physics and in the history and/or philosophy of science who wish to examine in some reasonable detail the roots, both historical and philosophical, of quantum mechanics and the profound conceptual problems to which that theory has given rise.

513. Intermediate Logic
(3-0-3) Bays, Detlefsen, Kremer, Shin
An introduction to the basic principles of formal logic. The course includes a study of inference, formal systems for propositional and predicate logic, and some of the properties of these systems. The course will concentrate on proving some of the major results of modern logic, e.g., the completeness of first-order logic, the undecidability of first-order logic, the Lowenheim-Skolem theorems, and Gödel’s incompleteness theorems. (Spring)

541. The Origins of Analytic Philosophy
(3-0-3) Kremer
An examination of the origins of analytic philosophy focusing on the period roughly from 1890 to 1920. Emphasis will be on the development of characteristic analytic themes—the centrality of language and logic to philosophy, the resolution of philosophical problems through conceptual analysis, conflicts between atomistic and holistic tendencies, and the status of philosophy itself as doctrine and/or activity.

591. Gödel’s Theorems
(3-0-3) Detlefsen
A thorough examination of the technical background and proofs of Gödel’s theorems and related results. Application of this material to issues in philosophy of mind, philosophy of mathematics, and epistemology will also be considered.

592. Formal Semantics
(3-0-3) Shin
An examination of the analysis of meaning by applying logical theories to natural language. Starting with extensional semantics, we will move on to the intensional semantics and type theory. Next we will take up Montague Semantics as an intensional theory of types.

690. Workshop in Philosophy of Mathematics
(3-0-3) Bays
An ongoing research seminar in philosophical logic and the philosophy of mathematics. Topics likely to be covered include logicist accounts of arithmetic and analysis, the role of set theory in mathematics, the notion of a “foundation” for mathematics, and the nature of “logic.”

692. Truth, Relativism, and Idealism
(3-0-3) David
Beginning with an introduction to theories of truth, the course will turn to a consideration of Alethic Relativism, the view that truth is relative, and to the argument that says, very roughly, that truth cannot consist in a correspondence of thought with reality, for, it did, we couldn’t possibly know anything because we cannot access mind-independent reality.

694. Logic in Metaphysics and Metaphysics in Logic
(3-0-3) Blanchette
An introduction to some of the central logical techniques, theories, and claims frequently made use of by metaphysicians, and to some of the metaphysical issues that arise in the pursuit of logic.

Other Graduate Courses
599. Thesis Direction
(V-V-V) Staff
For students doing thesis work for a research master’s degree.

600. Nonresident Thesis Research
(0-0-1) Staff
For master’s degree students working in absentia.

601, 602. Colloquium Seminar
(1-0-1) Stuabenegger
A seminar meeting once a week to read and discuss materials coordinated with the department’s weekly colloquium series. (Every semester)

697. Directed Readings
Faculty


PATRICIA A. BLANCHETTE, Associate Professor, B.A., Univ. of California, San Diego, 1983; Ph.D., Stanford Univ., 1990. (1993)

JOSEPH BOBIK, Professor, B.A., St. Bernard’s College and Seminary, 1947; M.A., Univ. of Notre Dame, 1951; Ph.D., ibid., 1953. (1955)

SHEILA BRENNAN, Associate Professor Emerita, B.A., Laval Univ., 1950; M.A., ibid., 1951; Ph.D., ibid., 1952; Ph.D., ibid., 1954. (1971)


JAMES T. CUSHING, Professor of Physics and Professor of Philosophy, B.S., Loyola Univ., 1959; M.S., Northwestern Univ., 1960; Ph.D., Iowa State Univ., 1963. (1966)


CORNELIUS F. DELANEY, Professor, B.A., St. John’s Seminary, 1961; M.A., Boston College, 1962; Ph.D., St. Louis Univ., 1967. (1967)


THOMAS P. FLINT, Professor, B.A., St. Ambrose College, 1975; Ph.D., Univ. of Notre Dame, 1980. (1982)


GARY M. GUTTING, Professor, A.B., St. Louis Univ., 1964; Ph.D., ibid., 1968. (1969)


JANET KOURANY, Associate Professor, B.S., Columbia Univ., 1965; Ph.D., ibid., 1977. (2001)

MICHAEL J. KREMER, Associate Professor, B.A., Univ. of Toronto, 1980; M.A., Univ. of Pittsburgh, 1983; M.A., ibid., 1986; Ph.D., ibid., 1986. (1986)


ALASDAIR MACINTYRE, Senior Research Professor. B.A. Queen Mary College, 1949; M.A., Manchester University, 1951. (1988, 2000)

A. EDWARD MANIER, Professor, B.S., Univ. of Notre Dame, 1953; A.M., St. Louis Univ., 1956; Ph.D., ibid., 1961. (1959)

RALPH M. MCINERNY, Michael P. Grace Professor of Medieval Studies, B.A., St. Paul Seminary, 1951; M.A., Univ. of Minnesota, 1952; Ph.L., Univ. Laval, 1953; Ph.D., ibid., 1954. (1955)


REV. ERMAN McMULLIN, John Cardinal O’Hara Professor Emeritus of Philosophy, B.S., National Univ. of Ireland, 1945; B.D., Maynooth College, 1948; Ph.D., Univ. of Louvain, 1954. (1954)

LENNY MOSS, Assistant Professor, B.A., San Francisco State Univ., 1981; Ph.D., Univ. of California, Berkeley, 1989; Ph.D., Northwestern Univ., 1998. (1999)

DAVID K. O’CONNOR, Associate Professor, B.A., Univ. of Notre Dame, 1980; Ph.D., Stanford Univ., 1985. (1985)


WILLIAM M. RAMSEY, Associate Professor. B.S., Univ. of Oregon, 1982; Ph.D., Univ. of California, San Diego, 1989. (1989)
JOHN H. ROBINSON, Director of the Thomas J. White Center for Law and Government, Associate Fellow in the Law School and Concurrent Assistant Professor of Law and Philosophy. B.A., Boston College, 1967; M.A., Univ. of Notre Dame, 1972; Ph.D., ibid., 1975; J.D., Univ. of California, Berkeley, 1979. (1981)
WILLIAM D. SOLOMON, Associate Professor. B.A., Baylor Univ., 1964; Ph.D., Univ. of Texas at Austin, 1972. (1968, 1977)
REV. CHARLES WEIHER, C.S.C., Assistant Professor Emeritus. B.S., Univ. of Notre Dame, 1942; M.A., ibid., 1956; Ph.D., ibid., 1960. (1956)

Romance Languages and Literatures

Chair: Dayle Seidenspinner-Nuñez
Director of Graduate Studies: Theodore Cachey
Telephone: (219) 631-6886
E-mail: romlang@nd.edu
(www.nd.edu/~romlang)

The Program of Studies

The Department of Romance Languages and Literatures offers an M.A. degree in French and Francophone Studies, Italian Studies, and Iberian and Latin American Studies. The primary aim of the master’s program is to provide students with a comprehensive background in the literary and cultural achievements of French-, Italian-, and Spanish-speaking countries, both separately and in relation to each other. Additionally, the master’s program may, with the permission of the department, include advanced courses in related areas of other disciplines, such as art, English, government, history, international studies, music, philosophy, psychology, and theology. Indeed, in the Italian studies program, such allied courses are considered an integral component of the student’s preparation. This interdisciplinary and comparative approach to the romance literatures is a hallmark of the master’s program. The various courses of study provided will, in most instances, lead to a career in teaching and scholarship, but they may also serve as fundamental training for those candidates who plan to enter professions where a knowledge of romance languages plays an auxiliary role.

Admissions

Graduate study in French and Francophone Studies, Italian Studies, or Iberian and Latin American Studies assumes a prior undergraduate major or its equivalent in the respective field. All applicants are required to take the Graduate Record Exam; in addition, if English is neither the applicant’s native language or language of instruction, the applicants must also submit TOEFL scores. In addition to the materials required by the Graduate School, the applicant should submit a writing sample and an audiocassette tape to demonstrate the applicant’s ability in the target language; if the applicant is a non-native speaker of English, an audiocassette tape in English should be forwarded as well.

General Requirements

The master’s programs encourage the student to work closely with his/her advisor to design a course of study to suit individual needs, interests, and future goals. All candidates for an advanced degree are expected to take a minimum of 30 credit hours of courses in their field of specialization, including LLRO 510 (Introduction to Literary Criticism) and a graduate course in comparative romance literature.

During the second semester of the first year of graduate study, the student must pass an oral qualifying examination. The master’s candidate will choose from a selection of texts and must demonstrate competency in analyzing a literary text in the target language before the graduate faculty. At this time, faculty members will discuss and evaluate the student’s performance in the master’s program.

Before taking the comprehensive written examination at the end of the second year, the student must demonstrate competency in a second foreign language by passing the Graduate Reading Examination. All students are encouraged to fulfill the departmental language requirement by studying a second romance language.

Students preparing for a career in teaching have the opportunity to teach several language courses before completion of the master’s degree. A preliminary workshop, LLRO 501 (Methods of Foreign Language Teaching) and LLRO 501L (Practicum in Teaching) are required of all graduate teaching assistants.

Program in French and Francophone Studies

Course requirements. All candidates for a master’s degree in French and Francophone Studies are required to take a minimum of 30 credit hours or ten courses. LLRO 510 (Introduction to Literary Criticism), required of all students, is taken during the first semester of residence. In addition, the minimum of ten courses includes at least six
courses in French and Francophone literature and one course in comparative romance literature. Two courses may be in a second national literature or in an allied field; students taking both courses in the same national literature or in comparative literature will be designated as having fulfilled a minor in that field. Occasionally, at the invitation of the program faculty, these two courses may instead be fulfilled by writing a master’s thesis under the direction of a faculty member in the department. Two of the ten courses may be at the 400 level.

Comprehensive Master’s Examination. For the final written examination, the student chooses five of seven fields (medieval, renaissance, 17th century, 18th century, 19th century, 20th century, Francophone) in which to be examined. Each area will be tested for a total of one hour.

Combined B.A./M.A. Program in French and Francophone Studies. 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 at the 200-level or above 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 in residence. Six credit hours will be counted toward both the undergraduate and the graduate degrees. During their senior year, participants in this program complete 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 liaison in Spanish at the beginning of their junior year.

Program in Italian Studies
Course requirements. All candidates for a master’s degree in Italian Studies are required to take a minimum of 30 credit hours or ten courses. LLRO 510 Introduction to Literary Criticism), required of all students, is taken during the first semester of residence. The minimum of ten courses includes four to six courses in Italian literature (two of these courses may be taken at the 400-level) and one course in Comparative Romance Literature. The remaining credit hours will be fulfilled through Italian studies courses in history, art history, philosophy, music, architecture, and comparative literature.

Comprehensive Master’s Examination. The written master’s examination is four hours in length and covers the following areas: Medieval, Renaissance, 17th and 18th centuries, 19th century and 20th century. The exam tests the candidate’s knowledge of two areas of concentration and competency in the remaining fields.

Program in Iberian and Latin American Studies
Course requirements. All candidates for a master’s degree in Iberian and Latin American Studies are required to take a minimum of 30 credit hours or ten courses. LLRO 510 Introduction to Literary Criticism), required of all students, is taken during the first semester in residence. The minimum of ten courses includes at least six courses in Iberian and Latin American literature and one course in Comparative Romance Literature; when appropriate, a course in art, history, philosophy or another allied field may substitute for the Comparative Romance Literature course with permission. Two of the ten courses may be at the 400 level.

Comprehensive Master’s Examination. The final written examination is eight hours in length and administered in four two-hour sessions over two days. The examination comprises the following eight fields: medieval, Golden Age, 18th- and 19th-century peninsular, 20th-century peninsular; colonial Latin American, 19th-century Latin American, Latin American literature 1880-1950, and 1950 to the present.

Comprehensive Master’s Examination. The written master’s examination is four hours in length and covers the following areas: Medieval, Renaissance, 17th and 18th centuries, 19th century and 20th century. The exam tests the candidate’s knowledge of two areas of concentration and competency in the remaining fields.

Course Descriptions
Each course listing includes:
– Course Number
– Title
– (Lecture hours per week– laboratory or tutorial hours per week– credits per semester)
– Instructor
– Course Description
– (Semester normally offered)

The Department of Romance Languages and Literatures offers courses in a three-year cycle. While an individual course may not be offered each year, courses that cover the area of specialization are offered within the two years that it takes to complete the degree requirements.

Romance Literatures
501. Foreign Language Acquisition and Instruction
(1.5-0-1.5) Farley
An introduction to theories of foreign language acquisition and methods of foreign language instruction related to them, including the direct, cognitive, communicative, and input (natural) approaches. Required of teaching assistants in the department.

501L. Practicum in Teaching
(1.5-0-1.5) Farley, Fisher-McPeak, Ryan-Scheutz
Lab session for 501 for the practice of strategies taught in 501 and their implementation in courses taught by teaching assistants. Open only to teaching assistants in the department.

510. Introduction to Literary Criticism
(3-0-3) Douthwaite, Heller, Toumayan
Various trends of modern literary criticism as they relate to the study of romance literatures. Required for all M.A. students in romance languages and literatures.
519. Literature and History of Travel
(3-0-3) Cachey
An exploration of the role of travel in the construction of Western European identity and of the interactions of travel and literature in forming that identity. The discussion of travel ranges from Gilgamesh to global tourism and considers exemplary texts of the medieval period as well as from national literatures during the Renaissance, baroque, Enlightenment, and post-Enlightenment periods.

520. Paleography
(3-0-3) Boulton
An introduction to Latin paleography from the beginnings of Latin writing to about A.D. 1500. Classes will consist of lectures on the developments of handwriting over the course of this period and special emphasis will be given to practical exercises in reading various hands and to the technique of describing medieval manuscripts.

521. The Medieval Romance
(3-0-3) Boulton
By examining representative English, French, German, and Italian romances of the 12th and 13th centuries and a selection of critical works, the course will attempt to define the characteristics and the narrative techniques of the medieval romance.

531. Lyric Poetry of the Renaissance
(3-0-3) Della Neva
A study of Petrarch’s Rime sparse, Maurice Scève’s Délire, and Shakespeare’s Sonnets.

551. Dialogues Across the Channel: French, English and Irish Women Writers, 16th through 19th Century
(3-0-3) Douthwaite
Using the tools of literary history, feminist theory, and women’s social history, students will analyze the works of French, English, and Irish women writing in the period 1654 to 1846 and chart the exchange of literary themes and ideas between national traditions. Authors include Lafayette, Burney, Morgan, Shelly, and Sand.

570. Film and Literary Interactions
(3-0-3) Welle
The historical interactions of film and literature in Western Europe including Expressionism, Dadaism, Futurism, and Surrealism.

585. Modern Italian Poetry and Translation Studies
(3-0-3) Welle
The historical development of modern Italian poetry and an introduction to translation studies.

French Studies
505. History and Fiction, Scudéry to Tocqueville
(3-0-3) Douthwaite
This course studies two textual traditions, fiction and historiography, as interrelated genres in the period 1654 to 1856. Theoretical readings in intellectual, social, and cultural history will orient literary discussions. Authors studied include Bossuet, Mme de la Guette, Prévost, Perrault, and Michelet.

522. Readings in Old French
(3-0-3) Boulton
An introduction to the language and literature of medieval France. We will read a variety of texts in verse and prose composed in the 12th, 13th, and 14th centuries.

523. Lyric and Narrative in Medieval French Literature
(3-0-3) Boulton
A study of narrative transformations of the themes of the courtly lyric in the 13th and 14th centuries.

528. Medieval Romance: Chrétien de Troyes
(3-0-3) Boulton
An examination of Chrétien’s evolution as a writer, his treatment of the Arthurian legend, and the conventions he established for the genre.

530. Love Poetry of the Renaissance
(3-0-3) Della Neva
An in-depth reading of the love lyrics of Ronsard, Du Bellay, and Maurice Scève, particularly as they relate to the Italian Petrarchist tradition.

541. Racine et la Critique Moderne
(3-0-3) MacKenzie
Racine’s tragedies as seen through the optic of the critical methods espoused, for example, by Barthes (structuralism), Goldmann (Marxism), and Mauroz (psychoanalysis).

542. Autour/Auteurs de Port-Royal
(3-0-3) MacKenzie
In this seminar we will examine the works of writers who either literally or by association espoused a Jansenist viewpoint. Authors include Pascal, La Bruyere, Lafayette, and Racine.

543. Pascal
(3-0-3) MacKenzie
An in-depth investigation of the scientific, polemical, and apologetic works of Blaise Pascal.

552. Metamorphoses in Prose: 17th to 19th Centuries
(3-0-3) Douthwaite
The diverse origins and developments in French narrative fiction from the 17th to the early 19th century. Pertinent aspects of French social, cultural, and political history will be examined along with literary texts, by authors such as d’Urfé, Lafayette, Graffigny, Diderot, and Hugo.

562. Literature of the Fin-de-Siècle and the Belle Époque
(3-0-3) Perry
A study of all of Flaubert’s published prose works. We will also consider selections from his Carnets, his Voyage en Egypte, and his correspondence. Special attention will be given to problems of literary history, narrative genre, and style.

565. Baudelaire and the Symbolists
(3-0-3) Toumayan
A study of the poetry of French symbolists with special attention to the works of Baudelaire, Mallarmé, Rimbaud, and Verlaine.

571. Modern French Poetry from Symbolism through Surrealism
(3-0-3) Perry
The modern development of the notion of the poet as visionary writer, as reflected in verse and prose poetry from Baudelaire to the surrealists and beyond.

578. Proust: A World Lost and Regained
(3-0-3) Perry
Proust not only recovered a world through his creative exploration of memory but he also established a new type of novel, in which poetic prose alternates with the criticism of art, history, society, politics, and psychology. The semester is dedicated to reading several volumes from Proust’s monumental work, A la Recherche du temps perdu.
591. Politics and Literature in Francophone sub-Saharan Africa
(3-0-3)
The relationship between politics and literature in Francophone sub-Saharan Africa from the 1920s to the present, the manner in which literary texts have reflected historical and political changes, and their role in perpetuating, exposing or undermining the colonial or postcolonial political elite.

592. The Black Mediterranean: Maghreb and Beur Literature
(3-0-3)
A study of French colonial contact with North Africa, of writings by Algerian, Moroccan, and Tunisian authors, and of the emergence of works produced by the descendants of North African immigrants in France. Authors include: Ben Jelloun, Djebbar, Boudjedra, Begag, Charef, and Belghoul.

599. Thesis Direction
(V-V-V) Staff
For students doing thesis work for a research master’s degree.

600. Nonresident Thesis Research
(0-0-1) Staff
For master’s degree students working in absentia.

697. Directed Readings
(V-V-V) Staff
Italian Studies
501. Italian Language Acquisition
(3-0-3) Ryan
An overview of current thinking about second-language acquisition theories and methods, with particular emphasis on their application in the Italian language classroom.

503. The Italian “Questione della Lingua” and the Renaissance History of the Book
(3-0-3) Cachey
An advanced introduction to the history of the Italian language from Le origini to the High Renaissance with special emphasis on Dante, Petrarch, and Boccaccio during the medieval period and Bembo, Castiglione, and Machiavelli for the Renaissance.

509. The Italian Lyric
(3-0-3) Moevs (in Italian)
A close textual analysis of selected lyric masterpieces from the breadth of the Italian tradition, from Cavalcanti to Montale. The course is designed to deepen the students’ appreciation of poetry and poetic craft, to develop their confidence in approaching and mastering poetic texts, and to acquaint them with the greatest poetic voices of Italian literature.

520. Topics in Medieval and Renaissance Literature
(3-0-3) Cachey, Moevs
A study of the genres, movements, and major writers of the medieval and Renaissance periods. The course varies from year to year but past topics have included Boccaccio, lyric poetry, Dante’s Paradiso, Petrarch, Machiavelli, and Ariosto.

525. Dante
(3-0-3) Cachey, Moevs
A focus on three overarching themes: (1) Dante’s poetics, (2) Dante’s “minor” works and(3) Dante’s reception, especially contemporary critical reception in North America.

531. Petrarch and Boccaccio
(3-0-3) Cachey, Moevs
An extensive and intensive reading of the Canzoniere and the Decameron, together with lesser works of the masters.

535. La letteratura di viaggio: storia e critica
(3-0-3) Cachey
The problematic place of travel within the context of Italian literary history and the relationship of travel to the category of the literary itself is studied in primary source texts of the medieval, Renaissance, and modern periods.

536. Classics of the Italian Renaissance
(3-0-3) Moevs
Five literary classics and the critical discourse surrounding them, including Poliziano’s “Stanze per la giostra,” Sannazzaro’s Arcadia, Machiavelli’s II Principe, Castiglione’s Cortegiano, and Ariosto’s Orlando Furioso.

549. Age of Casanova: 18th-Century Europe
(V-V-V) Staff
A close reading of the Promessi Sposi in its historical and cultural context, with special attention focused on its artistic and social aims as a novel at once historical, political, and self-consciously Catholic.

570. 20th-Century Italian Women Writers
(3-0-3) Ryan
This course examines the development of female discourse in novels of this century, starting with a text by Nobel Prize winner Grazia Deledda and ending with best-selling contemporary author Susanna Tamaro. We will trace and identify the subtleties and variations among women’s voices that are slowly establishing more prominent positions within the Italian literary canon.

Class discussions, presentation, and writing assignments will examine themes such as childhood, adolescence, and motherhood; feminist movements in Italy and gender roles within certain historical contexts; and the varied nature of relationships between women and men, or women and other women.

580. What Is Popular Literature?
(3-0-3) Welle
A historical examination of modern and post-modern literary forms in Italy from the beginning of the 19th to the end of the 20th century. Emphasis on the historical novel, melodrama, and the feuilleton; crime, detective, and mystery novels; romances, the film-novel, the foto-romanzo, the fumetto, and the e-zine.

581. The Emergence of Cinema
(3-0-3) Welle
This course represents a historical analysis of the emergence of cinema in France, Italy, and the United States before 1920. Lectures will emphasize the development of film genres, modes of production, institutions, styles, film culture, and cinema and society.

582. History of Italian Cinema I: 1895 to 1943
(3-0-3) Welle
Traces the development of silent film, the transition to sound, and film under fascism, with particular emphasis on film’s relationship to theater, literature, spectacle, and social and cultural history.

585. Modern Italian Poetry and Translation Studies
(3-0-3)
The historical development of modern Italian poetry and an introduction to translation studies.
A close analysis of genres, spectatorship, directors, movements, and theoretical issues from neorealism to Italian television in the 1990s.

The evolution of the picaresque novel in Europe from two points of view: as a first-person narrative that deals thematically with Europe from two points of view: as a first-person narrative that deals thematically with

A study of the development of the novel as an artistic genre in 20th-century Spain, from the Spanish-American War of 1898 to modern Spain examined within the context of the social, political, aesthetic, and intellectual crisis of the times in which they were written.

The course includes a study of the theatre (mainly that of Lorca) and the poetry of the generation of 1927, with especial emphasis on the metaphorical experiments of these poets, their stylistic development, thematic preoccupations, and personal aesthetic credos. These aspects will be studied against the cultural, historical, and social background of their time and country.

The aesthetics and poetics of movements such as cubism, expressionism, dadaism, surrealism, and futurism studied in relation to the most representative literary works of the first three decades in Spain.

543. 20th-century Spanish Novel
(3-0-3) Jerez-Farrán
A study of the development of the novel as an artistic genre in 20th-century Spain, from the Spanish-American War of 1898 to modern Spain examined within the context of the social, political, aesthetic, and intellectual crisis of the times in which they were written.

544. High Renaissance and Mannerist Art
545. Italian Baroque
549. 18th-Century European Art
571. 20th-Century Italian Architecture and Design
583. Urban Space of Italy
584. Politics and Culture
586. Culture in Italian Cities
599. Thesis Direction
(3-0-3) Jerez-Farrán
A study of the development of the novel as an artistic genre in 20th-century Spain, from the Spanish-American War of 1898 to modern Spain examined within the context of the social, political, aesthetic, and intellectual crisis of the times in which they were written.

546. Generation of 1927: Theatre and Poetry
(3-0-3) Jerez-Farrán
The course includes a study of the theatre (mainly that of Lorca) and the poetry of the most representative poets of the so-called generation of 1927, with especial emphasis on the metaphorical experiments of these poets, their stylistic development, thematic preoccupations, and personal aesthetic credos. These aspects will be studied against the cultural, historical, and social background of their time and country.

570. Spanish American "Modernismo" and the Modernization of Spanish America
(3-0-3) Olivera-Williams
Studies, through representative works, the aesthetic sensibility in the Spanish American world during the 1880s to the 1910s, a period in which the new Latin American nations were experiencing a process of modernization.

571. Creating a Nation / Creating a Woman
(3-0-3) Olivera-Williams
An in-depth study of the most representative works by male and female authors of the 19th-century Spanish American literature. The main focus of the seminar analyzes how these works establish an intertextual dialogue to create images of nation and woman.

574. Topics in Southern Cone Literature
(3-0-3) Olivera-Williams
A study of representative movements and authors of 20th-century Southern Cone (Argentina, Chile, and Uruguay) literature through an examination of their aesthetic tendencies and sociohistorical contexts.

583. Modern Spanish American Novel
(3-0-3) Ibsen
Studies, through representative works, the modern aesthetic, cultural, and historical tendencies that characterize the 20th-century Spanish American novel.

585. Towards a New Spanish American Theater
(3-0-3) Ibsen
A study of representative movements and authors of 20th-century Mexican literature through an examination of their aesthetic tendencies and sociohistorical contexts.

587. Topics in Mexican Literature
(3-0-3) Ibsen
A study of representative movements and authors of 20th-century Southern Cone Mexican literature through an examination of their aesthetic tendencies and sociohistorical contexts.

588. Spanish-American Short Story
(3-0-3) Ibsen
An overview of the principal tendencies of short narrative in 20th-century Spanish America, as well as major trends in narratological theory. Among the authors discussed are Horacio Quiroga, Jorge Luis Borges, Julio Cortázar, Rosario Ferré, Antonio Skármeta, and Luis Valenzuela.

590. 20th-century Literature of the Hispanic Caribbean
(3-0-3) Anderson
This course offers a comprehensive overview of contemporary Cuba, Puerto Rico, and the Dominican Republic. Special attention is given to questions of national identity and to the themes of moral, social, and political decay. Critical and theoretical works accompany the reading of primary texts on a number of related topics. Authors studied in this course include Gabriel García Márquez, Luis Rafael Sánchez,
Guillermo Cabrera Infante, Reinaldo Arenas, Rosario Ferré, Juan Bosch, and others.

593. Studies in Colonial Literature
(3-0-3) Anadón
The development of narrative forms in Latin America. Examples of different prose works are studied: chronicles, humanistic histories, and letters. Special attention is given to the emergence of the novel.

596. The Historical Novel in Latin America
(3-0-3) Anadón
The concepts of “history” and “fiction” are examined in relation to Latin American historical novels. The Tragicomedia de don Enrique de Castro, considered to be the earliest example of this genre, is studied first, but the main emphasis is placed on more recent texts.

Faculty

José Anadón, Professor of Spanish Language and Literature. B.A., Albion College, 1968; M.A., Univ. of Michigan, 1970; Ph.D., ibid., 1974. (1975)


Paul F. Bosco, Associate Professor Emeritus of Italian Language and Literature. A.B., Wayne Univ., 1934; M.A., Harvard Univ., 1955; Ph.D., ibid., 1942. (1947)


Andrew Farley, Director of the Spanish Language Program and Assistant Professor of Spanish Language and Literature. B.A., Furman Univ., 1994; M.A., Univ. of Georgia, 1996; Ph.D., Univ. of Illinois at Urbana-Champaign, 2000. (2001)


Kristine L. Ilsen, Associate Professor of Spanish Language and Literature. B.A., California State Univ., Fullerton, 1983; M.A., Univ. of California, Los Angeles, 1984; Ph.D., ibid., 1991. (1992)

Carlos Jerez-Farrán, Associate Professor of Spanish Language and Literature. B.A., Univ. of Sheffield, 1980; M.A., Univ. of Massachusetts at Amherst, 1983; Ph.D., ibid., 1987. (1986)


María Rosa Olivera-Williams, Associate Professor of Spanish Language and Literature. B.A.S., Univ. of Toledo, 1976; M.A., Ohio State Univ., 1978; Ph.D., ibid., 1983. (1982)


Dayle Seidenspinner-Núñez, Chair and Professor of Spanish Language and Literature. B.A., Univ. of California, Berkeley; 1968; M.A., ibid., 1971; Ph.D., Stanford Univ., 1977. (1997)


Theology

Chair:
John C. Cavallini

Director of Graduate Studies:
Jean Porter

Director of M.A./M.T.S. Programs:
Randall Zachman

Director of M.Div. Program:
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The Master of Arts Program
The master of arts in theology is designed to provide graduate-level training in theology through one of several areas of study within the department. It offers a well-defined and yet flexible educational program that allows for a diversity of goals of individual students. It is also sensitive to the professional and pastoral context of the educational interests of the candidates.

The M.A. in theology is designed to serve the following constituencies:

—those seeking to teach theology at the high school level;
—those seeking to serve the church or diocese in an enhanced capacity;
—those seeking theological training to augment their work in other professional contexts (i.e., hospitals, social work, etc.).

Those seeking to go on for doctoral work in
theology should apply to the M.T.S. program.

Applicants must have GRE scores of 1500 or better and at least six courses for credit in theology or religious studies on their official transcripts.

Program Description:
The M.A. in theology is a 30 credit-hour degree, consisting either of two classes in the summer session and eight courses during the academic year; or of classes in consecutive summer sessions.

There are six areas of concentration for the M.A. in theology: biblical studies, history of Christianity, liturgical studies, moral theology, spirituality (summers only), and systematic theology.

Apart from liturgical studies, an area of concentration is normally constituted by:
—five courses in the area of concentration;
—one course each in four other areas;
—one free elective.

Liturgical Studies
Basic Requirements (21 credits) liturgical history, liturgical theology, ritual studies, eucharist, Christian initiation, liturgical prayer, liturgical year
Electives (nine credits)

Only one course in the area of concentration should be taken in the summer for academic year M.A. students. There are no required courses for any of the areas of concentration except for liturgical studies. However, those planning to teach in high school should take THEO 557: Educating in Faith: Catechesis in Catholic Schools, during their summer course work.

Those needing a more general and flexible program of studies may pursue a general M.A., in which the course of study is worked out in consultation the director of the M.A. program, with the sole requirement being at least one course in each area of study. This may be of particular interest to those teaching theology in high school who wish to use the M.A. to enhance their effectiveness in teaching in a number of different areas.

Master’s Colloquium
The master’s colloquium is designed both to familiarize M.A. students with the methods and content of the five areas of theological study and to develop integrative skills regarding the five areas of theological investigation. A faculty member and a student lead each colloquium from one of the five areas, presenting a topic of interest to the colloquium and leading the ensuing seminar discussion. Attendance is mandatory for all M.A. students.

Comprehensive Exams
In the last semester of course work, students should prepare five questions that they would like to explore in the comprehensive exams. These questions will guide both the student and the adviser in the construction of exam bibliographies. The student should then meet with the area adviser to refine these questions and construct her/his bibliography, drawing from the five annotated bibliographies provided by each area. A bibliography should be made up of 20 books, with 12 books from the bibliography in the area of concentration and two books from each of the other four areas. The bibliography should also contain five recent journal articles, so that students become acquainted with the journals in their field of study. The bibliographies must be approved both by the area adviser and the M.A. director no later than one month before the student hopes to take exams. M.A. exams are given in the first week of November, April, and July. Students must be enrolled and registered for a thesis research class during the semester they plan to take their exam.

The exam board, to be chosen by the M.A. director in consultation with the area adviser, will be made up of two faculty from the area of concentration, and one faculty from another area. Students pursuing the general M.A. degree may have an exam board chosen from three different areas. The student may confidentially choose the inclusion of one member of the board (subject to availability), and the exclusion of one faculty member. Each member of the exam board will submit three questions, framed in light of the five questions proposed by the student, to the area adviser, who will then formulate five questions, and submit them to the M.A. director for final approval.

The comprehensive exams themselves are made up of written and oral exams. The student will be asked to answer three of the five questions during the four-hour written exams, given on the Monday of exam week. These written answers will then be distributed to the board, and will form the basis of the forty-minute oral exam on Wednesday or Thursday of the same week. During the oral exams, questions not answered by the student on the written exam may be addressed, as may books on the bibliography and courses taken by the student. Evaluation of the student’s performance will be made on the basis of both the written and oral exams.

The Master of Theological Studies Program
The Master of Theological Studies (M.T.S.) is specifically designed to train graduate students for future doctoral work in the various disciplines within the study of theology. The M.T.S. is a 48-credit-hour degree, designed to give students exposure to the full range of theological studies, while also allowing them to develop competence in an area of concentration. Along with two years of full-time course work, the M.T.S. also includes participation in the master’s colloquium, competency in one modern language, and a comprehensive oral exam to be given at the end of the second year of course work. Biblical studies and history of Christianity also have ancient language requirements.

In order to introduce every M.T.S. student to the full range of theological education, every M.T.S. student must take at least six credit hours in biblical studies, six in the history of Christianity, three in liturgical studies, three in moral theology, and three in systematic theology. There are five areas of concentration. Students must take at least 15 credit hours in the area of their concentration.

Areas of Concentration
Biblical Studies
The concentration in biblical studies involves 15 credit hours in biblical studies, six in history of Christianity, three in liturgical studies, three in moral theology, and three in systematic theology. In place of electives, biblical Studies students will take nine credit hours in one ancient language (Greek, Hebrew, or Latin) and nine credit hours in another ancient language.

History of Christianity
The concentration in history of Christianity involves 15 credit hours in history of Christianity (with the possibility of three to be taken outside the department), six in biblical studies, six in systematic theology, and three in liturgical studies, and three in moral theology. Six credit hours will normally be devoted to the study of ancient languages. Nine credit hours will be electives, distributed according to the interests of the students, and may include
The Master of Divinity (M.Div.) is a professional theological degree designed to prepare students for learned and effective ministry in the Roman Catholic Church. The studies of scripture, the history of Christian tradition, systematic theology, liturgy, and Christian ethics are joined to field experience and training in pastoral skills to form a comprehensive ministerial curriculum.

The University of Notre Dame is a special setting for an M.Div. program. The intellectual opportunities and challenges of a major teaching and research university are appropriate backdrops for pastoral studies. Notre Dame is a crossroads for people and programs touching church life, as it attracts representative figures from dioceses and religious movements in all parts of the United States. There is an extensive, well-conceived campus ministry program with its spectrum of liturgical and pastoral opportunities. The Institute for Church Life offers programs in continuing education for bishops, priests, and religious leaders, as well as national programs in liturgy training. The Center for Social Concerns sponsors many educational initiatives in social justice and direct service to the poor. Because of the size of the Department of Theology at Notre Dame and the significant number of visiting professors, a wide offering of courses is available in all areas of theology.

The M.Div. program includes a variety of students: members of the Congregation of Holy Cross studying for the priesthood, laywomen and laymen, and members of religious congregations. With this community of students, the University furthers the expansion and diversification of ministry and fosters a realistic and helpful context for ministerial education.

The Program of Studies
The program of studies leading to the Master of Divinity degree normally extends over six semesters and encompasses 76 hours. Students may use additional semesters to acquire further theological depth. Credit requirements are usually allocated in the following way:

- Biblical studies: 12 hours
- Historical studies: 6 hours
- Systematic theology: 12 hours
- Christian ethics: 6 hours
- Canon law: 3 hours
- Liturgy: 6 hours
- Field education: 10 hours
- Pastoral studies: 13 hours
- Electives: 6 hours
- Synthesis seminar: 2 hours

The studies of scripture, the history of Christianity, systematic theology, liturgy, and Christian ethics are joined to field experience and training in pastoral skills to form a comprehensive ministerial curriculum.
Field Education
Contemporary life is a source of theology as well as the milieu of ministry. The field education program provides an initial joining of service with theological reflection.

To facilitate theological integration and personal appropriation, the field education program consists of: (1) weekly work in parishes, hospitals, and social agencies; (2) regular individual supervision with a competent authority at this place of work; and (3) weekly seminars at the University in which students analyze case studies based on their work and discuss issues of importance relative to active ministry in the Church today. This threefold process unites with the students’ concurrent studies in scripture, history, and systematic theology to enable them to develop a professional identity in ministry.

John S. Marten Program in Homiletics and Liturgics
Inaugurated in 1985 through an endowment by the John S. Marten family, this program annually offers courses in both homiletics and liturgical celebration for students whose ministry will involve the preaching of God’s word and leadership in worship. Through the Marten program, M.Div. students benefit from symposia and workshops on preaching in contemporary society, and the program occasionally hosts a visiting professor to offer additional courses in those areas. The vision and generosity of the Marten family ensure the continuance of deep spiritual renewal of local faith communities—a major thrust of Vatican II—and adds a significant dimension to theological education at Notre Dame.

Lay Ministry and Seminary Formation
The Lay Ministry Formation Program is a critical part of the comprehensive curriculum of the M.Div. degree. Students preparing for lay ministry participate in weekly prayer, celebration of the Eucharist, and monthly meetings that focus on topics pertaining to the personal, professional, spiritual, and professional development of the aspiring lay minister. The program also fosters a sense of community among the students.

Moreau Seminary, located on the Notre Dame campus, under the direction of the Congregation of Holy Cross, serves as the religious formation house for the congregation’s seminarians pursuing their theological studies at Notre Dame. The Congregation of Holy Cross offers a one-year candidate program at Moreau Seminary for college graduates who qualify and who have a strong interest and desire in taking a step toward investigating a vocation to priesthood or brotherhood in Holy Cross.

Prerequisites
— the completion of a bachelor’s degree;
— evidence of a capacity for independent study and scholarship; such evidence is offered by:
— GRE scores of at least 500 in both verbal and analytical test;
— a transcript of study for the bachelor’s and any graduate degree;
— recommendations from three instructors or professor;
— at least 18 credit hours in philosophy or the equivalent, and 12 credit hours in theology or religious studies;
— evidence of a mature personality capable of ministering to others; to this end, one recommendation supporting the candidate’s ability for ministerial leadership is to be submitted;
— at least one year of full-time service work in ministry in the Catholic Church;
— an autobiography written according to a form specified by the M.Div. director;
— a letter of intent specific to the M.Div. program that sets forth, first, the goals of the candidate for the Christian ministry, and second, a view of how the M.Div. program will assist the candidate in attaining his or her goals;
— a personal interview held at the University, with representatives of the M.Div. program.

Tuition Scholarships
Students admitted to the M.Div. program are eligible for full-tuition scholarships, which are renewable for the duration of the three-year program.

Application
In order to receive an application to the Graduate School (due February 1), prospective applicants for the M.Div. program must file a preapplication form directly with the M.Div. program. To receive more information and the preapplication form, please contact:

Director, Master of Divinity Program, Department of Theology
331 O’Shaughnessy Hall
University of Notre Dame
Notre Dame, IN 46556-5639
Telephone: (219) 631-5682, (219) 631-4256

E-mail: mdiv@nd.edu
(www.nd.edu/~mdiv)

Applicants are admitted to the M.Div. program according to the norms and procedures of the University’s Graduate School. Continuance in the program is based on the student’s cumulative grade point average, performance in field education and skills courses, and the annual academic review by the theology faculty, and the Graduate School’s regulations.

Vocation Discernment
For information regarding discernment of a vocation with the Congregation of Holy Cross, please write or call:

Director of Vocations
Moreau Seminary
Notre Dame, IN 46556
Telephone: (219) 631-6385
E-Mail: vocation@nd.edu
(www.nd.edu/~vocation)

Ph.D. Program
Doctoral studies at Notre Dame provide the opportunity for advanced study in theology through specialization in one of five areas.

Christianity and Judaism in Antiquity covers four disciplines: the Hebrew scriptures; Judaism, especially second temple and early rabbinic Judaism; the New Testament and Graeco-Roman world; and other Christian sources to the early medieval period. These are frequently studied in isolation from one another; in CJA they are studied together for their mutually illuminating interrelationships. At the same time, the integrity of each discipline is respected. Judaism is explored in its own right as well as in its relationship to Christianity. Christianity is explored by itself as well as in its dependence upon Judaism and its conscious emerging distinction from Judaism. Both are explored within the larger contexts of the ancient near East and the Greco-Roman world, which are also studied in their own right.

History of Christianity explores the study of the history of Christianity in all its rich complexity. The program focuses on four major periods: ancient, medieval, the Reformation, and modern (the 19th and 20th centuries). The University has particularly strong library holdings and faculty resources in the ancient and medieval periods.
Liturgical Studies advances the study and understanding of the worship life of the Christian church in its various traditions. The program is inspired by the conviction that liturgy, in its several and diverse manifestations, is the key to the church’s identity, ethos, and orientation toward God and the world. It integrates three subdisciplines: liturgical history, liturgical theology, and ritual studies.

Moral Theology/Christian Ethics studies a number of subdisciplines including foundational, medical, and social ethics. The program encourages interaction with philosophical ethics. While the program concentrates on the Roman Catholic tradition, it engages and is open to a variety of traditions.

Systematic Theology engages in the disciplined and critical inquiry into the major tenets of Christian faith, especially as understood within Catholicism. The program addresses a wide range of concerns including the historical development of theology, constructive issues, and comparative theology.

Course of Studies
1. Residency
The period of “residency” normally consists of two years of course work for those who have a master’s degree in theology. In the rare case of a student admitted without master’s-level work, the period of residency is three years.

Major Fields. Within the program areas, students concentrate their course work in a major field. These major fields are defined as follows:

- Christianity and Judaism in Antiquity
  - Hebrew Bible and Judaica
  - New Testament and Early Church

- History of Christianity
  - Early Church
  - Medieval Studies
  - Reformation Studies
  - Modern Studies

- Liturgical Studies
- Moral Theology/Christian Ethics
- Systematic Theology

Course Requirements. Students are required to take 14 courses during residency: eight of these must be in the major field of study; three must be outside the major fields; and three are electives.

Language Requirements. Students are

required to pass examinations in three languages, Greek or Latin, French, and German. The level of competence required is the ability to read standard theological sources pertinent to the area of study with the aid of a dictionary. Students in the history of Christianity program must know the ancient language at an advanced level. Students in liturgical studies are required to know four languages, all at the basic level. Students in Christianity and Judaism in antiquity are required to pass examinations in five languages: one ancient at an advanced level, one ancient at an intermediate level, one ancient at a beginning level, and two modern languages. The language requirement should be fulfilled as soon as possible and must be fulfilled by the end of the second summer of residence.

Advising. When a student enters the program, the faculty member who serves as the coordinator for the area of studies will function as a preliminary adviser. During the second semester in residency, each student, after appropriate consultation, selects an adviser in his or her area of research interest.

Evaluations. At the end of each semester the entire graduate faculty of the department will evaluate the progress of students. These evaluations are designed to facilitate the progress of students through the program and to identify both strengths and weaknesses. Area coordinators write letters to the students reporting the conclusions of the evaluation. These provide more specific commendations and recommendations than course grades. If there is serious doubt about the student’s ability to complete the Ph.D. degree, he or she may be asked to leave the program.

2. Independent Study
After the period of course work, students spend a period of time, normally nine months, of independent study organized around a series of topics. These topics are meant to expand the students’ intellectual breadth and skills and involve matters of inquiry that extend beyond their course work. After consultation with the adviser, the student will propose a series of 10 topics, seven in the major field of study and three outside the major field. At least one of the topics in the major field will deal with the subject on which the student intends to write a dissertation. The program of independent study is approved by a committee and forms the basis for candidacy examinations.

3. Candidacy Examinations
Offered only twice a year, in October and March, the examinations are usually taken in the second semester after the two-year residency. The exams consist of three days of written examinations and a 90-minute oral examination. Successful completion of the written examinations is required for admission to the oral examination.

4. Dissertation Proposal
The dissertation proposal is to be submitted by the beginning of the semester following oral candidacy examinations.

5. Dissertation
The completed dissertation must be submitted within eight years from matriculation into the program. After approval by a committee composed of the dissertation adviser and three other readers, the dissertation is defended orally.

Prerequisites:
- a bachelor’s degree;
- a master’s degree or the equivalent with a concentration in the proposed field of study;
- GRE scores, with an aggregate score of at least 1800;
- facility in some of the languages required for study in the program: Greek, Latin, Hebrew, French, and German.

The graduate programs are open to all qualified students regardless of religious affiliation.

Scholarships
The doctoral program requires a full-time commitment. For this and other reasons, each doctoral student receives full funding. The funding may come from the University or an outside source. Funding is full tuition plus a stipend for five years. The University provides three funding programs: department fellowships, minority fellowships, and presidential fellowships. In addition, students receive some benefits for travel to professional conferences and summer dissertation support.

Applications
Applications to the Ph.D. program must include an application form, a statement of intent, transcripts of degrees and coursework, three letters of recommendation, and
The Director of Graduate Studies
340 O’Shaughnessy Hall
Department of Theology
University of Notre Dame
Telephone: (219) 631-5732, (219) 631-7811
Email: theodgs@nd.edu
(www.nd.edu/~theo)

Course Descriptions
Each course listing includes:
– Course Number
– Title
– (Lecture hours per week–
laboratory or tutorial hours per week–
credits per semester)
– Instructor
– Course Description
– (Semester normally offered)
The courses are offered regularly by the
department in the course of any two-year
period. They are divided into three
categories: (1) master’s and doctoral courses;
(2) courses specifically for M.Div. students;
and (3) advanced or doctoral courses.

Master’s and Doctoral Courses
500. M.A. Colloquium
(3-0-0) Zachman
Required for all M.A. students. (Every
semester)

503. Pentateuch
(3-0-3) Page, Ulrich, VanderKam
Intended primarily for M.A., M.T.S., and
M.Div. students, this course promotes close
and critical reading of biblical texts and
disciplined theological reflection on them.
Participants will be expected to read the
Pentateuch in its entirety and have a sound
idea of its contents and structure. Much of
the basic information needed will be
acquired through reading; class meetings
will concentrate on theological issues arising
out of the biblical and secondary reading.
Topics include the following: doctrine of
creation; holiness and sin; biblical law and
Christian ethics; covenant: grace and
obligation; Exodus, Passover, liberation;
wilderness themes: providence, guidance,
institutions; community models. (Every fall)

504. Prophets
(3-0-3) Page, Ulrich, VanderKam
We expect to cover the historical develop-
ment of prophecy in Israel and early
Judaism inclusive of early Christianity. Our
method of work combines survey by means
of set readings and “close readings” of
selected prophetic texts. Attention will be
given to comparative material in ancient
and other cultures and to the sociological
coordinates of prophetic phenomena,
including ecstasy. Participants will be
invited to reflect on the theological
significance of prophetic mediation and the
place of prophecy in Christian life today.
(Alternate spring)

505. Wisdom
(3-0-3) Page, Ulrich, VanderKam
Wisdom literature without and within
Israel; Hebrew poetry; selected passages
illustrative of the late theological develop-
ments in the Old Testament period.
(Alternate spring)

507A, 507B. Elementary Biblical Hebrew I, II
(3-0-3) (3-0-3) Najman
An introduction to the Hebrew language,
principally biblical Hebrew—grammar,
morphology, vocabulary, and syntax. We
will work through a standard textbook of
biblical Hebrew, incorporating some work
in Mishnaic and modern Hebrew. No
previous knowledge of Hebrew is assumed.
This is a two-semester course in the
language. (Summer, each fall, and spring)

507H. Intermediate Hebrew
(3-0-3) Ulrich
The primary focus of this course is on
reading the text of the Hebrew Bible, at first
prose narratives, then poetic sections and
consonantal (unpointed) texts. There will
be a review of the grammar of Biblical
Hebrew, as well as development of vocabu-
lar and skills in using lexicons and
concordances of the Hebrew Bible. There
will be quizzes, a mid-term, and a final
exam. Elementary Hebrew is required.
Readings: Biblia Hebraica Stuttgartensia; C.L.
Seow, A Grammar of Biblical Hebrew; F.
Brown, S. Driver, and C. Briggs, Hebrew and
English Lexicon

508A. Elementary Greek I
(3-0-3) Staff

509A. Aramaic
(3-0-3) VanderKam
One year of Hebrew or Syriac is a prerequi-
site for this course. In addition to covering
the grammar and syntax, the principal goal
will be to read the biblical texts in Aramaic
(Ezra 4:8-6:18; 7:12-26; Daniel 2:4b-7:28).
As time permits, we will also read selections
from Old Aramaic monumental inscrip-
tions, Imperial or Achemenid Aramaic (e.g.
Elephantine papyri), and Jewish literary
Aramaic from the later period (e.g. Genesi
Apocryphon). (Alternate spring, odd-
numbered years)

509C. Coptic
(3-0-3) Sterling
This is an intensive introduction to the
grammar and syntax of Sahidic Coptic. The
final weeks are devoted to reading selections
of early Christian texts in Sahidic. (Alter-
ate spring, even-numbered years)

511. Synoptic Gospels and Acts
(3-0-3) Aune, D’Angelo, Meier, Neyrey, Sterling
Introduction to the synoptic Gospels and
Acts of the Apostles in light of source, form,
redaction, and literary criticism. The course
covers the content and theologies of these
early Christian gospels. (Spring)

512. Gospel of John
(3-0-3) Aune, D’Angelo, Meier, Neyrey, Sterling
The course will seek to improve exegetical
skills, to grasp the structure of the gospel of
John, and to explore John’s relationship to
the letters and its function and history in
the community and milieu in which it was
written. The course will consider issues of
genre, context, and theology, including the
wisdom traditions from the gospel’s
christology, its understanding of commu-
nity that affirms the autonomy of the
believer, the significance of prophecy in
Christology and community life, the ways
the women and men participated in the
community, the community’s combination
of resentment toward and relatedness to
“the Jews,” and their rejection of the
Roman imperial order. (Alternate fall)

513. Pauline Writings
(3-0-3) Aune, Neyrey, Sterling
An exploration of the historical Paul and his
reception in the early church. The course
has four basic units. First, we will recon-
struct Paul’s life and explore the significance
of specific events for his thought. Second,
we will work through the uncontested
letters highlighting crucial issues. Third, we
will attempt to explore Paul’s thought
systematically. Finally, we will consider the
reception of Paul by the early church in the
first two centuries. We will use his ancient
Receptionsgeschichte to raise the issue of his
contemporary reception. The course also
serves to introduce students to the critical
study of ancient texts at a graduate level. This will entail the introduction and use of numerous contemporary methodologies. (Alternate fall)

514. Prayer, Worship, Priesthood, and Temple (3-0-3) Neyrey
This course will necessarily give special attention to the Letter to the Hebrews because of its concern to define Jesus as priest and victim who enters a new temple to offer the perfect sacrifice. Yet it will take up a social-science model of prayer and use it as the lens for the reading of OT and NT prayer texts; special attention to the various prayers of Jesus, both in the Garden and on the Cross. Moreover, notions of fixed holy space (temple) and sacrifice will be addressed through the lens of the social sciences. Finally, attention will be given to “sacrifice,” especially the sacrifice of praise celebrated in the New Testament.

520. Women and the Origins of Christianity (3-0-3) D’Angelo
The course will examine the origins of Christianity and the documents of the New Testament from a feminist perspective, analyzing New Testament texts and other sources of early Christianity in order to remember the participation of women in the early Christian movement and to describe the theological stance of each work and author in relation to the inclusion of women in the gospel. It will also look at the ways these texts affect the lives of women today, attempting to be alert to issues of class and race as well as of gender.

521. Early Christianity: An Introduction (3-0-3) Cavadini, Daley, Leyerle
History of Christianity from its beginning to the sixth century. Development of institutions, beliefs, and practices.

522. Historical Theology: Medieval (3-0-3) Wawrykow
Development of Christian theology in medieval Western Europe up to the 12th century. Medieval theologians from Boethius to Ockham. Themes include monastic, scholastic, apocalyptic theology; “authorities” (e.g., Aristotle, Augustine, Pseudo-Dionysius); and reading of the Bible. (Alternate fall)

523. Historical Theology: Reformation (3-0-3) Zachman
An examination of the theology of such major Protestant figures as Luther, Zwingli, Calvin, Melanchthon, Simons, and Cranmer in the context of competing Catholic visions of reform. (Alternate spring)

525. Topics in Early Christianity (3-0-3) Cavadini, Daley, Leyerle
526. Topics in Medieval Theology (3-0-3) Wawrykow
528. The Christian-Jewish Encounter: From Disputation to Dialogue (3-0-3) Signer
In the closing days of Vatican II in the document Nostra aetate (Declaration on Non-Christian Religions), the Catholic Church reversed its negative attitude toward Judaism. This remarkable change promoted “dialogue” with Jews and new approaches to teaching about the nature of Judaism. Reactions from the Jewish communities were diverse: from rejection to welcoming. This course will explore a number of painful issues that emerge from the past: What is the relationship between the negative image of Jews in the New Testament, Christian theological writings and anti-Semitism? How have Jews and Judaism been understood in Christian theologies of history? What responsibility does Christian anti-Jewish teaching bear for the success of National Socialism in Germany and the success of its policy of annihilation of Jews during World War II? How have Jewish authors reacted to this negative Christian tradition? However, there will be occasion to investigate theological ideas for the future: How can Jews and Christians develop religious responses to modernity? In what sense can areas of emphasis in either tradition help Jews or Christians understand themselves more completely within their own community? How can Christians and Jews develop a theology of “other” that is not triumphalist, but empathetic? This course will include reading of original texts from Jews and Christians (in translation) from the past; the writings of modern Catholic and Protestant theologians; and Jewish theologians and historians. Students will be expected to keep a journal of personal reflection, write a term paper, and take midterm and final examinations.

530. Fundamentals of Systematic Theology (3-0-3) Doak
This course is an introduction to some fundamental themes and problems that structure the theological enterprise. These include the definition and understanding of faith, the possibility and form of revelation in general and in particular (Scripture), the sources of theology (experience, Scripture, tradition, the magisterium and so on), and method in theology. As an introduction to the study of theology at the graduate level, its goal is to familiarize students with these themes and problems in such a way as to prepare the students to encounter them in more specific form in subsequent courses in systematic theology (Christology, ecclesiology, and so on). Requirements: short analytical papers on readings, an exam, and a final. (Fall)

532. Christology (3-0-3) Krieg
This course examines the Christologies of Karl Rahner, Edward Schillebeeckx, Brian McDermott, and Jon Sobrino. In each case, a primary text is studied in itself and also in relation to a recurring issue in the church’s understanding of Jesus Christ. The course requires four essay tests based on lectures and readings. (Fall)

533. Ecclesiology (3-0-3) McBrien
Examination of the classical problems of ecclesiology, as well as an attempt to formulate a contemporary doctrine of the church. (Spring)

534. The Mystery of God (3-0-3) O’Regan
The understanding of God in tradition and contemporary theology. (Spring)

536. Theologians of Grace (3-0-3) Hilbert
Grace, the foundation for Christian faith and life, is both unavoidable and intangible. The context for grace is freedom; its opposite is sin; its concretization, charism. The course looks briefly at this reality described by some writings of the New Testament, then at the controversial history of grace and free will and at major theologians of grace: Augustine, Aquinas, Luther, and Rahner. The extent of grace and realizations of grace in art are touched upon. (Fall)

541. Contemplation and Action (3-0-3) Ashley
This course will examine the interaction between Christian spirituality and theology. We will do this by considering articulations of the relationship between contemplation and action in certain Reformation spiritualities (particularly that of Ignatius of Loyola), which then had an impact on the develop-
ment of Latin American liberation theologies, with their distinctive emphasis on action (praxis) for justice. We will begin with a careful analysis of the background and content of Ignatian spirituality; then we will consider those Latin American theologians (including Juan Luis Segundo, Jon Sobrino, and Gustavo Gutiérrez) who have been influenced by Ignatian spirituality and have attempted to produce both a theology and a spirituality of liberation. Requirements: midterm, final, and research paper.

544. Myth and Story
(3-0-3) Dunne
An interpretation of myth starting from the question “What kind of story are we in?” and “What kind of story am I in?” and dealing with (a) the life story, (b) the spiritual adventure, and (c) the journey with God in time. (Spring)

545. Selected Themes in Comparative Theology
(3-0-3) Malkovsky
The metaphysical system of the Hindu monk Shankara (ca. 700 C.E.), which is known as Advaita Vedanta, offers a non-dualistic interpretation of reality based on the revealed Upanishads. This system is important today, not only because Shankara represents the pinnacle of Hindu philosophical theology, but also because his thought is the most widely accepted among Hindu theologians today, and further, because Advaita presents a challenging alternative to the theism of the Semitic religions. Our course will pursue a twofold goal. First, we will examine some of Shankara’s writings in translation to determine the essence of his teaching, but also to uncover the reasons why quite variant interpretations of his thought have been given, especially in recent decades, both by Hindus and by adherents to other faiths. Second, we will compare Shankara’s thought with Christian theology on foundational issues, giving special attention to the teaching of Aquinas. We shall examine such themes as theological method, doctrine of the Absolute, ontology, anthropology, and soteriology. We will ask three questions throughout the course: Just what is, finally, non-duality? What significance might the teaching of non-duality have for Christian faith and reflection? How does a specifically Christian interpretation of Shankara’s Advaita compare with the assessments of others? (Alternate fall)

548. Religion and Science
(3-0-3) Ashley
Science and religion are complex phenomena that can be analyzed in terms (at least) of their epistemological, existential, and social dimensions. Both science and religion generate justified beliefs. The criteria and spheres of justification for these beliefs overlap and interrelate in extremely complicated ways that have led both to conflict and to mutual enrichment. This is an upper-division undergraduate- or introductory graduate-level review of these complicated interrelations. There will be two major divisions to the course. In the first we will take up methodological issues, considering different approaches to correlating science and religion. In the second part of the course we will deal in depth with the correlations between scientific cosmologies and Christian doctrines of creation and of God’s providential governance of creation. Requirements: participation in small reading groups outside of class, midterm, final exam, and research paper.

550. Foundations of Moral Theology
(3-0-3) Ryan
A theoretical and practical introduction to the theory of morality, with a special emphasis on Catholic moral theology. Topics will include the foundations of morality; the conditions of voluntariness; and moral norms and possible exceptions to them. Course requirements will include a midterm and a final examination. (Spring)

551. Social Ethics
(3-0-3) Whitmore
Analysis of basic issues and alternatives in Christian social ethics. The nature of the church as moral decision-maker, relation between church and society, place of social science for social ethics.

553. Virtue and Sin in the Christian Tradition
(3-0-3) Porter
There has been considerable interest recently in recovering traditions of reflection on the virtues as a resource for Christian ethics. In this course, we will explore this tradition through an examination of three of its key figures, namely, Augustine, Aquinas, and Jonathan Edwards. Through a close reading of primary texts (in English) and contemporary writings on these texts, we will reflect on what these authors understood by virtue, how their theories of virtue both interpret a past tradition and influence their successors, and how those theories might be relevant to Christian ethics today. Course requirements will include several short papers and a longer paper on a topic to be determined in consultation with the instructor.

554. Christian Ethics and Pastoral Practice
(3-0-3) Poorman
The relationship between Christian ethics and the contemporary ministry in the church. Following a general review of themes in Christian ethics, including conscience, sin, Scripture and the moral life, natural law and the authority of church teaching, we will consider ethical issues that have pastoral dimensions. We will focus on effective pastoral translation of church teaching and moral theology in the areas of bioethics, sexuality, and social justice. We will also study the professional ethics of pastoral leadership. (Fall)

556. Liturgical History
(3-0-3) Staff
A rapid survey of the whole history of liturgical development in the West from New Testament times to the present. The reading is from major classics of liturgical studies. Required for incoming M.A. students in liturgy. (Fall)

557. Christian Initiation
(3-0-3) Johnson
An investigation of the historical development of the rites of Christian initiation and their theological interpretations in the East and West from the New Testament to the modern period of ecumenical convergence. In light of this investigation some modern forms of these rites (e.g., the Rite of Christian Initiation of Adults) are critically considered.

559. Eucharist
(3-0-3) Driscoll
The church makes the Eucharist and the Eucharist makes the church. A biblical, historical, systematic, and liturgical treatment of the Eucharist, emphasizing pastoral considerations. (Spring)

560. Liturgical Theology
(3-0-3) Staff
This course introduces the student to the larger theological, historical, and interdisciplinary issues in any liturgical celebration, following the axiom, lex orandi lex credendi. (Variable spring)

563. Pastoral Rites
(3-0-3) Staff
The historical, theological, and pastoral dimensions of the occasional offices that
minister to life’s journeys and passages: reconciliation, ministry to the sick, Christian marriage, ordination, and Christian burial. An ecumenical approach will be taken but with emphasis on the reformed rites of the Roman Catholic Church. (Spring)

571. The Vulgate and Related Texts
(3-0-3) Bower
Readings in the Latin of the Vulgate, texts by Jerome associated with his translation and readings from Augustine (de doctrina christiana) concerning how scriptures should be read. Latin readings will be at an intermediate level, and some review of grammar will be offered.

572. Ritual Studies
(3-0-3) Melloh
The pastoral liturgist is one who fosters critical praxis in the liturgical life of a local church. This course is designed to introduce students to ritual studies through a treatment of ritual, symbol, language, myth and story, time and space, music, and art. Students will discuss and employ a method for analysis of worship events.

577B. Health Care Chaplaincy
(1-0-.5) Bowman
An introduction to ministry in a hospital setting. (Spring)

577C. Adult Education
(1-0-.5) Connors
A basic introduction to the fundamentals of adult education, especially in a parish setting. (Spring)

577D. Liturgical Music
(1-0-.5) Connors
A basic introduction to the fundamentals of liturgical music, especially in a parish setting. (Spring)

577E. Ministry to the Poor
(1-0-.5) Ercoline
The poor knock at the doors of the Church. Now more than ever, impoverished people turn to church and religious nonprofit institutions for help in obtaining basic needs. Almost every Catholic school, parish, hospital, and college has outreach programs for the poor. This course will address practical issues of direct service to the poor with topics such as: hospitality, screening, referral and advocacy, volunteer management, public relations, fund-raising, project management, and integrating direct service projects with classroom learning, evangelization, catechesis, faith reflection and prayer. All topics will be presented with the underlying conviction that what we do for the least of our sisters and brothers we do for Christ. It is Jesus who knocks at the door. (Spring)

577A. Hispanic Ministry Workshop
(1-0-.5) Zapata
An introduction to the practical fundamentals of Christian ministry among Hispanic populations. (Fall)

578B. Youth Ministry Workshop
(1-0-.5) Staff
The development and implementation of youth ministry programs. (Fall)

578C. Marriage Preparation
(V-V-V) Dillon
This course addresses practical approaches to the ministry of preparing couples for the sacrament of marriage. (Spring)

578D. Social Justice Workshop
(V-V-V) Clark
This workshop addresses the theory and practice of the Church’s social justice ministries, especially in the parish. (Fall)

579B. Grief and Loss Counseling Workshop
(1-0-.5) Connors
This workshop will address issues concerning terminal illness, death, and loss. (Spring)

579C. Campus Ministry Workshop
(1-0-.5) Staff
Introduction and analysis of the challenges of ministry in a higher-education setting. (Spring)

579D. Spiritual Direction
(1-0-.5) Staff
This workshop will provide an introduction to the general principles of spiritual direction. The content will be designed to address the needs of those in ministry situations who may be working with others as a spiritual director. The format used will include presentations, demonstrations, group and individual exercise, and sharing.

581. Visions and Goals of Ministry
(1-0-1) Staff
Directed fieldwork and seminars with emphasis on the methods of field education will be developed. Focus on diagnosing skills, clarifying goals, concretizing objectives, identifying methods of learning, and understanding theology implied.

582. Service: Secular or Christian
(2-0-2) Staff
Directed fieldwork and seminars with emphasis on the methods of reporting and understanding the experience. (Spring)

583. Models of Ministry
(2-0-2) Connors
In conjunction with supervised ministerial placement, students examine operative ecclesioologies, pastoral strategies, and practical theologies of ministry.

584. Images of Christian Ministry
(2-0-2) Connors
Through selected reading, supervised fieldwork and theological reflection in a seminar, students examine contemporary images of Christian ministry. Reading materials will continue to come from the first semester bibliography. (Spring)

585. Authority and Leadership in Ministry
(2-0-2) Staff
Through supervised field experience and seminars, students treat issues inherent in their exercise of authority. In particular they analyze the theology displayed by their actions. Students are required to write a

# 400-Level Courses Open to Graduate Students
For a complete listing of 400-level course descriptions please refer to the theology section in the Bulletin of Information, Undergraduate Programs.

Courses Specifically for M.Div. Students
500B, 500C. Faith and Traditions I, II
(3-0-3) (3-0-3) Miscamble
Required of all C.S.C. candidates.

576. Foundations of Pastoral Care
(1-0-1) Vachon
Self-assessment of skills for ministry. For first-year students. (Fall)
588. Pastoral Administration
(1-0-5) Vachon
A basic introduction to the administrative dimensions of pastoral ministry, including staff development, planning, programming, and finances. A required skills course for second-year M.Div. students. (Fall)

591. Canon Law
(3-0-3) Lahey, Staff
Provides students studying for ministry with an introduction to the law of the Roman Catholic Church. General principles for the interpretation of canon law as well as its history, and its relationship to theology and pastoral praxis are discussed. Although attention is given to the laws and canonical jurisprudence concerning marriage, other selected canonical topics of value to those in ministry are considered as well. (Fall)

592A. Liturgical Celebration and Ministry I
(1-0-1) Melloh
A study of the structure of the eucharistic rite and the Liturgy of the Hours with emphasis on ministerial roles. (Fall)

592B. Liturgical Celebration and Ministry II
(1-0-1) Melloh
Theory and practice of presiding at baptism, marriage, anointing the sick, and funerals. (Spring)

593A. Preaching I
(1-0-2) Melloh
An introduction to homiletics. (Fall)

593B. Preaching II
(1-0-2) Melloh
A continuation of Preaching I, this course treats exegesis for preaching, methods of homily preparation and delivery. (Fall)

593C. Preaching III
(2-0-3) Melloh
Practice and supervision of preaching. (Spring)

594. Reconciliation Ministry
(1-0-1) Weiss
Guided practice in encountering and responding to select personal problems through the sacrament of reconciliation. (Fall)

596. Synthesis Seminar
(2-0-2) Connors, Staff
In this seminar, students will articulate the theology that has emerged in their supervised fieldwork during their semesters in the M.Div. program. (Spring)

603. Hebrew Bible Seminar
(3-0-3) Page, Ulrich, VanderKam
Investigation of historical, literary, and theological aspects of the Hebrew Bible. (Offered with varying topic each fall)

604. Hebrew Bible Seminar
(3-0-3) Page, Ulrich, VanderKam
Investigation of historical, literary, and theological aspects of the Hebrew Bible. (Offered with varying topic each spring)

605. Judaica Seminar: Biblical Interpretation of the Rabbis
(3-0-3) Najman, Signer
Study of selected texts and problems in ancient Judaism. (Offered with varying topic)

610A. Advanced Greek
(3-0-3) Aune, D’Angelo, Sterling
For Ph.D. candidates who require Greek as a major research language. Others should consult instructor before registering. (Fall)

610B. Advanced Hebrew
(3-0-3) Najman, Page, Ulrich, VanderKam
For Ph.D. candidates who require Hebrew as a major research language. Others should consult instructor before registering. (Fall)

611. New Testament Seminar
(3-0-3) Aune, D’Angelo, Meier, Neyrey, Sterling
Investigation of historical, literary, and theological aspects of the New Testament. (Offered with varying topic each semester)

612. New Testament Seminar
(3-0-3) Aune, D’Angelo, Meier, Neyrey, Sterling
Investigation of historical, literary, and theological aspects of the New Testament. (Offered with varying topic each semester)

621. Early Christianity Seminar
(3-0-3) Cavadini, Daley, Leyerle
Studies of selected patristic texts and early Christian history. (Offered with varying topic each fall)

622. Early Christianity Seminar
(3-0-3) Cavadini, Daley, Leyerle
Studies of selected patristic texts and early Christian history. (Offered with varying topic each spring)

634. Historical Seminar: Medieval
(3-0-3) Signer, Wawrykow
Seminar on a selected theological topic in the medieval period.

634A. Medieval Exegesis
(3-0-3) Signer
Various topics in the history of exegesis in the medieval world. Topic for fall 2001: Our focus during the semester will be on the relationship between biblical interpretation and the polemical literature written by Jewish and Christian authors from 1050-1200. Students will read the recent accounts of this literature by Gavin Langmuir, Anna Sapir Abulafia, Gilbert Dahan, and Jeremy Cohen. Excerpts from medieval Christian authors such as Abelard, Gilbert Crispin, Guibert of Nogent, Bernard of Clairvaux, Peter the Venerable, Petrus Alfonsi, and Alan of Lille. Passages from Jewish authors such as Rashi, Rabbi Joseph Kara, Rabbi Samuel ben Meier, and Rabbi Joseph of Orleans will also be studied. Students will be expected to make an oral presentation and write a paper that provides an explication of the arguments in a polemical work.

635. Historical Theology: Reformation
(3-0-3) Zachman
Seminar on a selected theological topic in the Reformation and Renaissance periods.

637. Modern Theology and the Emergence of the Secular
(3-0-3) Herdt

641. Systematic Theology Seminar: Postmodern Theology
(3-0-3) O’Regan
Topic for fall 2001: This seminar explores a variety of contemporary ‘theologies’ that understand themselves to be postmodern in the sense (1) that the grounds of much of modern theological reflection, whether reason, experience, society, or culture, have proved baseless, and the modern enterprise of securing belief is illusory; (2) that a theological alternative that is not simply post in a chronological sense, but which is radically other and deeper is a necessity. The seminar will deal with three types of postmodern theology with different commitments to the premodern theological, and with different understandings of the use-value of philosophy and other non-theological discourses. The first type is the deconstructionist type. For purposes of the
seminar this type will be exhibited by the work of Jacques Derrida (especially the later work) and John Caputo. The second type is that of radical orthodoxy. John Milbank and Catherine Pickstock represent this particular postmodern dispensation. The third type is represented by the work of Jean-Luc Marion, who brings together classical negative theology with post-Heideggerian phenomenology. The second and third types of postmodern theology are characterized by greater respect for the theological tradition than that evidenced by the representatives of the first type, and by their view of the possibility for positive conversation between premodern theology and postmodern philosophy. In this they oppose the first type, which in principle at least points to a postmodern form of religiosity that is qualitatively different not only from modern but premodern forms. Aims for the course include the gaining of literacy in the complex and sometimes dense discourse of postmodern theology, critically assessing the critique of modernity and modern theology, and evaluating the moves of retrieval that are made within the auspices of at least two of the varieties of postmodern theology.

642. Systematic Seminar: God
(3-0-3) O'Regan
Seminar on selected sources and theologies about God.

643. Systematic Seminar: Christ
(3-0-3) Krieg
Seminar on selected topics concerning Jesus.

644. Systematic Seminar: Grace
(3-0-3) Hilkerf
Seminar on selected topics and theologians concerning sin, grace, and salvation.

645. Systematic Seminar: The Church
(3-0-3) McBrien
Seminar on selected topics concerning church, ministry, sacraments. In the fall of 2001 the course will examine the principal ecclesiological themes articulated in the documents of the Second Vatican Council, e.g., sacramentality, community, authority, collegiality, servanthood, and ecumenicity. The conciliar ecclesiology will be situated in its wider historical and theological contexts, taking particular note of the pre-conciliar ecclesiologies of the various Christian traditions and of developments generated by the council.

646. Systematic Seminar: Topics in Systematic

647. Systematic Seminar: Theological Anthropology
(3-0-3) Hilkerf
This seminar treats the Christian understanding of human life in relation to the triune God. It delves into the themes of creation, sin, grace, and the coming of God's new creation.

651. Ethics Seminar: Methods
(3-0-3) Baxter, Porter, Ryan, Whitmore
A selection of American, European, and Latin American authors, with emphasis on ecumenical interaction and consensus-formation within the discipline. (Topic changes each fall.)

652. Ethics Seminar: History
(3-0-3) Baxter, Porter, Ryan, Whitmore
Topic for spring, 2002 (Porter): Aquinas and His Interlocutors. In recent years, there has been a resurgence of interest in Aquinas' ethical thought, but so far retrievals of his ethics have neglected context out of which it emerged. Yet Aquinas' moral thought that cannot be fully understood or appreciated unless it is placed in the context of his interlocutors. Furthermore, the study of his moral thought in this context enables us to see how moral concepts develop over time, and how they are shaped by social and cultural, as well as intellectual factors.

In this course, we will accordingly examine Aquinas' writings on natural law in the context of relevant texts from selected 12th- and 13th-century authors, including Abelard, Gratian, William of Auxerre, Bonaventure, and Albert the Great. All texts will be made available in translation, although students who wish to read them in Latin will be given the opportunity to do so. Course requirements will include several short papers and a longer paper on a topic to be determined in consultation with the instructor.

653, 654, 655, 656. Ethics Seminar: Themes
(3-0-3) Baxter, Porter, Ryan, Whitmore
Study of salient aspects of ethics in light of Christian faith: conscience, freedom, law, grace, sacrifice, individual and community, character, etc.

658. History of Theology/Ethics/Social Order
(3-0-3)
The aim of this course is to do close readings in the history of theological social theory and to ask how the theological, ethical, and social claims are related by the writer(s) in question. Tentative schedule of texts: Christian scripture (Luke-Acst), early church fathers (Augustine et al.), Benedict's Rule, Aquinas (parts of Summa and On Kingdom), Vitoria, Luther (On Whether Soldiers Too Can Be Saved, etc.), Calvin (selections from Institutes and Commentaries), Anabaptists (Schleitheim Confession), and Locke (Second Treatise on Government).

659. Seminar in Theological Ethics
(3-0-3) Baxter
A study of the emergence and development of the Americanist tradition in Catholic social theory from World War I to the present. The leading emphases will be the institutional settings and theoretical paradigms that have shaped the discourse of what is now called “Catholic Social Ethics.” Texts will be read genealogically in an effort to discover how the central terms and categories in Catholic social theory have shifted over time. And the readings will be interdisciplinary in nature, so as to explore how Catholic social theory has been shaped by theology, philosophy, political theory, economic theory, legal theory, and history. Authors to be studied include John A. Ryan, Moorhouse F.X. Millar, Jacques Maritain, Yves Simon, John Courtney Murray, John Tracy Ellis, Bryan Hehir, David Hollenbach, John Coleman, Dennis McCann, Michael and Kenneth Himes, George Weigel, Michael Novak, and Richard John Neuhaus. By virtue of the material, special attention will be paid to the writings of John Courtney Murray and the strengths and weaknesses of the so-called “Murray Project.” Themes to be examined include nature and grace, faith and reason, church-state relations, the nature of law, the character of the modern state, the problem of religious pluralism and freedom, and the possibility of finding resources for an alternative or counter-tradition to the Americanist tradition.

660. Mercy and Justice
(3-0-3) Kaveny
This course will explore the meaning of mercy, particularly in its relationship to justice. It will have four major topics: (1) Mercy in its relation to retributive justice. Here we will look at the role of mercy (i.e., clemency) in the case of criminal sentencing, as well as broader questions of retribution and wrongdoing. Issues arising here include whether there can or should be criteria for the exercise of mercy, whether
one can exercise mercy unjustly, and the relationship of forgiveness to mercy. (2) Mercy in its relation to distributive justice. The focus here will be the corporal works of mercy; issues include the relationship between justice and “private charity” (i.e., whether in a truly just distributive scheme there would be no place for some or all of the works of mercy). (3) Mercy in its relationship to social justice. The main focus here will be on the role of solidarity; is it an aspect of social justice or is it the social face of mercy? (4) Divine mercy. Here the focus will be the various ways theologians have attempted to reconcile divine mercy and divine justice. Readings for the class will be interdisciplinary; they will include materials from legal, philosophical, and theological sources.

661. Philosophical Theology
(3-0-3) Burrell

662. Theological Method
(3-0-3) Ashley
A study of the forms of theological investigation, including dialectical theology, transcendental Thomism, correlationist methods, and feminist theologies. In the fall of 2001 this seminar will explore central methodological issues underlying the diversity and pluralism within contemporary theology. It will be divided into three major units. The first and second parts of the seminar will focus on two fundamental issues that have organized the “turn” to method in modern theology: the interpretation of classic texts and events from the past (hermeneutics), and the insistence on praxis as a broader category contextualizing theoretical reflection (liberation theologies). For each of these we will (1) read philosophical sources (e.g., work in philosophical hermeneutics or critical theory), (2) analyze in detail the particular way that these sources are deployed by one or two representative theologians in order to craft a theological discourse that is responsive to a particular challenge to theology posed by late modernity, and (3) investigate how these methodological decisions shape the approach to a particular topic in systematic theology (for fall of 2001, Christology). In the final weeks of the seminar we will evaluate critiques of the “turn to method” in each of the prior two categories. The primary figures to be considered are Hans Georg Gadamer, Paul Ricouer, David Tracy, Jon Sobrino, Gustavo Gutiérrez, and Ignacio Ellacuría. Course requirements: close reading of assigned texts, active seminar participation, and a final research paper that considers a different theologian of the student’s choice.

666. Systematic Seminar: Eschatology
(3-0-3) Doak
Eschatology, often defined as the study in Christian theology of “the last things,” can also be understood as the study of Christian hope. To what extent is Christian redemption experienced as a promise rather than a realization? What is this as yet not fully realized hope? The revival of interest in eschatology in the 20th century has focused on Christian hopes for history. This course examines current eschatological debates through a focus on contemporary eschatological theologies and their hopes for history, considered critically and in relation to the history of Christian eschatological thought.

667. Comparative Theology Seminar
(3-0-3) Burrell, Malkovsky
Seminar on selected texts and topics in non-Christian religions. Topic changes each alternate spring. The purpose of this seminar is to introduce students of systematic theology to recent developments in the theological dialogue between Christianity and other religions, and to deepen their theological understanding of God, christology, grace, eschatology, and religious experience through the encounter with three specific faiths: Hinduism, Buddhism and Islam. This course presupposes no previous knowledge of other religions; it is designed to provide the student with a solid theological foundation for further scholarly research or for incorporation in the classroom.

671. Early Liturgies
(3-0-3) Bradshaw, Johnson
An introduction to the liturgical sources, ancillary documents, and methodologies for the study of Christian liturgy in the churches of the first four centuries of the Christian era. The course concentrates on the Eucharist and its anaphora, the rites of Christian initiation, the origins and early evolution of the Liturgical Year, and the Liturgy of the Hours.

672. Eastern Liturgies
(3-0-3) Staff

673. Medieval Liturgies
(3-0-3) Driscoll
The development of the liturgy of the Latin rites through the 15th century. The purpose of this seminar is to examine the various sacramental rites in the Middle Ages, especially the eucharistic liturgy, and to attempt to reconstruct them within the context of liturgical enactment, architectural space, artistic and musical decoration, etc. The seminar must necessarily deal with liturgical texts, but this is only a first step for understanding the broader dimensions of the liturgy. Architectural, artistic, and musical components will be taken into consideration. Numerous commentaries on the liturgy are also an important source for garnering the medieval understanding of the liturgy, especially in its allegorical interpretation. A tangential but key element for the understanding is the devotional and spiritual practices that grew up alongside the official liturgy. Therefore, some attention will be given to these dimensions, including liturgical drama and mysticism.

679. Reformation Liturgy Seminar
(3-0-3) Staff

680. Modern Liturgies Seminar
(3-0-3) Mitchell
Selected topics in Roman Catholic worship from Trent to today. Representative topics will be examined in such areas as popular devotions, liturgical music, visual arts, the Enlightenment, the liturgical pioneers, the recent revision of rites, and shifts in the theological foundations of worship. In the fall of 2001 the purpose of this course is to introduce students to the movements, documents, issues, and personalities that gradually coalesced to form what is commonly called “(in Europe and North America) “the Modern Liturgical Movement.” The period covered stretches from ca. 1650 to 2000 C.E., and deals with historical developments in both post-Reformation Europe and North America—and among both Roman Catholic and Protestant churches.

During the course of the semester, each student will be asked to write six short papers (each roughly eight to 10 pages in length, including footnotes/endnotes and bibliography) on topics drawn from the syllabus. Two papers will focus on the historical periods themselves, as outlined in the syllabus; two papers will focus on issues and documents that contributed to liturgical reform or renewal; and two papers will focus on personalities who worked during one of the historical periods studied. There is no mid-semester or final exam in this course. Students will be evaluated on the basis of their papers and their participation in the seminar meetings.

681, 684. Liturgical Theology
682. Ritual Studies
(3-0-3) Melloh
Analysis of the levels of meaning to be found in an observed rite in light of selected ritual theorists.

683. Sacramental Theology
(3-0-3) Staff

685. Liturgical Theology
(3-0-3) Amar
Topics vary from year to year. In the fall of 2001 the seminar will investigate topics related to Syriac, Armenian, and Egyptian liturgical traditions. Emphasis will be given to the history, ritual, and, when possible, theology of each of four topics:

1. The Liturgical Year
2. Feasts of the Mother of God
3. Liturgy of the Hours
4. Penitential Rites

No knowledge of the specific liturgical languages is expected. However, readings drawn from French and German sources will be included in the bibliography.

Participants will make in-class presentations followed by discussion. Rather than a single major paper based on the work of the entire semester, a shorter paper will be required following the treatment of each topic.

689. Dissertation Research Seminar
(3-0-3) Staff
For students in final semester of course work to begin collegially the basic research for their dissertation topics. Required for liturgy students; elective for others. (Spring)

Other Graduate Courses
697. Directed Readings
(0-0-V)

699. Research and Dissertation
(V-V-V) Staff

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

Faculty
J. M. ATTHEW ASHLEY, Associate Professor. B.S., St. Louis Univ., 1982; M.T.S., Weston School of Theology, 1988; Ph.D., Univ. of Chicago Divinity School, 1993. (1993)


MARY DOAK, Assistant Professor. B.A., Loyola Univ. of Chicago, 1987; M.A., Univ. of Chicago, 1988; Ph.D., ibid., 1999. (1999)


JOSEPHINE MASYNGBAERDE FORD, Professor Emerita. B.A., Univ. of Nottingham, 1957; B.Div., King’s College, Univ. of London, 1963; Ph.D., Nottingham Univ., 1965. (1965)


M. CATHERINE HILKERT, Associate Professor. B.A., Univ. of Dayton, 1971; M.A., Catholic Univ. of America, 1979; Ph.D., ibid., 1984. (1996)
MAXWELL JOHNSON, Associate Professor.
B.A., Augustana College, 1974; M.Div.,
Warburg Seminary, 1978; M.A., St. John’s
Univ., 1982; M.A., Univ. of Notre Dame,
ROBERT A. KRIEG, Professor (on leave
Ph.D., Univ. of Notre Dame, 1976. (1977)
REV. JOHN LAHEY, C.S.C., Assistant
Professional Specialist. A.B., Univ. of Notre
dame, 1966; M.A., Univ. of Notre Dame,
Specialist.
HOMILETICS AND LITURGICS AND PROFESSIONAL
COORDINATOR OF THE JOHN S. MARTEN PROGRAM IN
REV. JOHN ALLYN MELLOH, S.M.,
Univ., 1982; M.A., Univ. of Notre Dame,
(2001-2002)
REV. JOHN LAHEY, C.S.C.,
Ph.D., Univ. of Notre Dame, 1976. (1977)
BLAKE LEYERLE, Associate Professor.
B.A., St. John’s Univ., 1975; M.A.,
Univ. of Tübingen, 1983; Ph.D., ibid., 1992.
(1992)
REV. EDWARD A. MALLOY, C.S.C.,
President of the University and Professor of
Theology. B.A., Univ. of Notre Dame, 1963;
M.A., ibid., 1967; M.Th., ibid., 1969; Ph.D.,
TIMOTHY MATOVINA, Associate Professor
(on leave 2001-2002). B.A., Indiana Univ.,
1978; M.Div., Toronto School of Theology,
St. Michael’s College, 1983; Ph.D., Catholic
REV. RICHARD P. McBRIEN, Crowley-
O’Brien-Walter Professor of Theology. A.B., St.
Thomas Seminary, Conn., 1958; M.A., St.
John Seminary, Mass., 1962; S.T.L.,
(1980)
GERALD MCKENNY, Associate Professor.
B.A., Wheaton College, 1979; M.Div.,
Princeton Theological Seminary, 1982; Ph.D.,
JOHN MEIER, Professor (on leave spring
2002). B.A., St. Joseph’s Seminary, 1964;
S.T.L., Gregorian Univ., 1968; S.S.D.,
REV. JOHN ALLYN MELLOH, S.M.,
Coordinator of the John S. Marten Program in
Homiletics and Liturgics and Professional
Specialist. B.A., Univ. of Dayton, 1965; B.S.,
Ed., ibid., 1966; M.A., Univ. of Notre Dame,
1972; Ph.D., St. Louis Univ., 1974. (1978)
REV. LEON MERTENSOTTO, C.S.C.,
Associate Professor. B.A., Univ. of Notre Dame,
1953; S.T.L., Gregorian Univ., 1957; S.T.D.,
Univ. of Fribourg, 1961. (1961)
HINDY NAJMAN, Assistant Professor (on
leave spring 2002). B.A., Stern College,
Yeshiva Univ., 1989; Ph.D., Harvard Univ.,
REV. JEROME NEYREY, S.J., Professor (on
leave 2001-2002). B.A., St. Louis Univ.,
1963; M.A., ibid., 1964; M.Div., Regis
College, 1972; M.Th., ibid., 1972; M.A., Yale
Univ., 1975; Ph.D., ibid., 1977; S.T.L.,
Weston School of Theology. 1987. (1992)
REV. THOMAS F. O’MEARA, O.P.,
William K. Warren Professor of Theology. Bacc.
Phil., St. Thomas College, 1958; Lic.Phil.,
ibid., 1959; M.A., Aquinas Inst., 1963;
M.Div.Theol., ibid., 1963; Ph.D. Theology,
CYRIL O’REGAN, Associate Professor. B.A.,
Univ. College Dublin, Ireland, 1974; M.A.,
ibid., 1978; M.A., Yale Univ., 1983; M.Phil.,
REV. HUGH ROWLAND PAGE JR.,
Associate Professor. B.A., Hampton Inst., 1977;
M.Div., Pittsburgh Theological Seminary,
1980; S.T.M., General Theological Seminary,
1983; A.M., Harvard Univ., 1988; Ph.D.,
ibid., 1990. (1992)
REV. MARK POORMAN, C.S.C., Vice
President for Student Affairs and Associate
Professor. B.A., Univ. of Illinois, 1976;
M.Div., Univ. of Notre Dame, 1980; Ph.D.,
Graduate Theological Union, Berkeley, 1990.
(1990)
JEAN PORTER, Director of Graduate Studies
and John A. O’Brien Professor. B.A., Univ. of
Texas at Austin, 1976; M.Div., Weston
School of Theology, 1980; M.A., Yale Univ.,
THOMAS PRUEGL, Assistant Professor.
Lic.Theo., 1988, University of Munich,
Germany; Th.D., 1994, ibid (2001)
MAURA A. RYAN, Associate Professor. B.A.,
St. Bonaventure Univ., 1979; M.A., Boston
College, 1987; M.Phil., Yale Univ., 1990;
RABBI MICHAEL A. SIGNER, Abrams
Professor of Jewish Studies. B.A., Univ. of
California, Los Angeles, 1966; M.A., Hebrew
Union College-JIR, 1970; Ph.D., Univ. of
GREGORY E. STERLING, Professor. A.A.,
Florida College, 1974; B.A., Houston Baptist
Univ., 1978; M.A., Pepperdine Univ., 1980;
M.A., Univ. of California, Davis, 1982;
Ph.D., Graduate Theological Union, Berkeley,
EUGENE C. ULRICH, Rev. John. A. O'Brien
Professor (on leave spring 2002). Litt.B., Xavier
Univ., 1961; Ph.L., Loyola Univ., 1964;
M.Div., Woodstock College, 1970; M.A.,
(1973)
JAMES C. VANDERKAM, John A. O’Brien
Professor (on leave fall 2001). A.B., Calvin
College, 1968; B.D., Calvin Theological
(1991)
JOSEPH P. WAWRYKOW, Associate
Professor. B.A., Univ. of Manitoba, 1978;
M.Phil., ibid., 1984; Ph.D., ibid., 1987.
(1986)
REV. JAMES F. WHITE, Professor Emeritus.
A.B., Harvard Univ., 1953; B.D., Union
Theological Seminary, 1956; Ph.D., Duke
TODD D. WHITMORE, Associate Professor.
B.A., Wabash College, 1979; M.Div., Harvard
Divinity School, 1985; Ph.D., Univ. of
RANDALL C. ZACHMAN, Director of M.A/
M.T.S. Program and Associate Professor. B.A.,
Colgate Univ., 1975; M.Div., Yale Divinity
School, 1980; Ph.D., Univ. of Chicago, 1990.
(1991)
The Division of Science

In the Division of Science, programs in graduate study leading to the degree of doctor of philosophy are offered in the fields of biological sciences, biochemistry, chemistry, mathematics, and physics. Programs leading to the degree of master of science are also available in these departments.

In its programs of research and instruction, the Division of Science proposes: (1) to educate ethically grounded scientists of disciplined intelligence who can participate fruitfully in the affairs of human society; (2) to conduct research dedicated to the discovery and integration of truth and to train additional scientists with comparable skills and ideals; and (3) to interpret the principles and discoveries of science, with their implications and significance, by lectures, research, articles, and books.

Graduate students in the Division of Science are encouraged to cross departmental lines of instruction and to participate in interdisciplinary programs to broaden their outlook and promote the integration of the sciences in areas of overlap.

Biological Sciences

Chair:
John G. Duman

Assistant Chairs:
Paul R. Grimstad
Ronald A. Hellenthal
Rev. James J. McGrath, C.S.C.

Director of Graduate Studies:
Frederick W. Goetz Jr.

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The Program of Studies

The graduate program in biological sciences is designed to provide students with depth of knowledge and insight into their particular areas of interest and a broad background in the whole area of biology. Special efforts are made to place the students’ areas of interest into proper perspective with the other areas of biology and with cognate sciences. The goal is to train the students to be professional biologists in every good sense of the word “professional.”

To achieve this goal, all students are encouraged to take appropriate courses in other departments as well as in biological sciences. Formally structured interdisciplinary programs are available in biochemistry and biophysics (see program description in this Bulletin), with the Department of Civil Engineering and Geological Sciences.

The Department of Biological Sciences is housed in the Galvin Life Sciences Center. The facilities are excellent for most types of laboratory research in biology. They include controlled environment rooms, photographic facilities and an optical facility (scanning and high-resolution transmission electron microscopes, plus confocal imaging system), radioisotope rooms with specialized equipment, ultracentrifuges, centralized automated sequencing and imaging systems, sterile transfer rooms, computing equipment, facilities for behavioral and electrophysiological research, and the World Health Organization’s Aedes Reference Center. The recently completed Hank Center for Environmental Science adds more than 20,000 square feet of state-of-the-art research space for aquatic and environmental biology that includes greenhouses, wet laboratories, a field sample processing room, and a fully equipped shop.

In addition, the Freimann Life Science Center provides a modern animal care facility for research and teaching. Two lakes on campus, several nearby natural areas, and the University’s 7,500-acre environmental research center in northern Wisconsin and the upper peninsula of Michigan offer a wide variety of habitats for ecological, limnological, and entomological field studies.

A specialized teaching and research library is housed in the Life Sciences Center as a branch of the campus library. The department maintains and operates a PC-based Local Area Network (LAN) and a Macintosh LAN. The LANs are connected to University-wide networks. The department’s Greene-Nieuwland Herbarium contains about 250,000 specimens.

The Radiation Laboratory, a University institute for high-energy radiation studies, and the Center for Environmental Science and Technology also provide facilities for biological research. In addition, the University maintains a Bioscience Core Facility to provide basic biochemical support for cellular and molecular biology. The University publishes the journal, The American Midland Naturalist.

Because there are many opportunities for fruitful research in areas that tend to bridge gaps between subdisciplines of biology or between biology and other disciplines, the areas of concentration are not rigidly defined. There are special programs in aquatic ecology, evolution and environmental biology, cellular and molecular biology, developmental biology, microbiology, parasitology, physiology, vector biology, and wastewater treatment, but even within each of these programs there is considerable flexibility in the choice of courses. Students are expected to plan, with their advisory committee, a program of courses and research appropriate to their individual needs.

In addition to the University-wide requirements of the Graduate School, applicants for admission to graduate studies in this department should be adequately prepared in general biology, physics, organic chemistry, mathematics through calculus, and one or more areas of the life sciences. Course deficiencies in these certain areas and prerequisites for advanced graduate courses may be made up at Notre Dame.
The master’s degree is a 24-credit-hour program requiring the satisfactory completion of a minimum of 18 credit hours of course work, passing a research proposal review, and completing a suitable master’s thesis. A student must include six of the 24 credit hours in thesis research.

For the degree of doctor of philosophy, the student is expected to complete a 72-credit-hour requirement. This is composed of at least 24 credit hours of course work and the remainder as thesis research. The student must pass a comprehensive examination consisting of both an oral and a written examination, write and officially have approved a dissertation on research conducted under the direction of an adviser and committee, and pass a defense of the dissertation.

Students in the doctoral degree program must also fulfill a one-year teaching requirement that usually involves assisting in the instruction of undergraduate or graduate laboratory courses. This requirement may be automatically fulfilled if the student has a graduate assistantship for financial aid.

Incoming graduate students may be assigned an interim faculty adviser by the director of graduate studies. These assignments are made with consideration of the specific academic interests of the student. It is the responsibility of the interim adviser to guide the student’s program until a research adviser is selected. By the end of the first semester of the second year of residence the Ph.D. student must have chosen a faculty member as a research adviser and have begun a research program. The master’s student should choose an adviser by the end of the first year of residence. The student, in consultation with his or her adviser, selects an advisory committee. The members of this committee will contribute guidance, expertise, and stimulation to the student in his or her graduate program and will serve as the examining committee for the candidacy examinations and for the final defense.

Financial Assistance
Students are offered financial assistance on a competitive basis, with consideration given to grades, GRE examination scores, recommendations, and other factors. The University offers three types of support to full-time graduate students: fellowships, graduate and research assistantships, and tuition scholarships. Students may receive one type of support or a combination of several types. A number of fellowships for women and minorities are available. To be considered, Biological Sciences requires that all application materials must be received by the Graduate Admissions Office by February 1.

Most graduate students in Biological Sciences are awarded full tuition scholarships and are supported as teaching or research assistants (TAs or RAs). A student supported by a teaching assistantship typically works 10 to 12 hours per week. Typical duties include teaching in an undergraduate laboratory section, setting up the laboratory, and grading papers. The student also takes classes and is expected to carry on thesis research. TA appointments are for nine months and are generally supplemented with a two- or three-month summer stipend from the university faculty research grants and/or departmental funds. A student supported by a research assistantship registers for some classes and carries out thesis research under a faculty research adviser. RA support comes from government, industrial, or private grant funds. RA appointments are generally for 12 months.

Course Descriptions
Each course listing includes:
– Course Number
– Title
– (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
– Instructor
– Course Description
– (Semester normally offered)

504. Developmental Genetics
(3-3-4) Staff
Prerequisite: An introductory genetics (BIOS 250 or BIOS 303) or equivalent. Selected topics in developmental genetics dealing with mechanisms of gene action. Consideration of the role of genes in the embryology, morphology, physiology, and behavior of organisms. (On demand)

508. Population Genetics
(3-0-3) Feder
Prerequisite: An introductory genetics (BIOS 250 or BIOS 303) or equivalent. This course will describe and mathematically analyze the processes responsible for genetic change within populations. (Fall: on demand)
520. Arbovirology (2-0-2) Grimstad
Prerequisite: Consent of instructor.
A study of the methods and mechanisms of transmission of viruses by arthropod vectors and of the life histories of the vectors as they pertain to viral transmission. (Spring; on demand)

520L. Arbovirology Laboratory (0-3-1) Grimstad
Prerequisite: BIOS 520 or concurrent.
Laboratory studies on arthropod-borne viruses. (Spring; on demand)

524. Ichthyology (3-3-4) Goetz
Prerequisite: Consent of instructor.
The evolution, taxonomic classification, anatomy, physiology, aquaculture, and zoogeography of fishes, with an examination of the life history of selected species. (Fall; on demand)

524L. Ichthyology Laboratory (0-3-1) Goetz
Corequisite: BIOS 524 and consent of instructor.
An examination of fish species reflecting lecture topics. (Fall; on demand)

525. Community Ecology (3-0-3) Lodge
Prerequisite: General Ecology (BIOS 312) or equivalent.
Community ecology concepts, historical development, philosophical, and methodological approaches. Emphasis is on competition, predation, temporal, and spatial variability, exotic species, and food webs. (On demand)

527. Stream Ecology (3-0-3) Lamberti
Prerequisite: General Ecology (BIOS 312) or equivalent.
This course explores the interaction of biological, chemical, and physical features of streams and rivers. Quantitative analysis of stream biota and periodic physical features is conducted during field laboratory sessions. Human impacts on flowing waters are explored, along with current theory of stream ecology. (Fall; on demand)

528. Environmental Microbiology (2-0-2) Kulpa
Prerequisite: Permission of instructor.
A characterization of the roles of microbes in natural and man-made environments; their interrelations with each other, with higher organisms, and with human affairs. (Spring; on demand)

530. Immunobiology of Infectious Disease (3-0-3) Adams and Schorey
Prerequisite: BIOS 462, 415, 435, or permission of instructor.
This course provides a critical overview of various infectious organisms and how they interact with their host. Examples will include intracellular and extracellular pathogens, generation of toxins, molecular mechanisms of invasion, and immune activation and protection. Students will be expected to give oral presentations based on critical review of primary literature as well as written reports. (Fall; on demand)

531. Molecular Biology I (3-0-3) Huber
Prerequisite: BIOS 156, 202, CHEM 224, 248, or equivalent.
The first of a two-semester sequence that will provide an introduction to molecular biology, molecular genetics, and nucleic acid biochemistry. Lecture topics include: physical chemistry of nucleic acids, bacterial genetics, principles of cloning, DNA replication and recombination, prokaryotic and eukaryotic transcription, and RNA processing and translation. Listed also as CHEM 531. (Fall)

532. Molecular Biology II (3-0-3) O'Tousa
Prerequisite: BIOS 531
The second semester of the sequence. Lecture topics include: transposable elements, yeast genetics, gene families, molecular aspects of development, animal viruses, and computer-assisted analysis of nucleic acids and proteins. Listed also as CHEM 532. (Spring)

533. Proteins and Nucleic Acids (3-0-3) Staff
The structure, stability, and interactions of proteins and nucleic acids will be discussed. The chemical rules by which these biological macromolecules operate will be examined. (On demand)

535. Comparative Endocrinology (3-0-3) Boyd
A systematic comparative analysis of chemical mediation in biological systems with special emphasis on vertebrate species. A study of the structure and function of endocrine tissues, the biochemistry of hormones and their effects on the physiology and behavior of organisms. (On demand)

536. Advanced Virology (3-0-3) Fraser
Prerequisite: Consent of instructor.
Current molecular aspects of virology including diagnosis, prevention, therapy, and genetic manipulation. (On demand)

538. Neurobiology (3-0-3) Staff
Prerequisite: A physiology course.
Objectives: Morphology and function of the different nervous systems found in animals. The role of receptors and effectors shall be discussed. Special attention will be given to questions of neuronal control of behavior patterns. (On demand)

539. Advanced Cell Biology (3-0-3) Shay
Advanced Cell Biology is an upper-level course directed at graduate students and advanced undergraduates with previous background in cell and molecular biology. The course focuses on the molecular basis and regulation of cell structure and function, covering key topics that include membrane structure, function, and transport, cellular energetics, organelle biogenesis, protein trafficking, vesicular transport, signaling, and cytoskeletal function. (On demand)

554. Biological Research Applications of Computers (3-2-4) Hellenthal
Prerequisite: Consent of instructor.
Data processing techniques that have direct application to biological research and teaching. Emphasis is on the use of computers for the solution of specific biological data handling and analysis of problems. (Spring; on demand)

556. Histology (3-3-4) Staff
Prerequisite: Consent of instructor.
An in-depth examination of the normal structure of vertebrate animal tissues and cells. Histological techniques (fixation, embedding, staining) will be taught in the laboratory. (On demand)

558. Biological Electron Microscopy (3-3-4) Staff
Prerequisite: Consent of instructor.
Characteristics and biological applications of transmission and scanning electron microscopy. Current methods in ultrastructural preparation and analysis. (On demand)
560. Environmental Physiology and Biochemistry
(3-0-3) Duman
Prerequisite: A course in physiology.
A course concentrating on physiological and biochemical adaptations that enable organisms to exist under extremes of such environmental variables as temperature, oxygen concentration, osmotic concentration, pressure, water availability, pH, etc. (Fall: on demand)

561. Advanced Aquatic Ecology
(3-3-4) Lodge
Prerequisite: An ecology course.
Population interactions, community analysis, biogeochemical cycles, and ecosystem structure and functioning in streams, lakes, and oceans. (On demand)

562. Aquatic Insects
(3-3-4) Hellenthal
Prerequisite: A course in entomology, invertebrate zoology, or ecology.
The taxonomy and ecology of insects having aquatic stages in their life cycles. (Spring: on demand)

563. Wetland Ecology
(3-0-3) Bridgham
Prerequisites: BIOS 312, 312L, or equivalent and consent of instructor.
Cycling of nutrients and carbon, plant communities, hydrology, successional development, and management in wetland ecosystems will be explored. Several Saturday field trips are mandatory. (On demand)

564. Behavioral Ecology
(3-0-3) Lodge
Prerequisite: An ecology course.
Emphasis is placed on the behavioral components of species interactions and their importance in natural selection and population regulation. Topics include: adaptations and natural selection, group and kin selection, sociality and cooperation, sexuality and mating systems, predator and prey behavior, behavior of competitors, territoriality, coevolutionary arms races, signals, thermoregulation, and habitat selection. (On demand)

568. Introduction to UNDERC
(1-0-1) Hellenthal
Open only to students previously accepted into the UNDERC program. (Spring)

569. Practicum in Aquatic Biology
(V-V-6) Staff
Practical training in aquatic and environmental biology through lecture and field experience at the University’s environmental research facility located in northern Wisconsin and the upper peninsula of Michigan. Course includes an independent research project. (Summer)

570. Topics in Cell Biology
(V-V-V) Staff
Prerequisite: Consent of instructor.
A course offered when demand warrants it. Subject matter changes depending on students’ needs. Prospective subjects include bioisotopes or chemistry of cell organelles. (On demand)

571. Topics in Physiology
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective subjects include invertebrate and vertebrate physiology. (On demand)

571A. Physiology Practicum
(V-V-V) Staff

572. Topics in Botany
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective subjects include plant taxonomy or biology of lower plants. (On demand)

573. Topics in Ecology
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective subjects include systems analysis in ecology or biogeography. (On demand)

574. Topics in Evolutionary and Systematic Biology
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective subjects include numerical taxonomy and population genetics. (On demand)

575. Topics in Developmental Biology
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective subjects include developmental physiology, determination and differentiation, extracellular matrix, and invertebrate development. (On demand)

576. Topics in Biocomputing
(V-V-1) Staff
Prerequisite: Consent of instructor.
A specific area concerning the use of computers in biology will be covered each time the course is given. Lectures, demonstrations, and laboratory are variable, depending upon the subject treated. (Spring: on demand)

577. Topics in Genetics/Molecular Biology
(V-V-V) Staff
Prerequisites: BIOS 501 and CHEM 623.
Selected topics in molecular biology as reflected by the current literature. Students will be expected to present one-third of the lecture material and will not be accepted unless the prerequisites are met. In special cases they may be admitted at the discretion of the instructor. (On demand)

578. Scientific Writing
(3-0-3) Boyd
Students are instructed in the skills needed to write publication-quality manuscripts. (On demand)

579. Topics in Parasitology and Vector Biology
(V-V-V) Staff
Prerequisite: Consent of instructor.
Subject matter changes depending on students’ needs. Prospective topics include specific diseases (e.g., Malaria, dengue), molecular genetics of vectors, bioinformatics, and others. (On demand)

580. Seminars
(1-0-1) Staff
Advanced level, current topics in the areas listed below. An introductory course in the area or consent of the instructor is usually required.
- A. Ecology
- B. Developmental Biology
- C. Physiology/Neurobiology/Behavior
- D. Genetics/Molecular Biology
- E. Parasitology/Vector Biology
- F. Cell Biology/Microbiology

599. Thesis Direction
(V-V-V) Staff
(Every semester)

600. Nonresident Thesis Research
(0-0-1) Staff
Students away from campus register for one credit hour each semester during regular academic year only. (Every semester)
611. Experimental Parasitology
(3-3-4) Staff
Prerequisite: Consent of instructor.
A seminar and laboratory on current methods used in parasitological research. Protozoan, helminth, and arthropod parasites will be considered. (On demand)

622. Advanced Immunology
(3-0-3) Adams
Prerequisites: Principles of Microbiology, immunology, biochemistry.
A course concerned with the immunocompetency of antigens, antibodies, and their interaction. Antibody biosynthesis and the cellular aspects of the immune response are also considered. (On demand)

663, 664, 665. Methods in Cellular and Molecular Biology
(V-V-V) Staff
Prerequisite: Permission of instructor.
Laboratory instruction in biochemical, molecular biological, and immunological techniques. The course is divided into three nine-week sections: protein purification and modification, gene cloning and expression, immunology and cellular immunology. Students will learn a wide range of methodologies intended to prepare them for research. (Fall and spring: on demand)

671. Special Problems
(V-V-V) Staff
Special topics in the field of interest of individual graduate students. (Every semester)

680. MBP Seminar
(V-V-V) Staff
Special seminar series for MPB participants.

699. Research and Dissertation
(V-V-V) Staff
(Every semester)

700. Nonresident Dissertation Research
(0-0-1) Staff
Students away from campus register for one credit hour each semester during regular academic year only. (Every semester)

Other graduate courses taught on an irregular basis:

501. Advanced Molecular Genetics
502. Genetics of Lower Eukaryotes
503. Advanced Microbial Physiology
506. Cytogenetics
509. Plant Anatomy
510. Experimental Parasitology
512. Helminthology
517. Biological Microtechniques
523. Practicum in Environmental Biology
526. Invertebrate Pathology
534. Plant Physiology
537. Microbial Genetics
541. Physical Chemistry for Biologists
565. Nutrition
590. Seminar in Microbial Genetics
681. Special Problems in Microbiology

Faculty

GARY E. BELOVSKY, Gillen Director of UNDERC and Professor. B.B.A., University of Notre Dame, 1972; M.F.S., Yale University, 1972; Ph.D., Harvard University, 1977. (2001)


NORA J. BESANSKY, Associate Professor. B.S., Oberlin College, 1982; M.S., M.Phil., Yale Univ., 1987; Ph.D., ibid., 1990. (1997)


FRANK H. COLLINS, George and Winifred Clark Professor of Biological Sciences. A.B., Johns Hopkins Univ., 1966; M.A., Univ. of East Anglia, 1973; M.S., Univ. of California, Davis, 1980; Ph.D., ibid., 1981. (1997)


JOHN G. DUMAN, Chair and Martin J. Gillen Professor. B.S., Pennsylvania State Univ., 1968; Ph.D., Univ. of California, San Diego, Scripps Institute of Oceanography, 1974. (1974)


MICHAEL T. FERDIG, Assistant Professor. B.S., University of Nebraska, Lincoln, 1987; M.S., ibid., 1990; Ph.D., University of Wisconsin, Madison, 1997. (2001)

MALCOLM J. FRASER JR., Associate Professor. B.S., Wheeling College, 1975; M.S., Ohio State Univ., 1979; Ph.D., ibid., 1981. (1983)

FREDERICK W. GOETZ JR., Director of Graduate Studies and Professor. B.A., Colgate Univ., 1972; Ph.D., Univ. of Wisconsin, 1976. (1977)

PAUL R. GRIMSTAD, Director of Undergraduate Studies, Assistant Chair and Associate Professor. B.A., Concordia College, 1967; M.S., Univ. of Wisconsin, 1972; Ph.D., ibid., 1973. (1976)

KRISTIN M. HAGER, Assistant Professor. B.Sc., University of Illinois, 1989; Ph.D., University of Alabama, Birmingham, 1996. (2000)

RONALD A. HELLENTHAL, Assistant Chair and Professor. A.A., Los Angeles Valley College, 1965; B.A., California State Univ., Northridge, 1967; Ph.D., Univ. of Minnesota, 1977. (1977)

EDWARD H. HINCHCLIFFE, Assistant Professor. B.Sc., Univ. of Dayton, 1989; Ph.D., Univ. of Minnesota, 1995. (2001)


CHARLES F. KULPA JR., Director of the Center for Environmental Science and Technology and Professor. B.S., Univ. of Michigan, 1966; M.S., ibid., 1968; Ph.D., ibid., 1970. (1972)

GARY A. LAMBERTI, Professor. B.S., Univ. of California, Berkeley, 1975; Ph.D., Univ. of California, Davis, 1983. (1990)


MARY ANN McDOWELL, Assistant Professor. B.S., University of Nebraska, Lincoln, 1988; M.S., ibid., 1990; Ph.D., University of Wisconsin, Madison, 1995. (2001)

REV. JAMES J. McGRATH, C.S.C., Assistant Chair and Associate Professor. A.B., Univ. of Notre Dame, 1955; M.A., Univ. of California, 1963; Ph.D., ibid., 1966. (1965)
KENNETH R. OLSON, Adjunct Professor, B.S., Univ. of Wisconsin, LaCrosse, 1969; M.S., Michigan State Univ., 1970; Ph.D., ibid., 1975. (1975)

JOSEPH E. O’TOUSA, Director of the Program in Molecular Biosciences and Professor, B.S., Univ. of California, Irvine, 1976; Ph.D., Univ. of Wisconsin, 1980. (1985)

JEANNE ROMERO-SEVERSON, Adjunct Assistant Professor, B.S., Univ. of Wisconsin, Madison, 1974; M.S., ibid., 1975; Ph.D., ibid., 1984. (1997)

JEFFREY S. SCHOREY, Assistant Professor, B.Sc., Southeast Missouri State Univ., 1985; Ph.D., Univ. of Texas Health Science Center, San Antonio, 1991. (1998)


JENNIFER L. TANK, Galla Assistant Professor, B.S., Michigan State University, 1988; M.S., Virginia Polytechnic Institute and State University, 1992; Ph.D., ibid., 1996. (2000)

MARTIN P. TENNISWOOD, Coleman Professor of Life Sciences. B.Sc., Trent Univ., Ontario, 1973; Ph.D., Queen’s Univ., 1979. (1998)


Chemistry and Biochemistry

Chair: A. Graham Lappin
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The Program of Studies

The graduate programs in chemistry and biochemistry at Notre Dame are directed toward the master’s and Ph.D. degrees. Applications are taken from students seeking either degree in either chemistry or biochemistry.

The Ph.D. program is designed to prepare the student for a career in research or college-level teaching in chemistry, biochemistry, and related fields. Advanced courses in several areas of chemistry and biochemistry are available (see list below) along with regular seminars and special topics courses. Students usually begin active research during the first summer of their graduate program. Admission to candidacy for the doctoral degree occurs after completion of written and oral examinations in the area of specialization.

The department considers teaching an integral part of the education of a graduate student. Teaching performance, therefore, is considered as part of the semiannual graduate student evaluations. A minimum of one year of teaching experience is required of all advanced degree-seeking students.

Both the Ph.D. and master’s degrees require a dissertation based upon experimental and/or theoretical research performed in one of the four major areas: physical chemistry, organic chemistry, inorganic chemistry, or biochemistry. The department participates in interdisciplinary programs involving the departments of biological sciences, physics, and engineering. (See particularly “Molecular Biosciences Program” under Interdisciplinary Programs in this Bulletin.) A student normally selects his or her area of research by the end of the first semester.

The Department of Chemistry and Biochemistry has excellent facilities for research, including most modern instruments for investigations in the major areas of chemistry and biochemistry. In addition to equipment found in the research laboratories of individual faculty members, department facilities include the Lizzadro Magnetic Resonance Research Center, the College of Science Biosciences Core Facility, the Center for Transgene Research, Walther Cancer Institute Center of Excellence in Cancer Research, the Molecular Structure and Mass Spectrometry Facilities, and the Surface Science Laboratory. The latter is maintained jointly by the departments of chemistry and biochemistry and electrical engineering. In addition to holdings in Hesburgh Library, all the major chemical, biochemical, and biophysical specialty journals are available in the Chemistry-Physics Research Library located in Nieuwland Science Hall. Other relevant holdings are found in the Life Sciences Library located in Galvin Life Sciences Center. The Radiation Research Laboratory, which is operated by the U.S. Department of Energy, is one of the world’s leading research centers in radiation chemistry and draws scientists from all over the world to the Notre Dame campus. The laboratory has a staff of approximately 20 research scientists, two of whom have joint appointments in the Department of Chemistry and Biochemistry (see Radiation Laboratory in this Bulletin).

Currently, there are over 100 graduate students and approximately 25 postdoctoral investigators in the department. Visiting scientists from the United States and foreign countries are often in residence.

Course Descriptions

Each course listing includes:
— Course Number
— Title
— (Lecture hours per week— laboratory or tutorial hours per week—credits per semester)
— Instructor
— Course Description
— (Semester normally offered)

420. Principles of Biochemistry (3-0-3) Biochemistry Staff
A general treatment of the various areas of modern biochemistry; intermediary metabolism, bioenergetics, molecular basis of genetic and developmental processes, and cellular mechanisms. (Fall and spring)

443. Inorganic Chemistry (3-0-3) Sevov
Group Theory, Molecular Orbital Theory, structure, and spectroscopy are used as vehicles for the introduction of molecules from inorganic, organometallic, solid state, and organic chemistry. (Fall)

521. Fundamentals of Biochemistry (3-0-3) Nowak
The chemical properties of biological molecules such as amino acids, proteins, nucleotides, carbohydrates, lipids, and enzymes. Physical and chemical principles are utilized to understand biological processes. (Fall)
522. Intermediary Metabolism
(3-0-3) Goodson, Basu
Prerequisite: CHEM 521.
A study of the chemical reactions characteristic of living systems: mechanisms, regulation, and energetics of metabolism. (Spring)

531. Molecular Biology I
(3-0-3) Huber
The first of a two-semester sequence that provides an introduction to molecular biology, molecular genetics, and nucleic acid biochemistry. Topics include: physical chemistry of nucleic acids, bacterial genetics, principles of cloning, DNA replication and recombination, prokaryotic and eukaryotic transcription, and RNA processing and translation. Listed also as BIOS 531. (Fall)

532. Molecular Biology II
(3-0-3) Biochemistry Staff
The second semester of the sequence. Lecture topics include: yeast genetics and molecular biology; retroviruses and transposable elements; transgenic mice; and special topics covering cell cycle regulation, oncogenes, development in Drosophila, signal transduction, and cloning of human disease genes. (Spring)

535. Medicinal Chemistry
(3-0-3) Organic Chemistry Staff
Prerequisite: CHEM 224 or equivalent.
The chemical, biological, and medical aspects of medicinal agents. The course will include CNS depressants, CNS stimulants, benzodiazepines, cardiovascular agents, analgesics, cascades (arachidonic acid, renin, peptides) antibiotics, cancer, transmitters, teratogens, metabolism, drug design, cholesterol, anti-inflammatory agents, antiulcer agents, Alzheimer’s and Parkinson’s diseases. (Every other fall)

599. Thesis Direction
(V-V-V) Staff
M.S. research.

601, 602. Seminar in Chemistry
(V-0-0) (V-0-0) Staff
Prerequisite: Registration as graduate student in chemistry.
Lectures by invited speakers.

607, 608. Special Topics in Biochemistry
(3-0-3) (3-0-3) Staff
Recent offerings have included: Advanced Laboratory Techniques in Biochemistry; MO’s in Organic Metallurgy X-ray Crystallography.

611, 612. Seminar in Inorganic Chemistry
(1-0-1) (1-0-1) Inorganic Chemistry Staff

615. Inorganic Mechanisms
(3-0-3) Brown, Fehlner
A general treatment of the mechanisms of inorganic reactions, including an examination of the sources of mechanistic data. (Every other fall)

616. Solid State and Cluster Chemistry
(3-0-3) Sevov, Fehlner
A survey of synthesis, structure (geometric and electronic), spectroscopic, dynamic properties, and reactivity of solid state and molecular cluster compounds of the main group and transition metal elements. (Spring)

617, 618. Special Topics in Inorganic Chemistry
(V-0-V) (V-0-V) Inorganic Chemistry Staff
Recent offerings have included: Advanced Laboratory Techniques in Inorganic Chemistry; MO’s in Organometallics X-ray Crystallography.

620. Bioinorganic Chemistry
(3-0-3) Scheidt
The role of metals in biological systems. (Every other spring)

621, 622. Seminar in Biochemistry
(1-0-1) (1-0-1) Staff

623. Enzyme Chemistry
(3-0-3) Nowak
Prerequisite: CHEM 522.
Physical and chemical properties and mechanism of action of enzymes and their role in metabolic processes. (Every other spring)

624. Advanced Biochemical Techniques
(2-6-4) Biochemistry Staff
Prerequisite: Permission of instructor.
Advanced laboratory in biochemical techniques with emphasis on protein purification, enzyme kinetics, carbohydrate analysis, and DNA cloning and sequencing. (Spring)

626. NMR Spectroscopy in Chemistry and Biochemistry
(3-0-3) Serianni
A survey of modern NMR methods used to determine molecular structure and conformation, study chemical and biochemical reactivity, and probe metabolic processes in biological systems. 1D, 2D and 3D spectroscopy and MRI/MRS are treated. (Every other year)

627, 628. Special Topics in Biochemistry
(V-0-V) (V-0-V) Biochemistry Staff
Prerequisite: Permission of instructor.
Recent offerings have included: Glycoconjugates; Spectroscopy in Biochemistry; Chemistry and Biology of RNA.

631, 632. Advanced Organic Chemistry I, II
(3-0-3) (3-0-3) Wiest, Miller
The theoretical basis of organic reaction mechanisms and a detailed study of the preparation and reactions of organic functional groups. (Fall and spring)

634. Structure Elucidation
(3-0-3) Organic and Inorganic Staff
The interpretation of data from NMR, IR, MS, UV, X-ray methods with an emphasis on the practical as opposed to the theoretical point of view. (Spring)

635, 636. Seminar in Organic Chemistry
(1-0-1) (1-0-1) Organic and Chemistry Staff

637, 638. Special Topics in Organic Chemistry
(V-0-0) (V-0-0) Organic Chemistry Staff
Recent offerings have included: Advanced Physical Organic Chemistry; Computers in Chemistry; Enzymes in Organic Synthesis; Chemical Basis of Gene Expression.

639. Synthetic Organic Chemistry
(3-0-3) Taylor
Prerequisite: CHEM 632.
A systematic and critical study of the synthetic methods of modern organic chemistry including the development of multistage syntheses. (Fall)

641. Statistical Mechanics I
(3-0-3) Gezelter
Foundations of statistical mechanics; canonical, microcanonical, and grand canonical ensembles; thermodynamic properties of chemical substances in terms of partition functions; chemical equilibrium; thermal radiation; quantum statistics; chemical kinetics and the approach to equilibrium. (Spring)

642. Chemical Kinetics
(3-0-3) Thomas
Rates and mechanisms of chemical reactions in the condensed phase; formalisms, theory. (Fall)

643, 644. Seminar in Physical Chemistry
(1-0-1) (1-0-1) Physical Chemistry Staff
that examine the detailed mechanisms by which atoms and molecules react. Topics include potential energy surfaces, impact parameters, energy consumption and disposal, classical trajectory simulations, and quantum scattering methods. (Every other year)

680. Seminar in Biochemistry, Biophysics and Molecular Biology (1-0-1) Jacobs Staff
Current offering is: Computer Simulation of Organic and Biological Molecules.

697. Directed Readings (V-V-V) Staff
Molecular Spectroscopy
Prerequisite: CHEM 652
(3-0-3) Gezelter, Wiest
652. Molecular Spectroscopy (3-0-3) Hartland
Prerequisite: CHEM 649 or permission of instructor.
A study of the interaction of light with matter, at the single- and multi-photon level. Topics include group theory, molecular vibrational analysis, non-separability of electronic, vibrational, and rotational motion, angular momenta coupling, and time-independent and time-dependent perturbation theory. (Every other year)

650, 651. Computational Chemistry I, II (3-0-3) (3-0-3) Gezelter, Wiest
An overview of the fundamental theory, methodology, and applications of computational chemistry. Topics include simulation techniques such as molecular dynamics and Monte Carlo as well as a wide range of quantum chemistry methods. Applications center on organic molecules and biological systems such as proteins and DNA. Hands-on computer experience is an integral part of these courses. (Fall and spring)

652. Molecular Spectroscopy (3-0-3) Hartland
Prerequisite: CHEM 649 or permission of instructor.
A study of the interaction of light with matter, at the single- and multi-photon level. Topics include group theory, molecular vibrational analysis, non-separability of electronic, vibrational, and rotational motion, angular momenta coupling, and time-independent and time-dependent perturbation theory. (Every other year)

653. Surface Chemistry (2-0-2) Jacobs, Lieberman, Thomas
The chemistry and physics of surfaces and interfaces.

655. Chemical Reaction Dynamics (3-0-3) Jacobs
Prerequisite: CHEM 649 or permission of instructor.
An overview of experiments and theories that examine the detailed mechanisms by which atoms and molecules react. Topics include potential energy surfaces, impact parameters, energy consumption and disposal, classical trajectory simulations, and quantum scattering methods. (Every other year)

680. Seminar in Biochemistry, Biophysics and Molecular Biology (1-0-1) Jacobs Staff
Current offering is: Computer Simulation of Organic and Biological Molecules.

697. Directed Readings (V-V-V) Staff
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The Program of Studies

The purpose of the doctoral program in mathematics is to assist students in developing into educated, creative, and articulate mathematicians. The program consists of basic courses in the fundamentals of algebra, analysis, geometry, logic, and topology; more advanced topics and seminars; and approximately two to three years of thesis work in close association with a member of the faculty. Limited enrollment and the presence of active groups of strong mathematicians provide excellent opportunities for research in algebra, complex analysis, partial differential equations, logic, algebraic geometry, differential geometry, topology, and applied mathematics. Most students complete the program within five years; some finish in four years; a few in three.

Students are supported by fellowships and teaching assistantships. Students’ teaching responsibilities are integrated into their professional development as mathematicians.

First-year students have no teaching duties and usually devote their full time to courses. The oral candidacy examination is taken during the second year. A reading knowledge of one approved language, in addition to English, is required.

The Department of Mathematics has its own building with good computer facilities and a comprehensive research library of over 27,000 volumes that subscribes to 275 current journals. Graduate students are provided with comfortable office space and are assured a stimulating and challenging intellectual experience.

Areas of Research

Applied Mathematics

The Department of Mathematics has over half-a-dozen faculty members actively involved in a variety of areas of mathematics and its applications to physics, engineering, and problems arising from industry. The research disciplines they are pursuing, often in conjunction with members of other departments at Notre Dame, include the following: dynamical systems and partial differential equations, control theory (design, optimal, and stochastic), geometric mechanics, optimization theory, interior point algorithms, coding theory, numerical analysis of polynomial systems, and stochastic analysis (nonlinear filtering).

As an example, in collaboration with several faculty in the electrical engineering department we investigate the algebraic properties of block codes and convolutional codes. Coding theory is concerned with the storage and transmission of information and the ability to recover the information as completely as possible even if some of the data are lost. A good example is the genetic code stored in a DNA molecule or the ISBN numbers used by book publishers. Coding theory is widely applied in data communication and mathematically it is interconnected with algebraic geometry on the algebraic side and with information theory on the analytic side.

Algebraic Geometry

At its heart, algebraic geometry studies the geometry of the solution sets of systems of polynomials. Such sets include parabolas, spheres, Euclidean space, projective spaces, and a vast array of beautiful and intricate concrete curves, surfaces, and higher dimensional sets. In the Department of Mathematics there is research in many parts of this subject, including adjunction theory, Castelnuovo theory, curve theory, various aspects of the projective classification of varieties, the study of group actions, liaison theory, and the numerical analysis of polynomial systems. There is also activity in nearby areas dealing with coding theory and with nonlinear partial differential equations.

Differential Geometry

The striking feature of modern differential geometry is its breadth, which touches so much of mathematics and theoretical physics, and the wide array of techniques it uses from areas as diverse as ordinary and partial differential equations, complex and harmonic analysis, operator theory, topology, ergodic theory, Lie groups, non-linear analysis, and dynamical systems. Research at Notre Dame covers the following areas at the forefront of current work in geometric analysis and its applications.

1. Geodesics, minimal surfaces, and constant mean curvature surfaces

The global structure of a space may be investigated by the extensive use of geodesics, minimal surfaces, and surfaces of constant mean curvature; such surfaces are themselves of physical interest (membranes, soap films, and soap bubbles). An important problem in the area is the determination of conditions on a compact Riemannian space that ensure the existence of infinitely many geometrically-distinct closed geodesics. We have proved this for compact Riemannian spaces with positively pinched curvature and in another direction established that if two compact surfaces of negative curvature and finite area have the same length data for marked closed geodesics, then the two surfaces must be isometric. Our research on minimal surfaces has produced a series of
outstanding results on what have long been recognized as crucial problems for the theory. These include the first breakthrough to finiteness in the extension of the classical Bernstein Theorem, the recent proof of the uniqueness of the helicoid as the only non-flat complete embedded simply-connected minimal surface in three-space, and the first solution of the free boundary problem for polyhedral surfaces, the prototype for Jost’s Theorem. Our far-reaching generalization of the classical work of Delaunay classified all complete constant mean curvature surfaces admitting a one-parameter group of isometries; the new infinite families of such surfaces generated by this work are currently of interest in other areas of surface theory.

2. Classical surface theory

Classical surface theory is the study of isometric immersions of surfaces into Euclidean three-space. In this study the umbilic points have a special significance (both topologically and geometrically) and the Caratheodory conjecture of 80 years standing is one of the most resistant of problems in this area. Beginning with a generic geometric solution to this conjecture and the establishing of a remarkable connection with the theory of compressible plane fluid flow, we have made profound contributions to our understanding of this phenomenon, so that these purely mathematical results are now being applied to the solution of fundamental problems in the theory of relativity. Our work is an integral part of Rozoy’s celebrated solution of the Lichnerowicz Conjecture that a static stellar model of a (topological) ball of perfect fluid in an otherwise vacuous universe must be spherically symmetric; this includes, as a special case, Israel’s theorem that static vacuum black-hole solutions of Einstein’s equations are spherically symmetric, i.e., Schwarzschild solutions.

3. Complex geometry and analysis on non-compact manifolds

Our work in complex geometry includes the affirmative solution of the Bochner Conjecture on the Euler number of ample Kaehler manifolds, a solution of Bloch’s Conjecture (on the degeneracy of holomorphic curves in subvarieties of abelian varieties) and the classification of complex surfaces of positive bi-sectional curvature. Our current research on this area focuses on complex manifolds with non-positive curvature, exhibiting various manifestations of hyperbolicity and parabolicity. Much of the progress in Riemannian geometry that took place over the last decades has been made via the use of deep analytic techniques on non-compact manifolds. The central object of study is the Laplace operator, acting on functions and on differential forms. Our work on the spectral theory of the Laplacian uses techniques from quantum mechanical scattering theory. A recent example has been one proof that the Laplacian of the four-dimensional hyperbolic space is rigid, in the Hilbert space sense. Probabilistic methods, coming from the theory of Brownian motion, have also been used with success in our discovery of a new family of Liouville manifolds having a positive lower bound for the Laplacian spectrum; these manifolds provided counter-examples to a conjecture of Schoen and Yau on Liouville manifolds. Another recent accomplishment in the study of Laplace operators has been a vanishing theorem for $L^2$-co-homology and its applications, via index theory, to the Euler number of non-positively curved compact Kaehler manifolds.

4. Geometric analysis via Gromov’s methods

Over the last 30 years Gromov has made important contributions to diverse areas of mathematics and pioneered new directions in mathematics such as filling Riemannian geometry, almost flat manifolds, word-hyperbolic groups. Carnot geometry, and applications to the rigidity of symmetric spaces, to name but a few. Our work on geometric analysis via Gromov’s approaches includes an affirmative solution to Gromov’s minimal volume gap conjecture for compact manifolds of non-positive curvature, isoperimetric inequalities on singular spaces of non-positive curvature, and the study of harmonic functions on non-compact spaces with Gromov’s hyperbolicity.

5. Spaces of positive scalar curvature

In the past 10 years it has been observed that there are profound connections between the existence of metrics with positive scalar curvature on a given compact space and the topological structure of the space. An outstanding problem in this area is the existence of metrics of positive scalar curvature on compact spin manifolds. Gromov-Lawson conjectured that any compact simply-connected spin manifold with vanishing A-genus must admit metric of positive scalar curvature. The expert in this area at Notre Dame successfully solved this important problem by a detailed study of positive scalar curvature metrics on quaternionic fibrations over compact manifolds. In addition, our researchers have been interested in the study of metrics of positive scalar curvature on certain compact manifolds such as exotic spheres. It has also been found that the topological K-theory is closely related to the study of manifolds with non-positive sectional curvature.

Algebra

Lie Representation Theory

The Lie representation theory group at Notre Dame studies the representation theory of a variety of important mathematical structures including Lie groups and Lie algebras, finite and algebraic groups, and quantum groups by means of a range of algebraic, combinatorial, and geometric tools. In addition to research in problems involving the detailed structure of specific representations (problems such as constructing and parametrizing representations, and studying their dimensions, tensor products, extensions, etc.), the group is also undertaking research into global properties of representation categories (e.g., their relationships with one another and with categories arising naturally in geometry or combinatorics).

1. Structure of Lie representation categories

The Weyl group and its root system play an important role in the structure and representation theory of many objects of Lie type, including semisimple Lie groups and Lie algebras, finite groups of Lie type, algebraic groups, Kac-Moody Lie algebras and groups, and quantum groups. In these contexts, the Weyl group is a finite (or in general, discrete) reflection group acting on a free abelian group (i.e., a crystallographic Coxeter group). Striking similarities have been observed between certain categories of infinite dimensional representations over several of these objects; for instance, character formula often can be expressed in terms of Kazhdan-Lusztig polynomials, that may be defined combinatorially for an arbitrary, possibly non-crystallographic Coxeter group.

Stimulated initially by combinatorial questions concerning Kazhdan-Lusztig polynomials, we have initiated the study of a number of representation categories that are naturally associated to arbitrary Coxeter groups. A first goal of this research is to establish in general several basic series of conjectures (standard conjectures) on these categories. One set of conjectures would give very precise information on the characters of principal series modules in terms of analogues of certain data arising in combinatorics (shellings of posets). A
second set would imply that certain vector spaces arising in the theory are naturally equipped with structure analogous to that on the intersection cohomology space of a complex projective variety. A third set of conjectures involve Koszulity of certain standard modules arising in the theory, and Koszul duality of certain pairs of these representation categories.

A second part of the research is directed towards establishing relationships (e.g., a number of conjectured category equivalences) between the representation theories associated to crystallographic Coxeter groups, and various categories (e.g. highest weight categories, categories of perverse sheaves on flag varieties) of representation-theoretic or geometric interest arising in Lie theory. The strongest evidence for the existence of such connections comes from the study of finite Weyl groups, when they are explicitly known. Proofs of the standard conjectures together with these equivalences in general would provide, for instance, a detailed understanding of many parts of Lie representation theory that are apparently “controlled” by the associated Weyl group. More generally, the standard conjectures for the Coxeter group representation theories provide a prototype for formulating similar conjectures that seem likely to hold in a variety of important characteristic zero representation theories associated to root systems more generally.

2. Representation categories from polyhedral cones

Remarkably, representation categories qualitatively very similar to the Lie-type ones associated to Coxeter groups are also naturally associated to (possibly non-rational) fans of polyhedral cones in Euclidean spaces, and the study of analogies between these situations has been very fruitful. The standard conjectures for the categories associated to fans have interesting applications. For instance, the conjectured Koszul duality of the representation theory from a cone with the one from its dual cone is a beautiful deepening of the well known fact that the face lattices of these cones are opposite posets, and the conjectures on principal series modules have applications to the combinatorial study of simplicial and polyhedral complexes (e.g. to the study of the number of faces in each dimension of polytopes). There is a close analogy between parts of these representation theories and parts of the theory of toric varieties associated to rational fans, and it is unknown at present if there is a more direct connection.

3. Algebraic and finite groups of Lie type

Classically, Lie theory originated from the study of Lie groups—i.e., groups with topological and geometric structure. The compact Lie groups were classified and placed into families. It was ultimately noticed, however, that many of the constructions of these families of groups could be imitated over other fields of definition, including fields of positive characteristic. More significantly, the resulting groups turned out to be of more than passing interest; when the field of definition was taken to be finite, the resulting groups were either simple groups, or groups obtained from simple groups in fairly straightforward ways. One of the triumphs of modern group theory has been to show that, essentially, the simple groups resulting from Lie theory account for “the bulk” of the finite simple groups. In particular, all non-Abelian simple groups, with the exception of the alternating groups and a handful of so-called sporadic groups, arise in this way. These finite groups of Lie type can be uniformly regarded as arising as fixed points of automorphisms of algebraic groups, i.e., the groups analogous to Lie groups, but defined over algebraically closed fields of positive characteristic. The algebraic groups have geometric structure that in some cases enable one to study them by employing techniques from the classical theory of Lie groups. Due to their close relationship with the finite Lie type groups, the study of these groups has been of some interest in mathematics. For example, the study of the representation theory of the finite groups of Lie type, hence of most non-abelian simple groups, has relied heavily on various aspects of the corresponding algebraic groups. For example, l-adic cohomology on certain homogenous varieties associated to the algebraic groups has proven crucial to the ordinary and cross-characteristic representations, and the rational representation theory of the algebraic groups plays a controlling role in the defining characteristic representations of finite Lie type groups. In light of their importance as indicated above, the algebra group at Notre Dame in part studies the rational representation theory of algebraic groups.

Another line of research considers the classical groups over various coefficients and investigates their structure, generators, and relations, and their isomorphism theory. In these studies, the properties of quadratic forms and related algebras, e.g., the Clifford algebra, often play a very informative role.

Partial Differential Equations

Partial differential equations is a many-faceted subject. Our understanding of the fundamental processes of the natural world is based to a large extent on partial differential equations. Examples are the vibrations of solids, the flow of fluids, the diffusion of chemicals, the spread of heat, the interactions of photons and electrons, and the radiation of electromagnetic waves. Today partial differential equations have developed into a vast subject that interacts with many other branches of mathematics such as complex analysis, differential geometry, harmonic analysis, probability, and mathematical physics.

The Laplace equation and its solutions, the harmonic functions, form a link between partial differential equations and complex analysis, since analytic functions are the solutions to the Cauchy-Riemann equations. Boundary behavior of analytic functions on a domain is studied through the Neumann problem, which is a boundary value problem for an elliptic (Laplace like) operator. Furthermore, nonelliptic equations appear as natural objects in the study of manifolds that are boundaries of domains. These equations are similar to the degenerate elliptic equations arising in sub-Riemannian geometry and diffusion processes. Solvability and regularity of solutions to such equations form an active direction of research. The methods involved include subelliptic estimates and microlocal analysis.

Another direction of research is devoted to nonlinear elliptic partial differential equations with emphasis on second order equations. Differential geometry provides a rich source of such equations. Examples are the minimal surface equation and the Monge-Ampere equation. One important property studied by researchers in this field is the regularity of solutions, in particular the impact of regularity of coefficients and boundary values on that of solutions. An active area is the study of properties of geometric objects associated to solutions, e.g., level sets of solutions. Studies are focused on the geometric structure of these sets and methods are from geometric measure theory.

Yet another direction involves the study of nonlinear evolution equations arising in
mathematical physics such as the Euler equations of hydrodynamics or various infinite dimensional analogues of completely integrable Hamiltonian systems like the Korteweg-de Vries equation. A large amount of work is devoted to the study of the corresponding Cauchy problem for such equations. Recent developments in the area involve the use of harmonic analysis techniques to establish existence and uniqueness of solutions under low regularity initial data.

In fact, there is a very close connection between partial differential equations and harmonic analysis. Starting with Fourier series and the heat equation and continuing with fundamental solutions, the construction of inverses to elliptic equations and pseudodifferential equations, the solution to wave equations and Fourier integral operators, to spectral analysis, and asymptotic techniques methods. Harmonic analysis techniques form a major part of the modern theory of linear and nonlinear Partial Differential Equations.

The research of the partial differential equations group also includes the study of free boundary problems, reaction-diffusion equations, variational inequalities, homogenization problems, and other equations arising from industrial applications.

**Logic**

The research in mathematical logic at Notre Dame is mainly in two broad areas: computability theory and model theory. Computability theory concerns computability and complexity, often measured by Turing degree. A set is computable if there is a program for computing its characteristic function on an ideal computer that never crashes. Set A is Turing reducible to set B if there is a program for computing the characteristic function of A on a computer equipped with a CD-ROM giving the characteristic function of B. Turing reducibility is a partial ordering on the set of subsets of the natural numbers, and the Turing degrees are the equivalence classes of the corresponding equivalence relation. A set is computably enumerable if it is the range of a computable function, or, equivalently, the domain of a partial computable function. The set e of all computably enumerable subsets of the natural numbers forms a lattice under the operations of union and intersection. Soare showed that the collection of “maximal” sets is a definable orbit in e. There is ongoing work on automorphisms and the relation between complexity and structural properties, definable in the lattice.

Well-known theorems may pose interesting problems in computability. This is true, in particular, for Ramsey’s theorem, on which there is recent work. There has been quite a lot of work on computability and complexity in familiar kinds of mathematical structures—groups, linear orderings, Boolean algebras, etc. Much of this work has involved connections between definability and complexity. There has also been work on complexity of models of arithmetic. The standard model, consisting of the natural numbers with addition and multiplication, is computable; i.e., the operations are computable. Tennenbaum showed that no non-standard model can be computable. A recent result says that for any non-standard model there is an isomorphic copy of strictly lower Turing degree.

The other broad area of active work is model theory, particularly classification theory and o-minimality. In recent years, methods developed in the context of stability theory have been used to analyze structures such as pseudofinite fields, pseud algebraically closed fields, difference fields, and quadratic forms over finite fields. This research has yielded applications to arithmetic number theory. Model-theorists now have a good understanding of how these dependence relations fit in a general framework. Ongoing work generalizes techniques from the geometrical stability theory of superstable theories to this broader class. This research is likely to give insight into the model-theoretic properties of bilinear forms and groups definable in structures such as those mentioned above.

The standard example of an o-minimal structure is the field of real numbers. In the early 1980s, it was noticed that many properties of semialgebraic sets (sets definable in the field of reals) can be derived from a very few axioms, essentially the axioms defining o-minimal structures. After Wilkie proved that the exponential field of real numbers is o-minimal, the subject has grown rapidly. From a model-theoretic point of view, these structures resemble strongly-minimal structures, and many tools and methods of classification theory can be adapted to o-minimal structures. This remarkable combination of tools from stability theory and methods of semialgebraic and subanalytic geometry provides elegant and surprisingly efficient applications not only in real algebraic and real analytic geometry, but also in analytic-geometric categories (e.g., groups of Lie type) over arbitrary real closed fields.

**Topology**

There is a large topology group at Notre Dame, and the research of its members covers a wide area of currently active areas. For a more detailed view of our current research one can consult the departmental Web page and its information about individual faculty members.

Basic algebraic topology is one active area of research here. Research continues on various types of homotopy theory, both stable and unstable, often from an axiomatic point of view. One area of application is to the study of Lie groups by homotopy theoretic methods. Other problems in homotopy theory under active consideration are problems that elucidate the influence of topology on differential geometry. A particular interest is in questions of which manifolds support metrics, the curvature of which is positive in various senses and of how many such metrics there are.

Controlled topology is an another area of active research. On direction concerns various aspects of rigidity, which loosely means describing the ways that a discrete group can act on Euclidean space. This problem is a rich source of inspiration and has lead to groundbreaking work on stratified spaces by many people, not just at Notre Dame. Work on various foundational issues in controlled topology leads to the study of stratified spaces.

Basic geometric topology is an area that overlaps some of the above. Work not previously mentioned includes work on how algebraic invariants of a manifold affect the homotopy type of its group of topological or differentiable symmetries. This leads to further problems in algebraic topology and in algebra. There is also research on the classification of various geometrically interesting manifolds.

Algebraic K-theory is an active area of research as well. Ongoing research investigates the link between algebra and topology that lies at the center of K-theory and much of Williams’s work uses K-theory to get at the symmetries of a manifold. Contributions have been made to the study of L-theory, the quadratic analogue of K-theory that figures prominently in applications of topology to the study of manifolds and stratified spaces.

Research in low dimensional manifolds is yet another area represented at Notre Dame. Research in gauge theory is applied
to the study of four dimensional manifolds as well as more traditional techniques applied to the algebraic topology of four manifolds, their topological classification and their differentiable classification. There is also research in three manifolds and the four manifolds they bound using gauge theory, especially the invariants based on the Sieberg-Witten equations.

Interdisciplinary Degree in Applied Mathematics
The department also offers an interdisciplinary master of science in applied mathematics (MSAM) degree program. A description of the program may be found under “Interdisciplinary Programs” near the end of the Division of Science section of this Bulletin.

Course Descriptions
The following course descriptions give the number and title of each course. Basic sequences 601–610, seminars 671–686, and reading and research courses 698–700 are offered every year. The courses numbered 512–522 and 621–666 are topics courses. Each year topics courses are offered in algebraic geometry, differential geometry, algebra, partial differential equations, complex analysis, topology, logic, and applied mathematics. The particular topics change (probably never repeating), and the instructors rotate within groups. Thus, students are exposed to a variety of topics in which various members of the faculty have interest and expertise. The list below includes the courses offered every year, plus a typical selection of topics courses. Each course listing includes:

— Course Number
— Title
— (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
— Instructor
— Course Description
— (Semester normally offered)

513. Coding Theory
(3-0-3) Migliore, Rosenthal
An introductory seminar with the ultimate goal being the recent developments in algebraic coding theory involving the interconnection between algebraic curves over finite fields and Goppa codes.

521, 522. PDE and Applied Mathematics
(3-0-3) (3-0-3) Hu
Basic estimates, fixed point theorems, and the theory of elliptic second order partial differential equations. Second semester these tools are used to study problems in applied mathematics, such as free boundary problems and variational inequalities.

597. Directed Readings
(V-V-V) Staff

600. Differentiable Manifolds
(3-0-3) Staff
This is a new graduate course that will be offered every year. The topics covered will include: differentiable manifolds, vector fields, differential forms, and tensor analysis; inverse and implicit function theorems, transversality, Sard’s theorem, Morse theory, integration on manifolds, Stokes Theorem, de Rham cohomology.

601, 602. Basic Algebra
(3-0-3) (3-0-3) Staff
Standard results in group theory and ring theory; modules, linear algebra, multilinear algebra; Galois theory; Wedderburn theory; elements of homological algebra; introduction to an advanced topic in algebra.

603, 604. Basic Real Analysis
(3-0-3) (3-0-3) Staff
Rigorous review of the calculus of several variables; measure and integration on the real line and in general measure spaces; Haar measure; Banach spaces; Fourier series.

605, 606. Basic Complex Analysis
(3-0-3) (3-0-3) Staff
Analytic functions; Cauchy’s theorem; Taylor and Laurent series; singularities, residue theory; complex manifolds; analytic continuation; conformal mappings; entire functions; meromorphic functions.

607, 608. Basic Topology
(3-0-3) (3-0-3) Staff
Topological spaces and metric spaces; the fundamental group and covering spaces; homology theory; basic theorems in algebraic topology.

609, 610. Basic Modern Logic
(3-0-3) (3-0-3) Staff
Propositional calculus and predicate logic, completeness, compactness, omitting types theorems, results on countable models; recursive and recursively enumerable sets, Turing degrees, the Friedberg-Muchnik theorem, minimal degrees; axioms of ZFC, ordinals and cardinals, constructible sets.

611. Geometric Methods for Dynamical Systems
(3-0-3) Mark Alber
This class reviews the linear and nonlinear dynamical systems, such as Duffing’s, Van der Pol’s and Lorentz equations, geometry of the phase space, symplectic structures, variational methods, nonlinear Hamiltonian systems, integrable systems, quasiperiodic motion, averaging method, discrete dynamical systems, and the logistic function.

We also cover bifurcation phenomena and transition to chaos and theory of patterns. These include Hamiltonian vector fields, normal forms, stable and unstable manifolds, structural stability, Poincare maps, Liapunov exponents, power spectra, Hopf bifurcation, Smale diffeomorphism, perturbations of nonlinear systems, the geometric structure of the perturbed phase space, chaos and nonintegrability in Hamiltonian systems, KAM theory, perturbation of homoclinic orbits, Poincare-Melnikov method; for example, Arnold diffusion, symbolic dynamics, hyperbolic sets, strange attractors, numerical route to chaos. Theory of patterns include fractals, the Julia and Mandelbrot sets, lattice-based models, pattern dynamics in physics and biology, pattern inference, pattern recognition, and metric pattern theory.

621, 622. Topics in Algebraic Geometry
(3-0-3) (3-0-3) Sommese
Topics from recent years include geometry of compact complex surfaces, complex adjunction theory, intersection theory of algebraic schemes.

647, 648. Differential Geometry
(3-0-3) Staff
This course provides an introduction to Modern Differential Geometry. Topics include: Riemannian manifolds, connections, parallel translation, geodesics, the exponential map, the torsion and curvature, Jacobi fields, first and second variation of arc length, cut loci and conjugate locus, and elementary comparison theorem.

651, 652. Topics in Algebra
(3-0-3) (3-0-3) Dyer
Basic properties of polytopes and polyhedra with an emphasis on counting the numbers of faces using techniques from commutative algebra and representation theory.
653. 654. PDE Methods in Complex Analysis
(3-0-3) (3-0-3) Shaw
Methods of solving partial differential equations in complex analysis. Central questions: solutions of Cauchy-Riemann equations in several variables, regularity of solutions up to the boundary, and solvability and estimates for tangential Cauchy-Riemann equations on the boundaries.

655. 656. Topics in Complex Analysis
(3-0-3) (3-0-3) Stanton

657. Topics in Topology
(3-0-3) Dwyer
Emphasizes homotopy theory. Dual purpose: to impart to the student a certain amount of basic information (fibre bundles, spectral sequences, cohomology operations, etc.) and to teach the student how to grapple with the existing and extensive advanced material in an inquiring but skeptical way.

658. Ends of Manifolds and Maps
(3-0-3) Connolly
The initial solutions of the question as to when a manifold is the interior of a compact manifold with boundary (by Browder-Livesay, Levine, and Siebenman); the recasting of this theory by Quinn with its far-reaching consequences.

661. Topics in Logic: Computable Structures and the Hyperarithmetical Hierarchy
(3-0-3) Knight
Results connect definability in computable structures with bounds on complexity. The results apply to familiar kinds of mathematical structures (vector spaces, orderings, Boolean algebras). The proofs involve priority constructions, arbitrarily nested, and forcing.

662. Topics in Logic—Finite Model Theory
(3-0-3) Buechler
An overview of the model theory of classes of finite structures. 0-1 laws, Fagin’s Theorem, Ehrenfeucht games and ultraproducts of finite structures. Generic structures and limits of finite structures are discussed.

665. Elements of Symplectic Geometry and Nonlinear Integrable Problems
(3-0-3) Alber
Methods of symplectic geometry; those that use interesting examples from the applications of analysis and those that serve as links between geometry and modern analysis; unexpected results in both pure and applied mathematics via the application of such methods to nonlinear Hamiltonian systems.

666. Topics in Differential Geometry
(3-0-3) Staff
This is an advanced topics course in Differential Geometry. The following topics were taught in previous years: geometry of submanifolds; minimal surfaces; manifolds of non-positive curvature; analysis on symmetric spaces; symplectic geometry; and complex differential geometry and spectral geometry.

671, 672. Seminar in Algebra
(V-0-V) (V-0-V) Staff
673, 674. Seminar in Analysis
(V-0-V) (V-0-V) Staff
675, 676. Seminar in Complex Analysis
(V-0-V) (V-0-V) Staff
677, 678. Seminar in Topology
(3-0-3) (3-0-3) Staff
681, 682. Seminar in Mathematical Logic
(V-0-V) (V-0-V) Staff
683, 684. Seminar in Number Theory
(V-0-V) (V-0-V) Staff
685, 686. Seminar in Geometry
(V-0-V) (V-0-V) Staff
The actual topics studied in courses numbered 671 through 686 will appear on the student’s transcript when possible.

Other Graduate Courses
697. Directed Readings
(V-0-V) Staff
699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident graduate students.
700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

Faculty
Algebra
KATRINA D. BARRON, Assistant Professor.
A.B., Univ. of Chicago, 1987; Ph.D., Rutgers Univ., 1996. (2001)
MATTHEW J. DYER, Associate Professor.
ALEXANDER J. HAHN, Professor. B.S., Loyola Univ., Los Angeles, 1965; M.S., Univ. of Notre Dame, 1968; Ph.D., ibid., 1970. (1972)
GEORGE McNINCH, Assistant Professor. B.S., Samford Univ., 1990; Ph.D., Univ. of Oregon, 1996. (1996)
RICHARD OTTER, Associate Professor Emeritus. A.B., Dartmouth College, 1941; Ph.D., Indiana Univ., 1946. (1947)
WARREN J. WONG, Professor. B.S., Univ. of Otago, 1954; M.S., ibid., 1955; Ph.D., Harvard Univ., 1959. (1964)

Algebraic Geometry
MARIO BORELLI, Associate Professor. B.S., Scuola Normale di Pisa, 1956; Ph.D., Indiana Univ., 1961. (1965)
CLAUDIA POLINI, Assistant Professor. B.S., Universita degli Studi di Padova, 1990; Ph.D., Rutgers Univ., 1995. (2001)
DENNIS M. SNOW, Professor. B.S., Merrimack College, 1975; M.S., Univ. of Notre Dame, 1977; Ph.D., ibid., 1979. (1982)


Applied Mathematics
MICHAELE GIKHTMAN, Assistant Professor. B.S., M.S., Kiev State Univ., 1983; Ph.D., Ukrainian Academy of Science, 1990. (1999)
BEI HU, Professor. B.S., East China Normal Univ., 1982; M.S., ibid., 1984; Ph.D., Univ. of Minnesota, 1990. (1990)
Cecil B. Mast, Associate Professor Emeritus. B.S., DePaul Univ., 1950; Ph.D., Univ. of Notre Dame, 1956. (1959)

Complex Analysis
JEFFREY DILLER, Assistant Professor. B.S., Univ. of Dayton, 1988; Ph.D., Univ. of Michigan, 1993. (1998)
WILHELM F. STOLL, Vincent J. Duncan and Annamarie Micus Duncan Professor Emeritus of Mathematics. Ph.D., Univ. of Tubingen, 1953. (1960)
PIT-MANN WONG, Professor. B.Sc., National Taiwan Univ., 1971; Ph.D., Univ. of Notre Dame, 1976. (1980)

Differential Equations
QING HAN, Assistant Professor. B.S., Beijing Univ., 1986; M.S., Courant Institute, 1991; Ph.D., ibid., 1993. (1994)

Differential Geometry
XIAOBO LIU, Associate Professor. B.S., Tsinghua Univ., P.R. China, 1987; Ph.D., Univ. of Pennsylvania, 1994. (1999)
BRIAN SMYTH, Professor. B.S., National Univ. of Ireland, 1961; M.S., ibid., 1962; Ph.D., Brown Univ., 1966. (1966)

Logic
PETER CHOLAK, John and Margaret McAndrews Associate Professor. B.A., Union College, 1984; M.A., Univ. of Wisconsin, 1988; Ph.D., ibid., 1991. (1994)
ABRAHAM GOETZ, Associate Professor Emeritus. M.S., Univ. of Wroclaw, 1949; Ph.D., ibid., 1957. (1964)
JULIA F. KNIGHT, Charles L. Huisking Professor of Mathematics. B.A., Utah State Univ., 1964; Ph.D., Univ. of California, Berkeley, 1972. (1977)
SERGEI STARCHENKO, Associate Professor. M.S., Univ. of Novosibirsk, 1983; Ph.D., ibid., 1987. (1997)
VLADETA VUCKOVIC, Associate Professor Emeritus. M.S., Univ. of Belgrade, 1949; Ph.D., ibid., 1953. (1963)

Topology
FRANCIS X. CONNOLLY, Professor. B.S., Fordham Univ., 1961; M.S., Univ. of Rochester, 1963; Ph.D., ibid., 1965. (1971)
JOHN E. DERWENT, Associate Professor. B.S., Univ. of Notre Dame, 1955; Ph.D., ibid., 1960. (1960)
STEPHAN A. STOLZ, Rev. John A. Zahlm, C.S.C., Professor of Mathematics. B.S., Univ. of Bielefeld, 1975; M.S., Univ. of Bonn, 1979; Ph.D., Univ. of Mainz, 1984. (1988)
E. BRUCE WILLIAMS, Professor. B.S., Massachusetts Institute of Technology, 1967; Ph.D., ibid., 1972. (1975)

Physics
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The Program of Studies
The graduate program in physics is a combination of course work and research designed to prepare the student for a career in university, industrial or governmental research or in college or university teaching. There is a sequence of basic courses in the fundamental areas of physics. In addition, the student will take advanced courses and seminars in specialized areas. The research work of the student is emphasized and he or she is required to join in a physics research program of the department within the first year.

The graduate program is primarily a doctoral program, leading to the degree of doctor of philosophy, and the department ordinarily will not accept students who
intend to complete only the master’s degree. However, two programs leading to the degree of master of science are available, one with thesis research and one without thesis research.

The master of science research program requires 24 credit hours of course work and six credit hours for an acceptable thesis based upon research; the nonresearch program requires 30 credit hours of approved course work. Each program of course work is chosen in consultation with a faculty adviser.

Interdisciplinary programs between physics and chemistry or biology are also available (see the MBP program).

All incoming graduate students are given interviews to determine their preparation for and to assist in planning their course work. Courses 503, 505, 506, 507, 508, 510, 601, 602, 603, and three from among 605, 607, 609, 613, and 617 (or their equivalents) are required for admission to Ph.D. candidacy. In addition, students must pass a qualifying examination on undergraduate physics, which is given early in the fall and spring terms, prior to being invited to take the candidacy examination. The candidacy examination is normally taken at the end of the fourth or beginning of the fifth semester. There is no foreign language required for a Ph.D. in physics. Students are required to begin research in their second semester.

The major areas of research are as follows:

**Astrophysics, Cosmology, and Astronomy**

The Notre Dame program in astrophysics, cosmology, and astronomy combines observational and theoretical tools to investigate the origin and evolution of matter in the universe. Active areas of research run the gamut from the first instants of cosmic expansion, through the birth and development of the solar system, to the present complex interactions of stars and gas in galaxies.

**Theoretical Astrophysics**

Cosmology

We investigate the origin of the physical universe, with an eye to understanding how events early in the big bang may have left observable relics today. An example of such an event is cosmological inflation, the extremely rapid expansion of the very early universe driven by vacuum energy. We study models of inflation and how these models are tested by observations of fluctuations in the cosmic microwave background radiation. We also study the formation of inhomogeneities in the early universe as it passes through various phase transitions such as the electroweak transition and the QCD transition. By quantifying how such inhomogeneities might have affected the later formation of light elements during the epoch of primordial nucleosynthesis, we can constrain the physical conditions occurring during the big bang. We also study the possible imprint of cosmic phase transitions directly on the microwave background.

Moving from the early to the adolescent universe, we study the formation and evolution of galaxies. We are developing detailed simulations that describe how stars form and re-emit heated enriched gas while the galaxy collapses into a halo and disk. Such studies probe the galaxy formation process and can be used to derive more reliable estimates of the age of the universe. We also are investigating the nature and origin of the dark matter that makes up most of the mass of the universe. We have ongoing studies of neutrino dark matter, as well as the formation and evolution of stellar remnants, which may provide the source for the microlensing objects observed by the MACHO collaboration (see below) and other groups.

**Numerical Relativity**

We investigate Einstein’s general relativity through computer simulations of the full (3+1) dimensional relativistic equations. Specifically, we model the merger of a binary pair of neutron stars, the system that should provide the strongest signal for gravity wave detectors soon to come on line. These highly energetic merger events may also provide a means to explain the occurrence of cosmological gamma ray bursts.

**Nucleosynthesis in Stellar Explosions and Stellar Evolution**

We study the evolution of a massive star as its core collapses to form a type II supernova. Just before collapse the critical mass of the core is determined by numerous weak nuclear decays that decrease the electron pressure and remove energy in the form of neutrinos. We calculate these rates. As the collapse ensues, we study the effects of changes in the nuclear equation of state, such as a transition to quark-gluon plasma.

Some changes affect the evolution of the explosion and the neutrino signal. This probes physical properties of matter at high temperature and density. After the collapse, we study the cooling and neutrino emission from the proto-neutron star. These neutrinos provide important extra energy to the explosion and an environment in which heavy elements can be synthesized.

We also study hydrodynamic models for the evolution of nova outbursts and X-ray bursters with extensive nuclear reaction networks.

**Observational Astronomy and Astrophysics**

**Cosmic Rays**

A recently completed extensive air shower (EAS) array allows the experimental study of cosmic rays. The particle energies studied are from 30 to 300 GeV with a single muon trigger and ultra high energies(UHE) from 100 TeV (100 Trillion electron Volts) to a 100,000 TeV with a shower trigger. The spectrum and composition of cosmic rays at UHE is an area of intense interest. The unique use of proportional wire chamber detectors together with absorbers allows the measurement of the angle of each secondary track and its identification as a muon or electron, thus distinguishing the shower as gamma (muon poor) or hadronic. The tracking chambers provide unparalleled angular resolution; together with the muon identification, they allow a sensitive search for stellar point sources of UHE gamma rays. Extrapolating muon trajectories backward reveals their height-of-origin; this height is sensitive to the nature of the cosmic ray primary and thus enables a measurement of the atomic composition of primary cosmic rays. The single muon trigger allows a high statistics study of cosmic ray anisotropies (Compton-Getting effect) and space and angle correlations with gamma ray bursts detected by satellite experiments.

**Supernovae and Cosmology**

The history and content of the universe is one of the most pressing questions in astrophysics. We are part of a team using supernovae to probe the expansion history of the universe and we have recently found evidence of a new form of energy that is causing the expansion to accelerate. Some types of supernovae make precise distance indicators, and their brightness means they can be seen at early epochs when the expansion was different than its current rate. We are also studying the variations in
properties of nearby supernovae to understand their limitations as cosmological probes.

Solar System Formation and the Physical Structure of Comets

The ongoing formation of stars and planets throughout the universe always begins with condensation and accretion of ices and small dust particles in the very coldest regions of interstellar space. In our research involving the origin of these young stellar systems, we use the infrared spectra of protoplanetary disks around T Tauri stars to examine the formation processes and an abundance of ices such as CO, XCN, and H$_2$O. These T Tauri protostars are important because they represent a poorly understood early stage of disk and planetary formation. Our studies of the abundance of these ices provide important information concerning the amount of thermal and chemical processing of icy grains in circumstellar disks that occurs during the early phase of disk evolution and provides clues as to how comets formed and perhaps initiate planet formation. Our studies of the abundance of these ices provide important information concerning the amount of thermal and chemical processing of icy grains in circumstellar disks that occurs during the early phase of disk evolution and provides clues as to how comets formed and perhaps initiate planet formation. How comets are built in young planetary systems is also poorly understood. Are comets loose "rubble piles" of planetesimals or are comets uniform chunks of ices and dirt like very large "dirty snowballs"? In our studies of comets, we have used the high resolution imaging capabilities of the Hubble Space Telescope to investigate the structure of the "cores" of tidally fragmented comet Shoemaker-Levy 9. Understanding the structure of these comets will provide a better understanding of how comets formed and of the initial accretion conditions that were present in the early solar nebula.

The Search for Gravitational Microlensing

We are actively participating in the MACHO Project survey of the Large Magellanic Cloud. This survey is one of the first that can detect "dark matter" in the form of massive compact objects (otherwise invisible) via "gravitational microlensing," the general relativistic amplification of background starlight. The analysis of this data set of more than eight million stellar light curves has evidenced many microlensing events with an average timescale of about 2.5 months. This single data set comprises more observations of individual stars than have been made during the entire history of astronomy prior to this survey. The simplest interpretation of these results is that a previously unknown population of objects that comprise about 50 percent of the total mass of the galactic halo causes the microlensing. The typical mass of these objects is roughly half a solar mass, suggesting that they may be predominantly white dwarfs. These results are the first positive detection of dark matter in our galaxy and provide important constraints on cosmology (see above) as well as new insight into galactic structure and dynamics.

We are also using this gravitational microlensing technique to search for planets orbiting stars located toward the galactic center.

Atomic Physics

Atomic physics research at Notre Dame involves the experimental and theoretical study of atomic structure as it relates to the understanding of electroweak, quantum electrodynamics (QED), and relativistic many-body interactions. Experimental measurements in high Z ionic systems are motivated by the desire to test QED corrections in atomic theory. Precision measurements of forbidden transition strengths, hyperfine structures, and atomic lifetimes test many-body calculations important to the interpretation of parity nonconservation (PNC) in atoms and atomic structure in general. The similarity of our interests strongly enhances the interaction between the theoretical and experimental atomic physics groups at Notre Dame.

Lifetimes in alkali-like systems

This research program focuses on measurements of excited state lifetimes in neutral alkali and alkali-like charged systems. Precision measurements of atomic lifetimes are important to the analysis of data from many fields and provide fundamental atomic structure information. Scientists in astrophysics, geophysics, and plasma fusion depend on lifetime measurements as means for calibrating relative values of oscillator strengths. From a theoretical point of view, alkali-like atoms provide the simplest open shell systems for detailed comparisons between experiment and theory. In addition, the interpretation of parity nonconservation experiments requires accurate knowledge of the atomic structure including radial matrix elements. Through initial experiments in cesium, we have developed an apparatus for measuring atomic lifetimes by laser excitation of a fast atomic beam. This technique is extremely versatile and can be applied to a wide variety of atomic systems. The experiments are carried out at the Atomic Physics Accelerator Laboratory (APAL) at Notre Dame. The delayed photon coincidence technique is also being investigated as an alternative approach for measuring atomic lifetimes.

Measurements of Forbidden Transition Amplitudes

The occurrence of PNC in atoms provides a mechanism for testing the Standard Model of electroweak interactions at energies inaccessible to high-energy accelerators. The detailed interpretation of PNC experiments requires accurate knowledge of atomic structure. This program focuses on measurements of atomic transition amplitudes that are important to the interpretation of PNC experiments. Measurements of the magnetic dipole and electric field induced amplitudes in the cesium 6s $^2$S$_{1/2}$-7s $^2$S$_{1/2}$ transition provide direct calibrations of PNC experiments. The measurement techniques developed for cesium will be extended to other atoms of interest for testing the Standard Model and atomic theory.

Forbidden Transitions in Helium

Following our theoretical results, which show a dependence of magnetic dipole transitions (M1) on the negative energy states of the relativistic atomic system, we are attempting excitation of the 2s$^2$S-3s$^2$S transition at 427 nm. In addition, the two-photon transition rate between the same two states will be measured. These measurements and other forbidden transition rate measurements provide sensitive tests of many-electron relativistic atomic theory, such as the work of the theoretical group at Notre Dame.
Buckyball collisions with multicharged heavy ions
A “buckyball” molecule is made up of 60 carbon atoms in a spherical shell, with the structure of a “soccer ball,” and is the most stable molecule known. When colliding with multicharged heavy ions, many electrons are transferred from target to projectile, and other electrons are scattered away. We continue a collaborative work with a group in Lyon, France to study the dynamic processes involved. Of particular interest is the stability of the carbon-cage once it is ionized—for example up to five times ionized C_{60} can be stable with sufficiently low internal energy. The stability of these associated molecules depends sensitively on the internal energy, which is typically supplied in the multicharged ion collision. These experiments, which detect all fragments and electrons in each collision, can help develop and test theories of ion-molecule interactions. The collisions are also used to search for photon decays from the fragments of the collisions.

Hyperfine Structure Measurements
Studies of hyperfine structures in neutral and ionized atoms are made in a Doppler-free geometry of laser induced fluorescence studies of atoms accelerated in the APAL facility. Initial studies in the rare gas isoelectronic sequence include measurements in the singly charged alkali atoms where configuration interaction in low-lying metastable levels is considerable. Studies are also beginning in several rare-earth systems as part of an investigation of PNC in atoms.

Atomic Structure of Highly Charged Ions
Spectroscopic measurements of fine structure transition energies in highly charged ions are performed to test our understanding of relativistic atomic structures in few-body systems. Experiments are performed at heavy-ion facilities: the Tandem Laboratory at Notre Dame, the ATLAS facility at Argonne National Laboratory, and the GSI facility in Germany. Our recent measurements of n=2 state energies in Ar^{16+} using beam-foil spectroscopy have provided sensitivity to high-order QED terms in helium-like ions which have not yet been calculated. Experiments are under way for precise fine structure measurements in heavier He-like and Li-like ions.

Lifetimes in Highly Charged Ions
Spectroscopic measurements of excited state lifetimes provide tests of theoretical atomic transition probabilities. Accelerator-based spectroscopy permits measurements of both allowed and “forbidden” transition rates in highly charged ions. Our recent study of highly charged krypton ions has yielded lifetimes for allowed and forbidden transitions in Kr^{32+}{\text{-33+}} ions ranging in value from 10 ps to three ns. In an experiment on the He-like P^{33+} ion, we have measured the effect of the hyperfine interaction on the fine structure state lifetimes.

**Rydberg Spectroscopy of Few Electron Ions**

The atomic structures of high angular momentum Rydberg states in highly charged ions are sensitive to long-range electron-ion interactions for these highly excited states that are not seen in normal atomic structures. Our spectroscopic measurements of Be-like Si^{10+}, S^{12+}, and Cl^{13+} ions have provided Rydberg state structures up to principal quantum numbers n>10. A new measurement of the Be-like N^{14+} Rydberg structures has been performed using laser-stimulated recombination spectroscopy at the heavy-ion storage ring (TSR) in Heidelberg, Germany. Extensions of these measurements to more highly excited states in heavier ions are planned.

**Theoretical Atomic Physics**

Relativistic and correlation effects in heavy atoms are studied using various methods, including relativistic Hartree-Fock theory, relativistic many-body perturbation theory, configuration interaction methods, and iterative all-order methods. Applications are made to predict accurate energies, transition rates, and hyperfine constants for low-lying levels of atoms and ions with one, two, and three valence electrons. Specialties of the group include atomic structure calculations done in support of experiments on violations of fundamental symmetries in atoms. Radiative corrections to energy levels of simple systems, including higher-order QED corrections in neutral helium, are also among current research topics.

**Biological Physics/Biophysics**

Biological physics applies the quantitative methodology of physics to study complex biological processes. Research in the Department of Physics includes experiment, theory and computer simulation. We also collaborate and share facilities with the Department of Biological Sciences. Students with an interest in biological physics are eligible for the Molecular Biosciences Program, which provides additional fellowship support and broader course choices. We aim to design clean, simple, quantitative experiments that distinguish individual physical mechanisms. Examples of current research include cell sorting and neural networks.

**Cell Sorting**

Cell-type dependent surface adhesion molecules (e.g., cadherins) participate in many cellular processes from gastrulation to cancer metastasis. The contact energy between cells depends on these molecules, and because cells diffuse, mixtures of different cell types rearrange to minimize their boundary energies. This reorganization is one of the mechanisms by which cells migrate long distances during embryonic development and wound healing.

The interaction between two cells during sorting is determined only by their surface adhesion and membrane fluctuations. We use the Potts model computer simulation to analyze simple, random cell aggregates. Over short times, cells behave almost as ideal molecules, performing biased random walks in a rough energy landscape.

**Neural Networks**

Despite recent advances in the application of electronic neural networks, we understand little about the way the brain actually performs computations. Certain areas of the brain have well-defined specialized functions, others seem able to perform several different types of computation in overlapping regions. How does this segregation of information occur? Does the connection pattern allow different numbers of neurons to perform the same computation?

The dynamics of fractally coupled map lattices (a simplified model of neural networks) have different spatial patterns from those of either locally or globally connected lattices, suggesting that fractal connectivity allows the brain to use the same region of association cortex for several different tasks. In collaboration with the biological sciences department, we distinguish, experimentally, essential characteristics from accidental. In amphibians, the number of neurons in the brain varies inversely with the polyploid number. During development the brain compensates for differences in the number of neurons, possibly by increasing the number of synapses per neuron. Measuring the three-d connection patterns in Xenopus has shown that the neurons of the regions in the frog’s brain that integrate multiple sensory inputs fall into classes of differing shapes and
connectivity described by fractal scaling exponents as predicted by simulations.

Understanding the dynamics of lung inflation is an important problem with applications in respiratory physiology. Lungs are branching structures in which the dynamics of air motion is rather complex and often irregular. We develop statistical mechanics models to describe the closure and opening of airways and the respiratory patterns associated with these processes. Also, ongoing research addresses the breathing patterns of preterm infants, the goal being to develop theoretical models to capture the irregularity of the infant breathing cycle.

**Facilities**

The Department of Physics has sterile cell culture capability, video microscopy, and neuron tracing equipment. Shared facilities with the Department of Biological Sciences include a complete animal care facility, Fluorescent Scanning Confocal Microscopy, Electron Microscopy, general histology, intracellular recording, and voltage sensitive dye imaging.

**Condensed Matter Physics**

Condensed matter research at Notre Dame involves the experimental and theoretical study of novel materials systems. These serve both as models for understanding fundamental condensed matter physics and as prototype materials for technical applications. Close collaborations exist between the experimental and theoretical groups in this effort. Work involves the preparation and analysis of these systems both on and off campus, and includes close collaborations with faculty in other departments such as electrical engineering and chemical engineering at Notre Dame. An element characteristic of experimental condensed matter research is the ability of a student to personally conduct his or her own experiment through all stages with the help of an adviser: including sample preparation, experiment, and analysis. Specific areas of interest are discussed below:

**Fluid Dynamics and Foams**

In collaboration with researchers at Tohoku University, Sendai, Japan, strong turbulence and magneto-hydrodynamic turbulence are investigated in liquid Hg. Also, the structure and evolution of liquid and solid foams are studied with magnetic resonance imaging as part of a broad effort to understand cellular materials.

**Magnetism**

Magnetic materials are examined by a variety of techniques to understand the fundamental nature of many-body magnetism and to investigate the possibility of applications. Examples include colossal magnetoresistance compounds that change resistance by orders of magnitude when placed in a magnetic field, dilute magnetic semiconductors, and geometrically frustrated antiferromagnets.

**Mesoscopic Physics**

Few-atom clusters, fullerenes, and other exotic systems probe the basic mechanisms of systems of few atoms. Single-electron charging effects and related phenomena are explored.

**Semiconductor Physics**

Thin-film II-VI semiconductor samples are prepared by molecular beam epitaxy, including heterostructures and quantum wells. These, as well as bulk samples, are studied by a variety of experimental techniques including laser spectroscopy, X-ray and neutron scattering, and electron transport. Work on heterostructures includes the development of blue-light semiconducting lasers. Theoretical efforts involve the analysis of strain distributions and stability of heterostructures and alloys. In addition, Monte Carlo simulations are used to investigate the dynamics and morphology of surface growth by MBE, phase diagrams of semiconductor alloy systems, and the interplay between elastic interactions and ordering/phase separation of lattice-mismatched alloys.

**Structural Studies**

X-ray absorption fine structure (XAFS) and X-ray scattering are used to study the atomic-scale structure of semiconductors, and through collaborations, the structure of metalloproteins, catalysts, and environmentally-relevant systems. Because of the unique advantages of synchrotron radiation, these experiments are conducted at the MRCAT beamlines at the Advanced Photon Source at Argonne National Laboratory, where Notre Dame is a major participant.

**Superconductivity**

High-temperature superconductors are studied from the perspective of microwave absorption and other techniques with a view to probing fundamental mechanisms. These include investigations of the response of high-temperature superconductor thin-film systems to ultra-short duration, far-infrared light to evaluate potential applications for the intrinsic electronic properties of these novel materials. Theoretical work includes studies of two-dimensional antiferromagnets, their relationship to high temperature superconductors, and the degree to which this potential relationship may be tested by experiments such as photoemission and tunneling. The tools employed in this area include finite-temperature field theory, with functional integrals and Feynman diagrams providing systematic approximation methods.

**Additional theoretical research**

In addition to the research discussed above, theoretical condensed matter physics research includes the following areas: The basic properties of non-equilibrium systems are investigated with application to surface and growth phenomena. Tools include continuum stochastic equations, renormalization group, and numerical simulation. Theories of fluids and liquid-solid phase transitions and classical density functional theory are also being pursued.

**High Energy Physics**

Notre Dame has a substantial presence in both experimental and theoretical high-energy physics, as detailed below. It should be noted that the research of the theoretical and experimental group members shows parallel interests in several areas, such as heavy quark and Higgs physics and supersymmetry. This leads to a more cohesive interaction between theory and experiment at Notre Dame. In addition, we have an extensive effort in education and outreach through QuarkNet. QuarkNet is a collaboration of particle physics research groups located at 60 U.S. universities and laboratories. This program partners students and teachers with experiments at the world’s most powerful accelerators, located at CERN in Switzerland and Fermilab in Illinois.

**Experimental High Energy Physics**

Experimental research in high energy physics at Notre Dame centers on a number of projects. Notre Dame is involved in the study of weak vector bosons and heavy quarks at the Fermilab Tevatron collider, a search for exotic mesons at Brookhaven, the search for the Higgs boson and supersymmetry at the CERN LHC and the study
of CP violation in B meson decay at Stanford Linear Accelerator Center (SLAC). Recently completed projects have included the study of charm photoproduction at Fermilab, the search for quark gluon plasma at the Fermilab Tevatron collider, and studies of grand unified theories and neutrino physics in deep underground detectors. Modern high-energy physics detector development is also an important part of the program.

The study of weak vector bosons, heavy quarks, and QCD phenomena at the Fermilab Tevatron collider is carried out with the DØ detector. A major upgrade to the detector has recently been completed. The upgrade improves the detector’s ability to study top and beauty quarks by providing magnetic tracking in addition to the detector’s outstanding calorimetry. The DØ group was a co-discoverer of the top quark and will now take advantage of the Tevatron’s unique capabilities as the world’s current sole source of top quarks. The collider is also one of the few facilities in which the W boson, responsible for the well-known charged weak interactions, can be produced and studied.

The study of electroweak symmetry breakings and a search for new phenomena is in preparation, utilizing the Large Hadron Collider (LHC) under construction at CERN, near Geneva, Switzerland. A consortium of U.S. and foreign physicists is building two large multipurpose detectors, and Notre Dame is involved with one of these called CMS. CMS is specialized to study the massive Higgs boson, an essential part of the standard model responsible for mass generation, and the spectra of supersymmetric particles that may populate the mass region above the top quark. Notre Dame is an active member of the hadronic calorimetry subgroup of CMS.

The study of CP violation in B meson decay is being done with the BaBar detector at the PEP II storage ring currently under construction at SLAC. Our understanding of CP violation, which has to date been only observed in the decay of the neutral K meson, implies that CP violating effects should be found in the decay of B mesons, and the effect should be large. CP violation is a subtle effect in which nature distinguishes between matter and antimatter and such an effect is needed to understand the prevalence of matter over antimatter in our world. The studies demand precision measurements of very large samples of B mesons. Notre Dame is involved in the calorimetry and tracking reconstruction for BaBar.

Detector development at Notre Dame includes the study of the use of optical fibers as particle detectors. Several of our experiments have used optical fiber technology for tracking or for calorimetry. The need to read out these devices accurately and quickly has led to a number of advances in fast scintillators and in visible-light photon detectors. The Notre Dame group has pioneered developments in these detector technologies, and was proposer and coleader of the construction effort for the Central Fiber Tracker (CFT) for the DØ experiment at Fermilab.

**Education and Outreach**

QuarkNet is a federally funded National program partnering high school teachers with particle physicists working on high-energy colliding beam experiments at Fermilab and at CERN. Notre Dame is directly involved in the management of the National QuarkNet Program and also operates the Notre Dame QuarkNet Center located adjacent to the campus where high school teachers and students can participate “hands-on” in construction of state-of-the-art particle physics detectors.

**Theoretical High Energy Physics**

Theoretical high energy physics at the University of Notre Dame runs the gamut from the very phenomenological to the very abstract. The research areas of particular interest include violations of discrete symmetries, rare decays, particle-antiparticle oscillations, quantum field theoretic problems, supersymmetry and grand unification, astrophysics and cosmology, symmetry groups and algebras, and topological questions. While the methods used and the systems studied vary considerably, the goals in the end are similar: explaining what really makes our universe tick and understanding at a deep level the theories that allow such an explanation.

A violation of time reversal (T) invariance has been observed in the decays of neutral kaons. Its role as a fundamental element of nature’s grand design has been fully appreciated, yet we lack a real theoretical understanding of it—not surprisingly, since T violation is connected with central mysteries of the Standard Model, namely the problem of mass generation and family replication. One predicts with considerable confidence that the decays of beauty mesons will exhibit truly large T asymmetries. The phenomenology of beauty and charm hadrons is extended with the goal of determining the size of the fundamental weak-interaction parameters and arriving at predictions for T asymmetries with as much quantitative precision as possible. This involves extracting the fundamental quark dynamics from the observable hadron dynamics. Novel field-theoretic methods based on heavy-quark expansions have been developed for this task; they are continually refined.

One broad area of research at Notre Dame is supersymmetry (SUSY), a symmetry relating bosons and fermions that could explain many puzzles, such as the origin of fundamental interactions or the longevity of our universe. While many compelling arguments suggest that nature is, at some level, supersymmetric, there are as yet no complete and convincing supersymmetric standard models. Different assumptions about the mechanism by which SUSY is broken lead to different ways of meeting present experimental constraints and generate rich phenomenologies for future experiments. Some applications of SUSY under study at Notre Dame are unified theories of the strong and electroweak forces; flavor symmetries that can explain the observed quark and lepton mass hierarchies and predict new effects such as rare decays and neutrino oscillations, and novel signatures in Higgs boson interactions. Testing the various theories, either directly at high-energy colliders or indirectly using rare phenomena and precise predictions of low-energy parameters, is of great interest to theorists and experimentalists alike.

Another active area of study is the overlap of particle physics with astrophysics and cosmology. When new theories are formulated to explain experimental observations or the origin of existing theories, inevitably new and exotic particles and interactions are predicted; these can radically change the early evolution of the universe, the behavior of stellar objects, or even the vacuum itself. Astrophysical observations can, in turn, dramatically constrain such theories, often bounding their parameters far more stringently than terrestrial experiments. Properties of massive neutrinos, of supersymmetric particles, and of more exotic relics such as quintessence, which may explain the mysterious dark
energy observed by astronomers, are some examples of current research.

On a more mathematical, abstract level, research is in progress on various aspects of symmetries and their applications. The role of symmetries in physics cannot be overstated; indeed, all of high-energy physics is founded on symmetry principles of various sorts. Two examples, CP and supersymmetry, were mentioned above. Another area of active study is infinite-dimensional Lie algebras, in particular Kac-Moody, Virasoro, and W-algebras applicable to conformal field theories and integrable systems, and the algebras corresponding to the group of maps from spheres and tori to compact simple Lie groups. The cohomology of these groups and the Lie algebras, and their connection with the problem of anomalies in current algebras, are being examined. Relativity groups (Galilean and Poincare) in < 4 dimensions and their projective unitary representations and physical applications is another area of interest. Finally, the topology of a space, and not just its symmetry properties, determines its physics. One topic of current research is the role that topology plays in determining the relationship between a particle’s spin and the quantum statistics it obeys.

**Nuclear Physics**

The nucleus is a unique many-body quantum system of fermions (neutrons and protons) interacting under the strong, electromagnetic, and weak interactions. It is therefore an excellent laboratory for the study of the fundamental forces as exhibited in various nuclear properties. Research in nuclear physics at Notre Dame is built around a broad program in low energy experimental nuclear science that overlaps with the highest-priority scientific objectives in modern nuclear physics. Work is typically carried out at the accelerator facilities in our own laboratory as well as a variety of accelerators in locations throughout the world. Our main research areas include Radioactive Ion Beams, Nuclear Astrophysics, Nuclear Structure, Fundamental symmetries, and Weak Interactions.

**Nuclear Structure Laboratory**

The Nuclear Structure Laboratory of the University of Notre Dame is one of only three medium-scale accelerator laboratories in the United States funded by the National Science Foundation. At present, we maintain two accelerators in our laboratory—an “FN-Tandem” machine capable of achieving 10 MV terminal potential, and a smaller third MV accelerator that can produce the very high particle currents necessary for the study of nuclear astrophysics phenomena. A third one MV accelerator is presently being installed for the astrophysics program.

The FN accelerator has two types of ion sources: a SNICS and an HIS. Some unique capabilities at Notre Dame include the Blue Giant detector consisting of 32 ion-implanted Si detectors that can cover a large angular range in one of the general purpose scattering chambers, and the Twinsol Facility of dual superconducting magnetic spectrometer for the production of radioactive ion beams. Twinsol was the first U.S. low-energy radioactive ion beam facility. Others include, a moving tape system with a superconducting solenoid for weak interactions work, an array of Ge-detectors (3-55% and 2-Clover type) for g-spectroscopy measurements, and a state-of-the-art RDM device for lifetime measurements.

Interdisciplinary programs that utilize high-current particle beams to study phenomena of interest in atomic and condensed-matter physics, and in the engineering of solid-state devices, are also being pursued. A brief summary of the most important research work of our faculty and staff is given below.

**Radioactive Nuclear Beams**

One of our major research programs is directed toward the study of reactions induced by short-lived radioactive nuclear beams. This is an area that was pioneered in the Nuclear Structure Laboratory at Notre Dame, where the world’s first usable beams of radioactive nuclei at non-relativistic energies were developed in 1987. The research encompasses studies of reactions induced by short-lived nuclei that are important for the understanding of astrophysical and cosmological processes, as well as investigations of the structure of exotic nuclear species at the limits of nuclear stability. Some of the future initiatives include:

1. The development of Twinsol as a momentum separator to study explosive stellar hydrogen and helium burning.
2. Sub-Coulomb dissociation of 8B, which is important both as it relates to the problem of “missing” solar neutrinos and because 8B is a “proton-dripline” nucleus that has been proposed to have a quite exotic “proton-halo” structure.
3. The development of a new rabbit system for the study of the (bn)correlations in 8B b decay in searching for G-parity violation resulting from u and d quark mass differences.

**Nuclear Astrophysics**

The research activities of the nuclear astrophysics group are focused on measurements of reaction and decay processes that are important for the understanding of hydrogen, helium, and carbon burning phases during stellar evolution, and in explosive stellar events such as novae, supernovae, and X-ray bursts. In addition to the experimental work, large network simulations of nucleosynthesis in these stable-burning and explosive scenarios are carried out. A few examples of the studies being presently carried out are:

1. New experimental techniques and methods have been developed to successfully measure the 12C(a,g)16O reaction rate that is crucial for understanding the fate of late stars and the ignition of supernovae. These techniques are now applied for determining the stellar neutron sources for the s-process in the Red Giant and Asymptotic Giant phase of stellar evolution.
2. To simulate the origin of lead in our universe, s-process measurements on Ni and Pb isotopes have been initiated at the new n-TOF facility at CERN/Geneva. The results will be implemented into nucleosynthesis simulations of stellar evolution.
3. The 20Ne(p, γ) and 20Ne(p, g) reactions determine the origin and fate of neon in hydrogen-shell burning of deeply convective massive stars. The observed elemental abundances at the surface of these stars are inconsistent with the accepted rates for this reaction. We have re-measured the rates using new detector techniques and found results that differ considerably from previous work.
4. A strong experimental program has focused on the study of ignition and endpoint of the so-called “rp” process in X-ray bursts to determine the temperature, density, and time scale for X-ray burst modeling. Complementary to that, large-scale nucleosynthesis modeling has been performed to simulate the associated luminosity and nucleosynthesis conditions at the surface of neutron stars.
Fundamental Interactions and Weak Decays

The primary goal of this research effort is to use the atomic nucleus as a laboratory to probe for new physics beyond the "Standard Model" of elementary-particle interactions. We are also actively working on understanding nuclear structure issues that are critical for determining the efficiency of solar neutrino detectors. Some examples of the work being done are:

1. The very small electron-capture branch in the decay of $^{210}$In has recently been measured. This decay rate is a test of nuclear structure calculations that are being used to translate observed double b-decay rates into upper limits for parameters that characterize physics beyond the Standard Model.

2. We have recently measured the electron-neutrino correlation in a correlation Fermi nuclear beta decay with unprecedented precision. Our measurement allows us to put the most stringent constraints possible on scalar contributions to the weak interaction.

3. We are currently working on preparing an experiment that will search for Time-Reversal-Symmetry Violation in the decay of neutrons. Our experiment has already produced the most sensitive probe of this observable and an upcoming run will further improve our precision.

4. We are working on a high-precision determination of the electron-neutrino correlation in the nuclear beta decay of $^8$B and $^4$Li, which should allow us to make the most accurate measurements of G-parity breaking, and could allow determination of the up-down quark mass difference.

Nuclear Structure

The focus of this work is on studies of the fundamental modes of motion in nuclei. The dynamics of many-body quantum systems, including nuclei, relies heavily on fluctuations around an equilibrium shape. For many nuclei the equilibrium shape is non-spherical, resulting in a spectrum that is dominated by rotational structure. Of particular interest in studies of rotational dynamics are the characterizations of "super-deformed" structures and the search for "hyper-deformation," which involves highly elongated nuclear shapes.

An interesting new twist to rotational motion is the concept of "tilted axis rotation" whereby the nuclear rotation may occur about more than one axis. This results in interesting and novel phenomena like "wobbling motion" (akin to that of a wobbling top) and breakdown of chiral symmetry (the nuclei demonstrating leftright-handedness). Another topic of investigation is the so-called "anti-magnetic rotation" which is a novel form of nuclear motion: a symmetric rotation of nucleonic currents, leading to regular rotational bands of nuclei.

Vibrational dynamics in nuclei are not yet well understood. Schematically, vibrations can be described as multipole distortions spanning the range from monopole to high multipole oscillations around an equilibrium shape. Research is focused on isoscalar dipole oscillations (which are directly related to the nuclear incompressibility), as well as on quadrupole and octupole modes resulting in low-lying collective excitations superimposed onto the underlying rotational structure. Nuclear incompressibility is a fundamental property of nuclear matter and is crucial to our understanding of the phenomena of stellar collapse, supernovae, and collective flow in high-energy heavy-ion collisions. The only way to experimentally determine this quantity is via the monopole and isoscalar dipole vibrations in nuclei.

The mass of a nucleus is one of its most fundamental properties. Experimental nuclear masses and various mass models typically show excellent agreement near stability. Far from stability where there is very little or no information known, mass models diverge widely. Nuclear masses play a particularly crucial role in nucleosynthesis processes that take place in stellar explosions. For example, the rp-process (rapid proton capture) is thought to occur on the accretion disks of x-ray bursting binary neutron star systems. The r-process (rapid neutron capture) is responsible for the synthesis of the heavy elements in cataclysmic stellar scenarios. Both processes involve the creation of nuclei far from stability. Our current research interests are both in theory and experiment.

In theory, we are developing a reliable structure based mass model. In experiment, we have a research program for the measurement of nuclear masses along both processes. Some examples are given below.

1. Mass measurements of the N=Z waiting point nuclei $^{64}$Se, $^{90}$Zr, and $^{94}$Mo of the rp-process.

2. Mass measurements of neutron rich nuclei Ag, Sn, and Cd.

The main expertise of the Nuclear Structure groups lies in ray spectroscopy measurements using multi detector arrays, electron spectroscopy, and in the determination of the lifetimes of nuclear states using techniques capable of covering a wide range of intervals, from a femtosecond to several hundred picoseconds.

Research Experiences for Teachers (RET)

Notre Dame operates a Research Experience for Teachers (RET) program; which pairs high school teachers from the North Central Indiana/Southwest Michigan region with physics faculty in the department. Teachers in RET participate in a paid eight-week program of summer research and receive academic graduate research credit.

In principle, research is possible in any area of physics depending upon the mutual interest of the teacher and faculty mentor. Eight high school teachers were supported in this program in the summer of 2000, and we intend to expand the program to accommodate 12 participants per summer.

Graduate Facilities in Physics

The Department of Physics, located in Nieuwland Science Hall, has excellent research facilities both on and off campus. Astronomy/astrophysics research facilities include 20 nights a year at the 1.8 meter Vatican Advanced Technology Telescope (VATT) and 10 nights a year at the soon-to-be-completed 2x 8.5 meter Large Binocular Telescope (LBT). Current research is also conducted using a variety of telescopes, including the Hubble Space Telescope (HST), the Keck Telescope, the NASA Infrared Telescope (IRTF), and the Steward and Cerro-Tololo Observatories. An air-shower array located next to the campus is used to study high- (30-300GeV) and ultrahigh-energy (greater than 100TeV) cosmic rays, utilizing position-sensitive proportional wire detectors for precision angle measurements and particle identification. Facilities for accelerator-based atomic physics research include vacuum ultraviolet monochromators, high-resolution position-sensitive photon detectors, and heavy-ion accelerators. Experiments are also carried out at Argonne National Laboratory (ANL) and at GSI-Darmstadt, Germany. Precision measurements in atomic Cs, necessary for interpretation of parity nonconservation...
The department also has a well-equipped research library. A well-equipped machine shop and a capable staff of technicians serve the needs of the experimental research groups.

Course Descriptions
Each course listing includes:
- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

500. Physics Colloquium
(1-0-0) Bunker
A discussion of current topics in physics by guest lecturers and members of the faculty.
(Every year)

503. Methods of Theoretical Physics I
(3-0-3) Staff
A study of the methods of mathematical physics. Topics include linear vector spaces, matrices, group theory, complex variable theory, infinite series, special functions, and differential equations.
(Every year)

505. Theoretical Mechanics
(3-0-3) Staff
Lectures and problems dealing with the mechanics of a particle, systems of particles, and rigid bodies. The Lagrangian and Hamiltonian formulations of classical mechanics; theory of small oscillations, Introduction to special relativity. Introduction to nonlinear dynamics and chaos; bifurcation theory.
(Every year)

506. Electromagnetism
(3-0-3) Staff
Electrostatics; Laplace’s and Poisson’s equations; Legendre’s and Bessel’s equations; Green’s functions; static multipole expansions; magnetostatics; magnetic vector and scalar potentials; Maxwell’s equations; plane waves.

507, 508. Quantum Mechanics I and II
(3-0-3) (3-0-3) Staff
General Hilbert Space formulation of Quantum Mechanics; Schroedinger vs. Heisenberg picture; symmetries and conservation laws; Feynman path integrals; harmonic oscillator; the Coulomb problem; the Bohm-Aharonov effect; the theory of angular momentum; EPR correlations and Bell’s inequality; Bose-Einstein and Fermi-Dirac statistics; elementary approximation methods; scattering theory.
(Every year)

510. Methods of Experimental Physics
(2-2-3) Staff
A lecture and laboratory course on methods of modern experimental physics. The course is designed to expose first-year graduate students to all aspects of experimental physics from instrumentation and data acquisition to statistical treatment of data. Computer-related equipment includes LABVIEW data-acquisition software, Pentium MMX personal computers, and Ultrasparc workstations. Instrumentation includes state-of-the-art detectors from inorganic scintillators to solid state detectors, lasers, X-ray sources, and NMR and ESR magnets. The course is designed around 10 experiments in astrophysics, atomic, condensed matter, high energy, and nuclear physics. An important part of the course is equipment design, familiarity with various detection systems, electronic pulse-processing, and in-depth knowledge of computer to equipment interfaces.
(Every year)

531, 532, 533. Current Topics in Physics
(3-0-1) (3-0-1) (3-0-1) Staff
Discussion of topics of current interest in physics.
(Offers as needed)

587. Interpretive Problems in Quantum Mechanics
(3-0-3) Cushing
This course is intended for graduate students in physics and in the history and/or philosophy of science who wish to examine in some reasonable detail the roots, both historical and philosophical, of quantum mechanics and the profound conceptual problems to which that theory has given rise. The main vehicle for this will be a study of original seminal papers in the field (e.g., those by Planck, Bohr, Heisenberg, Schrödinger, Born, Einstein, Podolsky and Rosen, von Neumann, Bell, Bohm) and of related papers in the foundations of physics literature. Some background in physics, especially in the formalism of quantum mechanics, is desirable. However, the relevant physics and philosophy will be presented in the course itself. (Offered as needed)
participants in the RET (Research Experience for Teachers), or similar programs that partner high school teachers with atomic physicists. Participants will be introduced to atomic physics in informal lectures with faculty, with course notes and reference texts available. Additionally, they will participate in directed research associated with current atomic physics experiments being carried out by department faculty. Students maintain a research logbook and submit a written research summary at the conclusion of the research period.

598B. Directed Research in Biophysics (V-V-V) Glazier
This course is for high school teachers participating in biophysics research in the physics department, for example as participants in the RET (Research Experience for Teachers), or similar programs that partner high school teachers with biophysicists. Participants will be introduced to biophysics in informal lectures with faculty, with course notes and reference texts available. Additionally, they will participate in directed research associated with current biophysics experiments being carried out by department faculty. Students maintain a research logbook and submit a written research summary at the conclusion of the research period.

598C. Directed Research in Condensed Matter Physics (V-V-V) Bunker
This course is for high school teachers participating in condensed matter physics research in the physics department, for example as participants in the RET (Research Experience for Teachers), or similar programs that partner high school teachers with condensed matter physicists. Participants will be introduced to condensed matter physics in informal lectures with faculty, with course notes and reference texts available. Additionally, they will participate in directed research associated with current condensed matter physics experiments being carried out by department faculty. Students maintain a research logbook and submit a written research summary at the conclusion of the research period.

598N. Directed Research in Nuclear Physics (V-V-V) Kolata
This course is for high school teachers participating in nuclear physics research in the physics department, for example as participants in the RET (Research Experience for Teachers), or similar programs that partner high school teachers with nuclear physicists. Participants will be introduced to nuclear physics in informal lectures with faculty, with course notes and reference texts available. Additionally, they will participate in directed research associated with current nuclear physics experiments being carried out by department faculty. Students maintain a research logbook and submit a written research summary at the conclusion of the research period.

601. Electrodynamics (3-0-3) Staff
Scattering and diffraction; special relativity; covariant formulation; radiation from charges; multipole expansions; radiation damping. (Every year)

602. Statistical Thermodynamics (3-0-3) Staff
Review of basic elements of phenomenological thermodynamics; kinetic theory and transport equation; dilute gases in equilibrium; classical statistical mechanics; microcanonical, canonical and grand canonical ensembles; quantum statistical mechanics; the renormalization group, critical phenomena and phase transitions. (Every year)

603. Quantum Mechanics III (3-0-3) Staff
Advanced topics in nonrelativistic quantum mechanics: advanced approximation methods, partial wave expansions, and the optical theorem, Berry’s phase; relativistic quantum mechanics; the Dirac equation, the electromagnetic interactions of the Dirac particle, the fine structure of atoms, Klein’s paradox; basic elements of quantum field theory: Lagrangian and Hamiltonian formulation, the existence of antiparticles, the Feynman rules with elementary applications; one-loop renormalization and the renormalization group. (Every year)

604. Quantum Field Theory (3-0-3) Staff
General formulation of quantum field theories; the spin-statistics theorem; CPT invariance and its tests; local gauge theories; symmetries, conservation laws, Ward identities and anomalies; Feynman path integrals; Feynman rules for abelian and nonabelian gauge theories; ghosts; the general renormalization program for gauge theories and the renormalization group; asymptotic freedom and slavery; spontaneous realization of symmetries and the Higgs mechanism; Grand Unification. (Offered as needed)

605. Astrophysics (3-0-3) Staff
An introductory course in astrophysics covering such topics as spectral and color indices, photometry, variable stars, mass functions, theoretical stellar models, synthesis of elements, white dwarfs, neutron stars, supernova, cosmic rays, galaxies and cosmology. (Every year)
607, 608. Atomic Physics
(3-0-3) (3-0-3) Staff
Atomic structure and properties. Spectroscopy of simple and complex atomic systems, the Schrödinger and Dirac equations, Hartree-Fock methods, allowed and forbidden radiative transitions, and hyperfine splitting. Further topics that may be covered are laser-atom interactions, laser cooling and trapping, photoionization, atomic collisions, many-body perturbation theory, quantum electrodynamics, and atomic parity nonconservation. (The first semester is offered every year; the second semester is offered as needed.)

609, 610. Nuclear Physics
(3-0-3) (3-0-3) Staff
The nucleus as a Fermi gas; the Von Weizsäcker mass formula; tensor algebra and the Wigner-Eckart theorem; isospin; independent-particle motion; the many-body problem in nuclear physics; the Hartree-Fock self-consistent field; the shell model; collective nuclear motion; rotations and vibrations; pairing forces; nuclear reaction theory; electromagnetic and weak interactions; fundamental symmetries and searches for "new physics" in the context of the nucleus; nuclear astrophysics; the solar neutrino problem; use of electron scattering as a tool to investigate the structure of the nucleus and the nucleon; quarks and gluons in relativistic heavy ion collisions. (The first semester is offered every year; the second semester is offered as needed.)

613. Solid-State Physics
(3-0-3) Staff
Free electron theories of solids; Drude and Sommerfeld theory; crystal and reciprocal lattices; diffraction; Bloch electrons; band structure and the Fermi surface; cohesive energy; classical and quantum theory of the harmonic crystal, phonons; dielectric properties of insulators; semiconductors; paramagnetism and diamagnetism, magnetic ordering; superconductivity. (Every year)

614. Solid-State Physics
(3-0-3) Staff
Advanced topics in condensed matter physics chosen from such areas as: critical phenomena; high-temperature superconductivity; quantum fluids; spin glasses; quantum wells and quantum dots; quantum Hall effect; “soft” condensed matter systems. Survey of modern experimental techniques such as molecular-beam epitaxy; dilution refrigerators; XAFS, ESR, X-ray, and neutron scattering. (Offered as needed)

617, 618. Elementary Particle Physics
(3-0-3) (3-0-3) Staff
Relativistic transformations and kinematics; symmetries and conservation laws; selection rules; basic elements of group theory; the quark model and fundamental interactions in nature; abelian and nonabelian gauge theories; the Standard Model of High Energy Physics, its Feynman rules and renormalization; the Higgs mechanism; the CKM matrix; Supersymmetry and Supergravity; Grand Unification; empirical foundations: accelerators, detectors and experimental techniques; crucial experiments. (The first semester is offered every year; the second semester is offered as needed.)

619. Stars and Stellar Evolution
(3-0-3) Staff
Stars and stellar evolution. Observables of stellar astronomy and star classification, astrophysical hydrodynamics, stellar interiors, hydrostatic equilibrium, energy transport, stellar opacities, equation of state, thermonuclear reaction rates, nucleosynthesis. The evolution of main sequence and post main sequence stars along the Hertzsprung-Russell diagram, stages of thermonuclear burning. Stellar pulsations and transients. Basic theory of star formation and gravitational collapse. Formation and evolution of planetary systems. Relativistic hydrodynamics including white dwarfs, neutron stars, black holes, accretion discs and X-ray transients. Binary star evolution. Stellar collapse and supernovae. (Offered as needed)

620. Galactic Dynamics and Theoretical Cosmology
(3-0-3) Staff
A course on stellar systems, galaxies, and the large-scale structure of the universe and microwave background. Observational properties of galaxies and galactic clusters. Galaxy morphology. Galaxy models including: gravitational collapse and star formation, galactic halos, galactic chemical evolution, potential theory, stellar orbits and the theory of the equilibrium configurations of stellar systems. The theory of spiral structure, collisions and encounters between stellar systems, and two-body relaxation in the approach to equilibrium. Dark matter content of galaxies, clusters and the intergalactic medium. Models of large-scale structure including: cold, hot, and mixed-dark matter models. The formation and evolution of galactic and extragalactic cosmic radiation. The origin, radiation transport, and structure of the cosmic microwave background radiation and other diffuse backgrounds. Inflationary cosmology, cosmic phase transitions, primordial nucleosynthesis. (Offered as needed)

621. General Relativity
(3-0-3) Staff
Physical principles of General Relativity, tensor algebra, Einstein field equations. The Schwarzschild solution and applications, including terrestrial and near-terrestrial experiments, and (non-rotating) black holes. Stellar structure, white dwarves, and neutron stars. Standard cosmology and the Friedman solutions, the early universe, relic background radiation, and the cosmological helium abundance. (Offered as needed)

625, 626. Special Topics in Physics
(3-0-3) (3-0-3) Staff
Discussions of topical concepts in physics. (Offered as needed)

651, 652. Topics in Nuclear Physics
(2-0-2) (2-0-2) Staff
Discussions of research and current literature in nuclear physics. (Every year)

653, 654. Topics in Atomic Physics
(2-0-2) (2-0-2) Staff
Discussions of research and current literature in atomic physics. (Every year)

655, 656. Topics in Elementary Particle Physics
(2-0-2) (2-0-2) Staff
Discussions of research and current literature in elementary particle physics. (Every year)

657, 658. Topics in Theoretical Physics
(2-0-2) (2-0-2) Staff
Discussions of research and current problems in theoretical physics. (Every year)

659, 660. Topics in Solid-State Physics
(2-0-2) (2-0-2) Staff
Discussions of research and current literature in solid-state physics. (Every year)

661. Astrophysics Seminar
(2-0-2) (2-0-2) Staff
Discussion of research and current literature in astrophysics. (Every year)
671. Early Universe Seminar
(2-0-2) Staff
Application of particle and nuclear physics to the early universe. Subjects covered will include: isotropy and homogeneity of the universe, microwave background radiation, “Big Bang” cosmology, inflation models, the “standard model” of high energy physics, baryosynthesis and “Grand Unified” theories, nucleosynthesis, cosmic strings, and “dark” matter. (Every year)

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident graduate students.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

In addition to the foregoing, certain advanced undergraduate courses may be taken for graduate credit.

Faculty


GERALD B. ARNOLD, Professor. B.A., Northwestern Univ., 1968; M.S., Univ. of California, Los Angeles, 1972; Ph.D., ibid., 1977. (1978)


JAMES M. BISHOP, Research Professor. A.B., Kansas State Teachers College, 1958; M.S., Univ. of Wisconsin, 1960; Ph.D., ibid., 1967. (1972)


SAMIR K. BOSE, Professor. B.S., Delhi Univ., 1956; M.S., ibid., 1958; Ph.D., Univ. of Rochester, 1962. (1966)

BRUCE A. BUNKER, Chair and Professor. B.Sc., Univ. of Washington, 1974; Ph.D., ibid., 1980. (1983)

NEAL M. CASON, Professor. A.B., Ripon College, 1959; M.S., Univ. of Wisconsin, 1961; Ph.D., ibid., 1964. (1965)

JAMES T. CUSHING, Professor. B.S., Loyola Univ., 1959; M.S., Northwestern Univ., 1960; Ph.D., State Univ. of Iowa, 1963. (1966)


JACEK K. FURDYNA, Aurora and Tom Marquez Professor of Physics. B.S., Loyola Univ., Chicago, 1955; Ph.D., Northwestern Univ., 1960. (1986)


UMESH GARG, Professor. B.S., Birla Institute of Technology, Pilani, India, 1972; M.S., ibid., 1974; M.A., State Univ. of New York, Stony Brook, 1975; Ph.D., ibid., 1978. (1982)

PETER M. GARNAVICH, Assistant Professor. B.S., Univ. of Maryland, 1980; M.S., Massachusetts Inst. of Technology, 1983; Ph.D., Univ. of Washington, 1991. (2000)

ULRICH GIESEN, Research Assistant Professor. B.S., Univ. Münster, Germany, 1984; M.S., ibid., 1987; Ph.D., Univ. of Notre Dame, 1992. (1998)


JOACHIM GÖRRES, Research Professor. B.S., Univ. of Munster, 1974; Diplom., 1979; Ph.D., ibid., 1983. (1989)


ANTHONY K. HYDER, Associate Vice President for Graduate Studies and Research and Professor. B.S., Univ. of Notre Dame, 1962; Ph.D., Air Force Institute of Technology, 1971. (1991)


WALTER R. JOHNSTON, Frank M. Freimann Professor of Physics. B.S., E.U., Univ. of Michigan, 1952; M.S., ibid., 1953; Ph.D., ibid., 1957. (1958)

GERALD L. JONES, Professor. B.S., Univ. of Kansas, 1956; Ph.D., ibid., 1960. (1963)

JAMES J. KOLATA, Professor. B.S., Marquette Univ., 1964; M.S., Michigan State Univ., 1966; Ph.D., ibid., 1969. (1977)


LARRY O. LAMM, Research Associate Professor. B.S., East Carolina Univ., 1978; M.S., ibid., 1983; Ph.D., Univ. of Notre Dame, 1989. (1994)


MONICA LYNKER, Guest Assistant Professor and Assistant Professor at Indiana University South Bend. Vordiplom, G.H. Siegen, 1984; Ph.D., UT Austin, 1990. (2000)

EUGENE R. MARSHALEK, Professor. B.S., Queens College, 1957; Ph.D., Univ. of California, Berkeley, 1962. (1965)

GRANT J. MATHEWS, Professor. B.S., Michigan State Univ., 1972; Ph.D., Univ. of Maryland, 1977. (1994)

PATRICK J. MOONEY, Visiting Research Assistant Professor. B.S., Univ. of Notre Dame, 1978; Ph.D., ibid., 1986. (1998)

KATHIE E. NEWMAN, Associate Dean in the College of Science and Professor. B.Sc., Michigan State Univ., 1974; Ph.D., Univ. of Washington, 1981. (1983)


RANDEL C. RUCHTI, Professor. B.S., Univ. of Wisconsin, 1968; M.S., Univ. of Illinois, 1970; Ph.D., Michigan State Univ., 1973. (1977)
The Division of Science

**Interdisciplinary Programs**

**Applied Mathematics**

The Department of Mathematics at the University of Notre Dame offers an interdisciplinary master of science in applied mathematics (M.S.A.M.). The goal of the M.S.A.M. is to produce skilled and creative scholars who will be able to use sophisticated mathematical techniques in their professional activities and go beyond the established mathematical paradigms in their particular areas of interest.

The mathematics background of a successful applicant to the M.S.A.M. degree program is expected to include a four-semester calculus sequence and two additional courses of substantial mathematical content such as linear algebra and differential equations.

After a student is accepted into the program, he/she must present a proposal for a plan of study leading to the M.S.A.M. that should aim both to expand the student’s mathematical horizons and to develop his/her expertise in the intended area of application. The graduate committee of the mathematics department will evaluate the student’s proposal in close consultation with appropriate faculty members from other departments, a process that also serves the purpose of facilitating the selection of the student’s official adviser who may come from either the mathematics department or a collaborating department. The student’s proposed plan of study, including the mathematical content of the courses of the interdisciplinary component (see below), requires the approval of both the graduate committee of the mathematics department and the student’s adviser. Once approved, the proposed plan of study becomes the student’s official plan of study.

The program of study for the M.S.A.M. consists of a core mathematics component and an interdisciplinary component for a total course requirement of 24 credit hours.

The core component of mathematics contains either nine or 12 credit hours, depending on both the background and the interests of the student. It consists of a numerical methods course that features a thorough discussion of the mathematical foundations of numerical analysis and such concepts as ill-conditioning, numerical stability and error analysis; at least one course in basic graduate mathematics, which can be chosen in an area that parallels the student’s field of interest; and a choice of topics in applied mathematics.

The interdisciplinary component accounts for the additional 12 to 15 credit hours. These can be met by an appropriate selection of courses in any graduate discipline at Notre Dame that makes serious use of mathematics. With the approval of the adviser, the student may pursue an interdisciplinary master’s thesis under the adviser’s direction. If written and defended in accordance with the standard procedures of the Graduate School, the thesis satisfies six of these credit hours. A second way in which the student can complete the requirements of the interdisciplinary component is with a meaningful interdisciplinary project carried out under the adviser’s supervision. The written exposition of the project requires the approval of the adviser and the director of Graduate Studies of the Department of Mathematics.

For additional information, contact the Department of Mathematics at (219) 631-7245.

**The Molecular Biosciences Program**

**Director:**
Joseph E. O’Tousa, Professor of Biological Sciences
E-mail: jotousa@nd.edu
(www.science.nd.edu/MBP/MBP.html)

Current research probing the molecular details of the biological sciences requires simultaneous application of genetic, biochemical, and molecular biological principles and expertise. The Molecular Biosciences Program (M.B.P.) provides a broad range of training opportunities for students seeking careers within this active research field. Faculty participants of the Department of Biological Sciences and the Department of Chemistry and Biochemistry administer the M.B.P. within the College of Science. Students interested in the M.B.P. program should apply for admission to the Department of Biological Sciences or Chemistry and Biochemistry depending on their research interests.

**Research Facilities**

The Department of Biological Sciences, housed in the modern Galvin Life Sciences complex, has excellent facilities for all laboratory research in molecular biology. Facilities and training opportunities are available in genetics, molecular and cell biology, and developmental biology. The Department of Chemistry and Biochemistry has training opportunities in the fields of gene expression, protein structure and enzyme kinetics. Many M.B.P. faculty have research activities within the newly established Walther Cancer Center and Keck Transgene Center.
The University maintains modern research facilities in support of the Molecular Biosciences Program. The Biosciences Core Facility maintains instrumentation for DNA, RNA, and peptide synthesis, amino acid and carbohydrate analysis, and protein and peptide sequencing. The Department of Biological Sciences houses an optics facility for confocal microscopy and scanning and transmission electron microscopy and a new flow cytometry facility equipped with a Coulter Epics XL flow cytometer and a Coulter ALTRA flow sorter. The College of Science NMR Facility contains state-of-the-art high field spectrometers that support both chemical and biological nuclear magnetic resonance research. The Mass Spectrometry Facility is equipped to analyze high mass biomolecules and determine exact masses of low and medium size molecules. The Freimann Life Science Center provides a modern animal care facility. The staff of certified veterinary technicians ensures proper care and use of laboratory research animals. Several science libraries are found on campus in Nieuwland Science Hall, the Radiation Laboratory, and the Galvin Life Sciences Building. Additional resources are available in the main campus Hesburgh Library.

**Degree Requirements**

Students participating in the Molecular Biosciences Program must complete the degree requirements of either the Department of Biological Sciences or the Department of Chemistry and Biochemistry. Several courses are designed for all M.B.P. students, and are usually taken during the first year of graduate school. There are additional elective courses in each department to allow for specialization within the M.B.P. Students in the Biological Sciences are required to take Molecular Biology I and II, Fundamentals of Biochemistry, and five elective courses. These are minimum requirements. The student’s research advisor and committee may require additional courses based on the background and research interests of the student. In the Department of Chemistry and Biochemistry there are specific requirements depending on the focus of the study. A student in Biochemistry is required to take Fundamentals of Biochemistry, Intermediary Metabolism, Molecular Biology I, and Advanced Biochemical Techniques. In Organic Chemistry, a student is required to take Advanced Organic Chemistry I, Advanced Organic Chemistry II, and Synthetic Organic Chemistry, with an additional nine credit hours of courses.

All M.B.P. students must pass both oral and written comprehensive examinations. Students will conduct original research and write an approved dissertation on this work. The work is conducted under the direction of an adviser participating in the M.B.P. Students in the program also must complete a one-year teaching requirement that usually involves assisting in the instruction of laboratory courses within their discipline. All students participate in the seminar activities of the program.

**Course Descriptions**

Both required and elective courses of the Molecular Biosciences Program are categorized according to the department offering the course. Please refer to the section on degree requirements for more information.

**Biological Sciences**

**Developmental Genetics**

Analysis of the cellular and molecular genetic mechanisms underlying animal development, with emphasis on major vertebrate and invertebrate model systems.

**Immunology**

An introductory course emphasizing the cells and tissues of the immune system and the nature and function of antigens and antibodies.

**Molecular Biology**

**I**

Physical chemistry of nucleic acids, bacterial genetics, principles of cloning, DNA replication and recombination, prokaryotic and eukaryotic transcription, RNA processing and translation. Listed also as BIOS 531.

**II**

Yeast genetics and molecular biology; retroviruses and transposable elements; recombinant DNA: tools and applications in Drosophila, yeast, and mice. Listed also as BIOS 532.

**Advanced Cell Biology I**

The basic biochemical, structural, and biophysical properties of key systems involved in membrane transport, protein trafficking, bioenergetics, cell signaling, vesicular transport, organelle biogenesis, and cytoskeletal functions.

**Advanced Cell Biology II**

The biochemical, structural, and biophysical properties of key systems involved in cellular adhesion, cell cycle regulation, programmed cell death (apoptosis), and the relationship to mechanisms of disease leading to carcinogenesis, aging.

**Immunobiology of Infectious Diseases**

Course focuses on the cellular and molecular mechanisms behind human diseases. Specifically, the design and effects of drug treatments on microbial and cellular processes and the development and implementation of vaccines.

**Topics in Tumor Biology**

Course examines the cell and molecular basis of tumor genesis and development in specific cancer cell types.

**Chemistry and Biochemistry**

**Fundamentals of Biochemistry**

Chemistry of carbohydrates, amino acids, proteins, nucleotides, nucleic acids, lipids, and enzymes.

**Intermediary Metabolism**

A study of the chemical reactions characteristic of living systems.

**Molecular Biology I**

Physical chemistry of nucleic acids, bacterial genetics, principles of cloning, DNA replication and recombination, prokaryotic and eukaryotic transcription, RNA processing and translation. Listed also as BIOS 531.

**Molecular Biology II**

Yeast genetics and molecular biology; retroviruses and transposable elements; recombinant DNA: tools and applications in Drosophila, yeast, and mice. Listed also as BIOS 532.

**Enzyme Chemistry**

Physical and chemical properties and mechanism of action of enzymes and their role in metabolic processes.

**NMR Spectroscopy in Chemistry and Biochemistry**

A survey of modern NMR methods used to determine molecular structure and conformation, study chemical and biochemical reactivity, and probe metabolic processes in biological systems.

**Chemical Basis of Gene Expression**

Emphasis is placed on eukaryotic gene structure, replication, transcription, and translation.

**Advanced Organic Chemistry I and II**

The theoretical basis of organic chemistry
and a detailed study of the preparation and reactions of organic compounds.

Synthetic Organic Chemistry
A systematic and critical study of the synthetic methods of modern organic chemistry, including the development of multistage syntheses.

Teaching, Research Fellowships
Financial support is available to all students. The Molecular Biosciences Program nominates outstanding applicants for University-wide fellowships, some of which are specific for female and minority candidates. The M.B.P. also administers program-specific fellowships that support incoming and matriculating students. Research assistantships are available in many of the research laboratories, and teaching assistantships are available to all students. Teaching assistantships typically involve 10 to 12 hours of work per week teaching within an undergraduate laboratory course. All M.B.P. students are awarded full-tuition scholarships.

Application and Admission
Students interested in the Molecular Biosciences Program must apply for admission to one of the departments involved in the program, Biological Sciences or Chemistry and Biochemistry. Applicants should choose the department that best serves their training goals. Each department has different degree requirements, as described above. Usually the research adviser will be in the same department as the student, although this is not a necessity.

To apply to this program, please submit a completed Graduate School application form. On this application, you must specify to which of the host departments (Biological Sciences or Chemistry and Biochemistry) you are applying, and specify that your area of interest or specialization will be the Molecular Biosciences Program. Transcripts of all previous academic credits, three recommendation forms from undergraduate instructors aware of your qualifications, and a statement of purpose are also required.

Graduate Record Exam (GRE) scores must also be submitted for the Verbal, Quantitative, and Analytical exams and your choice of one Advanced Study Examination. The GRE advanced test is required for consideration within the Department of Biological Sciences and is highly recommended for the Department of Chemistry and Biochemistry.

Faculty and Research
Biological Sciences
JOHN H. ADAMS, molecular interactions of malaria merozoites with host erythrocytes and genetic/antigenic variation of Plasmodium.
CRISLYN D’SOUZA-SCHOREY, Small GTPases in cell signaling and membrane trafficking.
JOHN G. DUMAN, Physiological and biochemical adaptations to subzero temperatures, especially (1) structure and function of antifreeze proteins and ice nucleating proteins, and (2) studies of transgenic plants expressing insect antifreeze proteins.
MALCOLM J. FRASER JR., baculovirus molecular genetics, transposons, transgenic engineering of insects.
FREDERICK W. GOETZ JR., cellular regulation of ovulation.
DAVID R. HYDE, molecular genetics of Drosophila vision, molecular genetics of eye development and retinal degeneration in zebrafish, mechanisms of neuronal regeneration in zebrafish.
ALAN L. JOHNSON, ovarian follicular growth, differentiation, and atresia; apoptosis.
JOSEPH E. O’TOUSA, maturation, structure, and function of rhodopsin, molecular genetics of retinal degeneration, control of cell death processes.
JEFFREY S. SCHOREY, molecular and cellular processes of mycobacterium-host cell interactions.
NEIL F. SHAY, molecular, cellular, and physiological aspects of nutrition and nutrient deficiencies.
MARTIN P.R. TENNISWOOD, Tumor Biology, apoptosis in hormone dependent cancers.
KEVIN T. VAUGHAN, dynein complex, dynein-mediated organelle transport.
JOELLEN J. WELSH, breast cancer, apoptotic mechanisms.

Chemistry and Biochemistry
SUBHASH C. BASU, regulation of glycosyltransferases during development, DNA polymerase-α, associated lectin in eukaryotic DNA replication.

FRANCIS J. CASTELLINO, in vivo and in vitro structure-function relationships of blood coagulation and fibrinolysis proteins.
HOLLY V. GOODSON, dynamics of microtubule assembly, regulation of cytoskeletal structure.
P unlawful discrimination and encourage applications from individuals of diverse backgrounds.

For additional information about the Molecular Biosciences Program, please write: Dr. Joseph E. O’Tousa, Director, Molecular Biosciences Program, Dept. of Biological Science, University of Notre Dame, Notre Dame, IN 46556.
	Telephone: (219) 631-6093
	E-mail: jotouusa@nd.edu

For information specific to the departments involved in the Molecular Biosciences Program, please write the corresponding graduate director:

Biological Sciences:
Dr. F.R. Goetz, Director, Graduate Studies, Dept. of Biological Science, University of Notre Dame, Notre Dame, IN 46556.
Telephone: (219) 631-6552
E-mail: biosadm@nd.edu
Chemistry and Biochemistry:
Dr. Brad Smith
Director, Graduate Studies
Dept. of Chemistry and Biochemistry
University of Notre Dame
Notre Dame, IN 46556
Telephone: (219) 631-5759/6705
E-mail: smith.115@nd.edu

M.D./Ph.D. Joint Degree Program

Acting Director:
John F. O’Malley, Ph.D.
Telephone: (219) 631-5574
E-mail: sbcme@nd.edu
(www.nd.edu/~sbcme/md_phd.html)

The Program of Studies
The University of Notre Dame and Indiana University School of Medicine offer a joint M.D./Ph.D. degree for exceptional students interested in academic medicine. This unusual partnership between a private Catholic university and a state-supported medical school was formed in 1995. The program draws on the strengths of the medical faculty and the research excellence of the graduate program faculty to train scientists who can bridge the gap between clinical medicine and basic life sciences.

The South Bend Center for Medical Education (I.U. School of Medicine) has announced plans to build a new Medical Education facility that will also house the Notre Dame Transgene Center.

General Requirements
To earn the joint degree, students will complete the first two years of medical school at the South Bend Center for Medical Education (SBCM), located on the Notre Dame campus, and continue at Notre Dame for three more years to pursue the University’s doctoral degree through the Graduate School. The last two years of medical school then will be completed at the Indiana medical school’s main campus in Indianapolis.

Program descriptions and requirements, as well as course and faculty listings for all of Notre Dame’s doctoral programs, may be found elsewhere in this Bulletin. Students in the M.D./Ph.D. program may pursue the doctoral degree in any of these disciplines. Course and faculty listings specific to the medical training may be found below.

Admission
Admission to the program requires separate applications to the Notre Dame Graduate School and the Indiana medical school. The Graduate School will accept MCAT scores in place of the GRE scores required of all applicants. The parallel applications will be coordinated and tracked by the South Bend Center for Medical Education, which serves as the central office for the combined degree program. Representatives from Notre Dame and the I.U. School of Medicine monitor and oversee the program.

Application to the joint degree program will not jeopardize a student’s application to either the Graduate School or the School of Medicine. The student may be admitted to either school independently. Students admitted into the joint degree program will receive both tuition and stipend assistance.

For information and application materials, interested students should contact the Office of the Director, South Bend Center for Medical Education, B22 Haggard Hall, Notre Dame, IN 46556, telephone (219) 631-5574.

Course Descriptions
The following courses offered in the center and the University are central to center programs. Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

SBCM 501. Gross Anatomy
3-9-8 O’Malley
An intensive study of the gross structure of the human body, accomplished through maximum student participation in the dissection of the human cadaver together with formal lectures and assigned readings.

SBCM 503. Neuroscience
3-5.5-3-5.5 Kingsley
An integrated course that canvasses the biophysics, biochemistry, anatomy, physiology, and pathology of the human nervous system and its vasculature.

SBCM 504. Human Physiology
3-3.5-8 Olson
The study of the physiology of the cardiovascular, respiratory, renal, endocrine, and gastrointestinal systems. Emphasis is placed on medical aspects of human physiology. Student participation laboratories are used to demonstrate classic physiologic principles and current bioanalytic techniques.

SBCM 505. Histology/Embryology
2-5-3-5-5 Hamlett
The study of microscopic anatomy of normal human tissues. Light microscopy receives the major emphasis, but electron microscopic structure is included in areas of special interest. Two lecture hours per week are devoted to the fundamentals of embryology.

SBCM 512. Behavioral Science
2-0-2 Macr
This course focuses on the emotional, intellectual, and social development of the human being. Every attempt is made to help medical students understand their own personalities and to begin the process of using themselves as therapeutic agents.

SBCM 556. Medical Microbiology
3.5-5-7 Cole
A diversity of microbiology and related subtopics are studied within this course, including immunology, virology, bacteriology, parasitology, mycology, and aspects of infectious disease. While primary emphasis is on the biology and pathogenic mechanisms of individual organisms, microbe relationships are discussed extensively throughout the course.

SBCM 600. Introduction to Clinical Medicine I: The Patient-Doctor Relationship
2-0-2 Staff
A multidisciplinary interdisciplinary course designed to introduce students to the patient-doctor relationship through interactions with faculty and patients in a variety of settings. In small groups facilitated by primary care and behavioral science faculty, students direct their learning toward the complexity of the context from which a patient seeks medical care. In order to achieve this, students examine normal human behavior and development throughout the life cycle. Issues addressed include preventive health care, sexuality, cultural diversity, minority health issues, religion and spirituality, family dynamics, the economics of health care, and death and dying.

SBCM 605. Medical Genetics
2-0-2 McKee
A survey course of lectures and discussions dealing with the mechanisms and patterns of inheritance. Emphasis on human genetic disorders. Students may also participate in the Memorial Hospital Regional Genetic Counseling Clinic, where they will be introduced to genetic diagnosis, management and counseling of patients with genetic diseases.
SBCM 651. Introduction to Medicine
(19-0-19) Magneson
A multidepartmental course designed to introduce clinical medicine. Includes medical history taking and physical examination skills learned at the bedside with direct patient contact. Clinical medicine is surveyed concurrently with emphasis on pathophysiology and diagnosis. Problem-solving skills are stressed, including synthesis and interpretation of medical data.

SBCM 652. Biostatistics
(1-0-1) Christ
Biostatistics for medical students.

SBCM 653. General Pathology
(3-1-4) Prahlow
The study of diseases that affect human tissues. Emphasis is placed on the principles of inflammation, necrosis, repair, growth disturbances, and hemodynamic and metabolic disorders. Students participate in laboratory exercises, which are constructed for problem case analysis.

SBCM 654. Pharmacology
(5-2-7) Christ
A systematic study of the mechanism of action, disposition, and fate of drugs in living systems with emphasis on drugs of medical importance.

SBCM 654. Systemic Pathology
(8-0-8) Prahlow
The study of disease and its relationship to structural and functional abnormalities of specific organ systems. Emphasis is placed on both pathologic anatomy and clinical manifestations of disease.

CHEM 667M. Biological Chemistry
(5-0-5) McKee
The lecture sequence provides an analysis of current biochemical topics and an introduction to those areas of biochemistry that are especially relevant in medicine. Emphasis is placed on metabolic pathways, endocrine control, and related clinical problems.

Additional programs in biomedically related sciences appear elsewhere in the Bulletin in the departments of biological sciences (parasitology, vector biology, virology, bacteriology, and chemistry and biochemistry).

Faculty
DARYL D. CHRIST, Adjunct Associate Professor (biological sciences). B.S., Univ. of Iowa, 1964; Ph.D., Loyola Univ. of Chicago, 1969. (1983)

NANCY L. COLE, Adjunct Assistant Professor (biological sciences). B.A., St. Olaf College, 1976; Ph.D., Univ. of Texas, 1982. (1985)


ROBERT E. KINGSLEY, Adjunct Associate Professor (biological sciences). B.A., Univ. of Michigan, 1965; Ph.D., Indiana Univ., 1971. (1974)

FAYE L. MAGNESON, Adjunct Assistant Professor (clinical) (biological sciences). B.S., Univ. of Northern Colorado, 1975; M.D., Bowman Gray Medical School, 1979. (1993)


KENNETH R. OLSON, Adjunct Professor (biological sciences). B.S., Univ. of Wisconsin, LaCrosse, 1969; M.S., Michigan State Univ., 1970; Ph.D., ibid., 1972. (1975)

JOHN F. O’MALLEY, Acting Director of the South Bend Center for Medical Education and Adjunct Associate Professor (biological sciences). B.S., Holy Cross College, 1952; M.S., Worcester State, 1957; Ph.D., Creighton Univ., 1971. (1971)

JOSEPH A. PRAHLLOW, Guest Associate Professor (clinical) (biological sciences). B.S., Valparaiso Univ., 1986; M.D., Indiana Univ. School of Medicine.

MARK M. WALSH, Adjunct Assistant Professor (clinical) (biological sciences). B.A., Univ. of Notre Dame, 1969; M.D., Univ. of Bologna, 1976. (1994)
The Division of Social Sciences

In the Division of Social Sciences, programs of graduate study are offered by the departments of economics, government and international studies, psychology, and sociology leading to the degree of doctor of philosophy. Programs leading to the degree of master of arts are also available, including an interdisciplinary master’s degree in peace studies, as well as a master of education degree.

The primary concern of the Division of Social Sciences is the professional development of the graduate student. This is accomplished as follows: (1) through course offerings, workshops, and seminar programs that provide a thorough analysis of the current theoretical developments of the various disciplines; (2) by employment of and training in modern research techniques; (3) by close, personal contact with the faculty and the faculty’s current research interests and efforts; and (4) through an appropriate program tailored to the professional needs and interests of the student.

The Laboratory for Social Research supports programs of investigation through statistical consulting, survey design, and management of databases. Centers and institutes provide a framework for multidisciplinary approaches to issues in the social sciences. The Helen Kellogg Institute for International Studies emphasizes the issues and problems of development and emerging democracy in the Third World, with primary attention to Latin America. The Joan B. Kroc Institute for International Peace Studies emphasizes innovative approaches to conflict resolution.

Economics

Chair:
Richard A. Jensen
Director of Graduate Studies:
Kali Rath
Director of Graduate Admissions and Placement:
Martin H. Wolfson
Telephone: (219) 631-6335
E-mail: baker.49@nd.edu
(www.nd.edu/~economic)

The Program of Studies
The goal of the Department of Economics is to graduate students who have the expertise to assist in the solution of the economic problems facing humanity. Graduate programs in economics from the University of Notre Dame will be distinctive for their combination of technical competence, familiarity with alternative approaches, and concern for values in economics.

The program in economics, designed to fulfill the above goals, rests on the following principal elements:
1. A solid foundation in micro- and macroeconomic theory, statistics and econometrics, political economy, history of economic thought, and methodology.
2. Training in the analysis of the creation and distribution of wealth, the causes of poverty and inequality, and the formulation of policies to alleviate poverty and promote the development of urban centers, backward regions, and underdeveloped countries.
3. Full use of the variety of methodologies, including neoclassical, post-Keynesian, neo-Marxian, and institutionalist, available for the study of economic relations and events.

The graduate doctoral program consists of four major elements: (1) graduate core courses required of all Ph.D. students, (2) field and other elective courses, (3) workshops, and (4) dissertation work. In addition to the core courses, doctoral students take a minimum of nine other courses, including three courses in a field of specialization. The graduate economics program offers three fields of specialization: development and international economics; economic theory, history of economic thought, and methodology; and institutions (such as labor, financial, industrial, and public institutions). Students are alternatively allowed to tailor their own field clusters. Each of the field clusters offers a unique approach to the field that distinguishes the Notre Dame program from others. It is expected that after completing the course work, students will do their advanced study and research in one of the fields where Notre Dame and the faculty excel.

Master of Arts
Both a research and a nonresearch M.A. degree are available. The basic requirements for each are Economics 500, 501, 502, 508, and 591, a total of 30 credit hours, and successful completion of the M.A. comprehensive examinations covering macroeconomic theory, microeconomic theory, and political economy. For the research M.A., a thesis (which counts six credits toward a 30-credit-hour total) is required. The nonresearch M.A. entails 30 credit hours of regular course work, but no thesis requirement.

Doctor of Philosophy
The requirements for the Ph.D. are a minimum of 16 graduate courses, including seven core courses and a three-course field cluster requirement; successful completion of comprehensive examinations in macroeconomic theory, microeconomic theory, and political economy; a written dissertation; and fulfillment of University requirements with respect to grade point average and residency. The typical doctoral program takes four years, although it can be accomplished in less time, especially if the student has had some previous graduate work. Normally, students complete their course work within two years, write their comprehensive examinations at the end of the first year, participate in workshops, and in the third year develop and present a dissertation proposal. After a director and three readers have agreed to serve on the student’s dissertation committee, the student carries out the proposed research with their advice and guidance.
Special Features

The economics program is flexible enough to accommodate the needs and background of the individual student so that courses in a number of other areas can be added easily and logically.

In addition to regular seminars and workshops, the economics department sponsors lectures, seminars, round table discussions, and conferences with guest economists from around the world.

Other features of the program include a high faculty-student ratio, Macintosh computers, IBM PCs, and computer terminals throughout the campus area, and opportunities to utilize the services of the Laboratory for Social Research.

For further information about graduate study in economics, please write to the Director of Graduate Admissions, Department of Economics.

Course Descriptions

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week—laboratory or tutorial hours per week—credits per semester)
- Instructor
- Course Description

I. Required Graduate Courses

500. Mathematics for Economists
    (3-0-3) Lee, Mukhopadhyay
    Prerequisite: ECON 301, ECON 302, or equivalent, or permission of instructor. Mathematical methods used in economic theory and analysis. Major topics include differential and integral calculus and matrix algebra.

501. Macroeconomic Theory I
    (3-0-3) Dutt, Ros
    Prerequisite: ECON 302 or equivalent.
    An overview of alternative static macro models (such as Keynesian, monetarist, new classical, new Keynesian, and post-Keynesian models); microeconomic foundations of macroeconomics; an introduction to business cycles, growth, and open economy issues.

502. Microeconomic Theory I
    (3-0-3) Jensen, Mui, Rakowski
    Prerequisite: ECON 301 or equivalent.
    Mathematical presentation of neoclassical models of consumer behavior, behavior of the firm, and analysis of markets under perfect and imperfect competition. Analysis of market failures, choice under uncertainty, and the economics of information.

506. History of Economic Thought and Methodology
    (3-0-3) Mirowski, Sent
    Introduction to the history of economic thought and methodological issues in economics. Survey of preclassical, classical, Marxian, marginalist, and other approaches. Issues in the philosophy of science concerning explanation, verification, and prediction.

508. Political Economy
    (3-0-3) Mason, Ruccio, Wolfson
    Alternative approaches to political economy, including classical, Marxian (both classical and contemporary), post-Keynesian, institutional, feminist, and neoclassical approaches. Methods of analysis in these approaches are illustrated by examining the basic concepts of political economy such as class, state, gender, race, power, institutions, crisis, and development as well as concrete historical and contemporary issues.

591. Statistics
    (3-0-3) Lee, Marsh
    Exposition of statistical techniques with applications in development, labor theory, and public policy economics. Testing hypotheses in economic theory and estimating behavioral relationships in economics.

592. Econometrics I
    (3-0-3) Lee, Marsh
    Prerequisite: ECON 591, ECON 303, or equivalent statistics course.
    Properties of estimators, methods of estimation, general linear regression model, maximum likelihood estimation, nonlinear regression models, Karnaugh maps, hypotheses testing with likelihood ratio, Wald, Rao tests, ANOVA, and spline regression methods.

603. Macroeconomic Theory II
    (3-0-3) Dutt, Ros
    Prerequisite: ECON 501 or equivalent.
    Analysis of recent contributions and controversies in macroeconomic theory emphasizing alternative approaches such as new classical, new Keynesian, and post-Keynesian approaches. Macroeconomic dynamics involving the analysis of growth distribution and cycles.

II. Elective Graduate Courses

513. The Computer as Social Phenomenon
    (3-0-3) Mirowski
    This course takes the perspective of “science studies” and applies it to issues that do not fit easily into either computer science or economics. These include: Does the computer have a well-defined existence? How has the computer influenced our theories of human nature? Is the “new information economy” a real phenomenon? It also deals with some emerging issues in Internet commerce.

515. Economic Methodology
    (3-0-3) Mirowski, Ruccio, Sent
    Philosophy of science issues of explanation, verification, and prediction are used to critique neoclassical, Keynesian, Marxian, and other heterodox economic theories.

516. Problems in Political Economy
    (3-0-3) Dutt, Wolfson
    Alternative theories (institutionalist, Marxist, and post-Keynesian) and their application to researchable problems. Major emphasis on preparation for writing a dissertation using an alternative methodology.

517. Growth and Distribution Theory
    (3-0-3) Dutt
    Alternative theories of growth, income distribution, and prices from a theoretical point of view. It first considers simple macroeconomic theories of growth and income distribution. It then systematically examines money and inflation, technological change, sector issues, government activity, and open economy issues in terms of the alternative theoretical approaches. Students will be required to write a paper.

521. Monetary Economics
    (3-0-3) Bonello, Wolfson
    Major theoretical and empirical studies on the demand for and the supply of money, the impact of money in alternative macroeconomic models, and major topics in monetary policy.
522. Financial Institutions, Markets, and Instability
(3-0-3) Wolfson
An examination of the workings of the financial system. Topics include financial crises and the business cycle, institutional and structural change affecting financial markets and institutions, the global financial system, financial fragility, regulatory policy and financial restructuring, the political economy of central banking, and money and credit in the economy.

531. Theory of Public Finance
(3-0-3) Betson
The effects of public expenditure and taxation policies on resource allocation and income distribution.

541. Labor Institutions
(3-0-3) Ghilarducci
Wage and benefit determination under collective bargaining and the decline of union bargaining power, and labor market segmentation including dual labor market analysis and the labor process debate.

542. Labor Economic Theory
(3-0-3) Ghilarducci
Three paradigms in labor economic theory: neoclassical, radical, and institutional. Theories of time use, household formation, women’s employment, wage determination, efficiency wages, labor market dynamics, and unemployment are among the areas covered.

561. Development Economics
(3-0-3) Dutt, Ros, Ruccio
A general introduction to the field of development economics, with concentration initially on questions of a macrostrategic nature. The final topic is macroanalysis of country development programs, examining country studies, and macro models.

562. Research Methods and Policies of Development
(3-0-3) Kim
Research and planning methods applicable to development problems including project appraisal and computable development modeling. Case studies in Third World development.

564. International Finance
(3-0-3) Kim, Lee
Empirically based examination of exchange rate and balance of payments issues and the debt problem.

565. International Political Economy
(3-0-3) Mosley
This seminar explores the interaction between politics and economics in the international system, with an emphasis on the theoretical development of the subfield of international political economy. We will investigate the balance between cooperation and conflict, the effect of international institutions on economic relations, and the mutual impact of domestic and international politics. Throughout the course, we will consider how well models developed in other fields of political science or economics can be applied to international political economy. We will also attempt to identify the “state of the art” in the study of international political economy.

571. International Trade
(3-0-3) Dutt, Kim
Theoretical models and empirical analysis of international trade and factor movements. Alternative approaches to trade theory, including Hescher-Ohlin, models of imperfect competition, and nonorthodox approaches. Discussion of welfare issues, commercial policy, and regional integration.

572. Open Economy Macroeconomics
(3-0-3) Ros
Macroeconomic theory and policy in open economies. Balance of payments accounting, basic theory of fiscal and monetary policy under alternative exchange rate regimes, and recent developments in the area of exchange rate economics. Implications of the social issues for current policy issues in the areas of stabilization policies and international borrowing.

578. Political Economy Postindustrial Societies
(3-0-3) Messina
This course investigates the nexus between politics and economics in the postindustrial societies. After a brief discussion of the theoretical principles of economic liberalism, the course focuses on the impact of economic actors and conditions on politics and the political and economic consequences of the organization of the world economy along free market principles. It concludes by scrutinizing the relationship between domestic politics and the project for deeper economic integration in the case of the European Union.

5581. Industrial Organization
(3-0-3) Staff
Introduction to the study of industrial structures and their relationship to economic performance. Competing theories of the determinants of structure at the level of individual industries and sectors and the role of structure in the competitiveness of firms in the regional, national, and global economy. Role of competitive forces in relatively unregulated environments and role of regulation and industrial policy in creating successful industries.

593. Econometrics II
(3-0-3) Lee, Marsh, Mukhopadhyay
Prerequisite: ECON 592.
A survey course in practical, applied econometric techniques. Students learn how to make effective use of such techniques as spline regression, switching regressions, disequilibrium models, robust regression, nonlinear estimation, logit, probit, tobit, censoring, truncation, and event history analysis. Extensive computer applications.

594. Mathematical Economics
(3-0-3) Marsh, Rath
Linear algebra and the theory of linear programming: applications to the theory of the firm, production, and demand theory. Queueing theory; game theory, dynamic programming; and decision making under uncertainty.

595. Topics in Applied Econometrics
(3-0-3) Mukhopadhyay
Applications of econometric techniques to economic problems in the fields of micro, macro, and international economics.

596. Computing for Social Sciences
(0-1-1) Mukhopadhyay
A once-a-week lab course familiarizing students with statistical programs useful for social scientists.

596A. Computing for Social Science Research
(0-1-1) Staff
A lab course designed to introduce basic statistical techniques.

598. Special Studies
(V-V-V) Staff
Prerequisites: written consent of instructor. Independent study under the direction of a faculty member. Course requirements may include substantial writing as determined by the director. They will disenroll a student early for failure to meet course requirements. Students who have been disenrolled or who have failed at the end of the first semester are disqualified for Special Studies in the following term.
III. Graduate Seminars

612. Seminar in Methodology and the History of Economic Thought
(3-0-3) Mitrowski, Ruccio, Sent
Special topics in economic methodology and history of economic thought. Subject matter to vary from year to year.

614. Game Theory and Applications
(3-0-3) Rath
The objective is to develop the basic concepts of game theory and to apply them to understand strategic interactions in both market and nonmarket environments. Specific topics include subgame perfect equilibrium in repeated games, folk theorems, stick and carrot strategies, bargaining, incentive and mechanism design, signaling games, and strategic voting.

619. Seminar in Economic Theory
(3-0-3) Dutt, Rath
Special topics in economic theory. Subject matter to vary from year to year.

633. Seminar in Public Sector Economics
(3-0-3) Betson, Warlick
Special topics in public sector economics. Subject matter to vary from year to year.

643. Seminar in Labor Economics
(3-0-3) Ghilarducci
Special topics in labor economics. Subject matter to vary from year to year.

645, 646. Workshops in Institutions
(1-0-1) (1-0-1) Staff
A forum for students to present their current research in institutional economics (concerning labor, financial, industrial, and public institutions) and to discuss various papers and research of interest to the participants.

655, 666. Workshops in Development and International Economics
(1-0-1) (1-0-1) Staff
A forum for students to present their current research in development and international economics and to discuss various papers and research of interest to the participants.

675. Dissertation Workshop
(V-V-V) Staff

V. Other Graduate Courses

599. Thesis Direction
(V-V-V) Staff

695. Special Topics
(3-0-3) Staff
By arrangement with individual instructors. Regular letter grading with fixed 3.0 credit hours only.

697. Directed Readings
(V-V-V) Staff
By arrangement with individual instructors. Satisfactory/unsatisfactory grading with variable number of credit hours.

699. Research and Dissertation
(V-V-V) Staff
Research and dissertation for resident doctoral students.

700. Nonresident Dissertation Research
(0-0-1) Staff
Required of nonresident graduate students who are completing their dissertations in absentia and who wish to retain their degree status.

701. Graduate Seminar
(V-V-V) Staff
The objectives of the seminar are to acquaint future economics teachers with the growing literature in economics education; with the essential elements of educational theory that are applicable to economic instruction; and with the opportunity to improve their teaching technique.

673. Seminar in International Economics
(3-0-3) Dutt, Kim, Ros
Special topics in international trade and open economy macroeconomics. Subject matter to vary from year to year.

IV. Workshops

615, 616. Workshops in Economic Theory, History of Economic Thought and Methodology
(1-0-1) (1-0-1) Staff
A forum for students to present their current research in economic theory, history of economic thought, and methodology, and to discuss various papers and research of interest to the participants.

641. Seminar in Methodology
(1-0-1) (1-0-1) Staff
A forum for students to present their current research in economic methodology and to discuss various papers and research of interest to the participants.

645, 646. Workshops in Institutions
(1-0-1) (1-0-1) Staff
A forum for students to present their current research in institutional economics (concerning labor, financial, industrial, and public institutions) and to discuss various papers and research of interest to the participants.

702. Graduate Practicum
(V-V-V) Staff
This course is designed to provide practical teaching advice and experiences for those graduate students who plan to teach at the university level, either after they complete their degree or as a teaching assistant here at the University. The issues covered in this course include: establishing explicit teaching objectives, preparing a course syllabus, teaching in various classroom settings—small lecture courses to large or even jumbo-sized lecture courses, seminars, reading courses, and independent research/study—adjusting to special student needs, assessing student learning, gender/ethnic concerns, using educational technologies, out-of-classroom student contact, and balancing research and teaching demands.

Each class participant will be expected to develop a course syllabus, prepare some student assessment instruments, draft lecture material, and conduct a minimum of three live lecture/discussions that will be video taped and evaluated. The video taped sessions will be the centerpiece of this seminar. There will be no text, but each participant will be expected to purchase at least three high-quality videotapes. (Educational Media of the Office of Information Technology will determine the tape specifications.) These tapes will remain the property of the seminar participant.

All graduate students who currently serve as teaching assistants, or plan to serve as teaching assistants in the near future, are expected to enroll in this seminar one time.

VI. Upper-Level Undergraduate Courses and Graduate Courses in Other Departments

In addition to the regular graduate courses listed above, certain undergraduate economics courses are available to graduate students. Up to 10 such credit hours may be counted for the M.A. or for the Ph.D. These are courses at the 400 level and require the permission of the student’s adviser and the Director of Graduate Studies to qualify for graduate credit. Similar approval is needed for graduate-level courses offered by other departments.

Faculty

REV. ERNEST J. BARTELL, C.S.C.,

FRANK J. BONELLO, Associate Professor. B.S., Univ. of Detroit, 1961; M.A., ibid., 1963; Ph.D., Michigan State Univ., 1968. (1968)


REV. MARK J. FITZGERALD, C.S.C., Professor Emeritus. A.B., Univ. of Notre Dame, 1928; M.B.A., Harvard Univ., 1931; Ph.D., Univ. of Chicago, 1950. (1940)

TERESA GHIILARUCCI, Associate Professor. A.B., Univ. of California, Berkeley, 1978; Ph.D., ibid., 1984. (1983)


RICHARD A. JENSEN, Chair and Professor. B.A., University of Kansas, 1971; Ph.D., Northwestern University, 1980. (2000)


VAI-LAM MUI, Associate Professor. B.Sc., Chinese Univ. of Hong Kong, 1984; Ph.D., Univ. of California at Berkeley, 1992. (1999)


JAMES J. RAKOWSKI, Associate Professor. B.A., Creighton Univ., 1963; Ph.D., Univ. of Minnesota, 1968. (1967)


JAIME ROS, Professor. B.A., Univ. of Paris XII, 1971; M.A., National Univ. of Mexico (UNAM), 1974; Diploma in Econ., Cambridge Univ., 1978. (1990)

DAVID F. RUCCIO, Associate Professor. B.A., Bowdoin College, 1976; Ph.D., Univ. of Massachusetts at Amherst, 1984. (1982)

ESTHER-MIRJAM SENT, Associate Professor. Doctorandus, Univ. of Amsterdam, 1989; Ph.D., Stanford Univ., 1994. (1994)

ROGER B. SKURSKI, Professor. B.S., Cornell Univ., 1964; M.S., Univ. of Wisconsin, 1967; Ph.D., ibid., 1970. (1968)


CHARLES K. WILBER, Professor Emeritus. B.A., Univ. of Portland, 1957; M.S., ibid., 1960; Ph.D., Univ. of Maryland, 1966. (1975)

The Program of Studies
The primary aim of the graduate program in government and international studies is to train qualified candidates for research and teaching. Some students also plan to do administrative work in domestic and international politics. The department offers M.A. and Ph.D. degrees. It has four major subfields:

1. Political theory
2. Comparative politics
3. International relations
4. American government and politics (including public law)

The department has faculty with a wide range of interests. Its particular strengths include political theory; democratic institutions; ethnicity, religion, and nationalism; political economy; international humanitarian issues, and peace studies; Latin American politics; regime change; political participation; politics and literature; and constitutional studies. The highly selective student body is drawn from a large pool of applicants from many countries: in 2001 we had 220 applicants for 13 openings. The department’s community of graduate students is marked by a diversity of interests, backgrounds, and nationalities. The small size of the graduate program facilitates close interaction between faculty and students and allows us to offer financial assistance to virtually all students whom we admit.

In recent years, 80 percent of Notre Dame Ph.D. recipients in government have been appointed to full-time teaching and research positions. Recent appointments of Notre Dame Ph.D.s in government include tenure-track positions at research universities (e.g., the University of Pennsylvania, the University of Pittsburgh, Florida State, Purdue, Florida International University, Oklahoma, Louisiana State University, Pepperdine, SUNY-Stony Brook) and at renowned liberal arts colleges (e.g., Bowdoin, Connecticut College, Bates, Whitman). Students in the department have fared well in winning prestigious fellowships and prizes, including the Edwin Corwin Award of the American Political Science Association for the best dissertation in public law and the Leo Strauss Award for the best dissertation in political theory.

The faculty is strong, and it is growing and changing. The department currently has 39 faculty members, including scholars of national and international recognition.

M.A. students must complete a minimum of 30 hours in course credits and must pass a comprehensive written examination in...
their major field. A minimum of 12 hours of course work is required in the major field, and a minimum of nine in a second field. However, M.A. students are not eligible for funding, and we rarely offer admission to those seeking only the M.A.

**Doctoral Program**

Ph.D. students must complete the following requirements:

1. A total of 60 credit hours of courses, including at least 48 credit hours of substantive courses;
2. At least 12 hours of courses and comprehensive written exams in two of the department’s four subfields (American government, comparative politics, international relations, and political theory);
3. At least nine hours of course credits in an area of specialization;
4. A proseminar and a quantitative methods course;
5. A reading exam in one foreign language;
6. A master’s paper;
7. An oral examination, based on the student’s dissertation proposal;

Students in the department are advised to consult the listing of courses in other departments, particularly in sociology, economics, history, philosophy, and theology. Courses in other departments selected in consultation with the student’s adviser are counted toward a degree.

**Institutes**

Two major research institutes at Notre Dame are closely related to the department: the Kellogg Institute for International Studies and the Kroc Institute for International Peace Studies. The Kellogg Institute was established to promote advanced study, teaching, and research on international problems, especially of developing countries. Research questions of Kellogg are generally grounded in the democratization and development experiences of Latin American countries, but related research on other regions is also welcome. The Kroc Institute conducts research, teaching, and public education on war prevention and global security, the promotion of human rights and justice, and international protection of the ecosystem. It also offers a multidisciplinary master’s degree in peace studies.

Many of the department’s faculty are also fellows of the institutes. Graduate students benefit from seminars, visiting scholars, grants to initiate dissertations, dissertation-year fellowships, and ongoing research projects of the institutes.

The department also makes substantial use of the Laboratory for Social Research. The lab provides consulting in statistical analysis and computer applications and serves as the repository for data from the Inter-University Consortium for Political and Social Research and other archives.

**Course Descriptions**

The following list includes courses offered during the last three academic years by current faculty members. Some courses are offered on an annual basis, and many others are offered less frequently. Because this list is restricted to the past three academic years, it is not exhaustive. Students should also consult the list of courses in other departments.

Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–
laboratory or tutorial hours per week–
credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

### 501. Introduction to Quantitative Methods

(3-0-3) Wolbrecth

This course is an introduction to the use of statistical methodology in the social sciences; it is not a course on statistics. The class emphasizes the role of statistics as a tool, rather than an end in itself. While we learn a variety of statistical techniques, the focus is upon the logic of these techniques rather than their mathematical intricacies. There will be a series of exercises and exams, coupled with a major project in which students will be required to gather and analyze data on an empirical problem of their choice. Graduate students only.

### 502. Proseminar

(3-0-3) Coppendge, Gould

This course has several diverse objectives. First, it serves as an introduction to political science as a profession. Second, it addresses the nature of political science as a discipline, examining its history and prospects. Under this rubric we survey the scope of the discipline, examining both (a) the several substantive fields and, more importantly, (b) comparing theoretical and meta-

### 605. Advanced Quantitative Methods

(3-0-3) Sanders

Quantitative methods are often used to understand the behavior and interactions of individuals, governments, and nations. This course is designed to provide students with an understanding of the quantitative tools that are useful for doing quantitative political research. We will begin by reviewing the basics of statistical inference and the linear regression model, with a thorough discussion of the problems that arise in regression analysis and the solutions to those problems. The bulk of the course will be devoted to the following topics:

- extensions to the basic regression model: simultaneous equations and time-series/cross-sectional models.
- maximum-likelihood techniques for modeling categorical dependent variables: logit/probit, ordered logit/probit, multinomial logit/probit, and count models
- models for dealing with sample selection bias: tobit and Heckman models.
- techniques for modeling time-series data.

Throughout, we will focus on understanding the theoretical underpinnings of the model and developing and evaluating applications of the models to substantive problems in political science. Students will be asked to do data-analysis exercises, to evaluate published research relying on quantitative techniques, and to do a research project on a topic of their own choosing.

### American

#### 513. Religion and the Constitution

(3-0-3) Barber

Does constitutionalism in America presuppose a supreme being? Does the maintenance of constitutional institutions depend on the prevalence of religious or specifically Christian faith and morals? To what extent can or should constitutional government accommodate religious beliefs, institutions, and practices? Is constitutionalism in America on a collision course with the religious commitments of a substantial portion of the American people? This seminar will explore these and related issues. Readings include classical writers such as Locke and Jefferson, contemporary scholars...
and social critics such as Stanley Fish and Richard John Neuhaus, and leading decisions of the U.S. Supreme Court. Courses are open to graduate students and law students. Space may be available to a few seniors who have instructors' permission. Course grade will be based on a term paper, class participation, and assigned oral reports.

514. Political Parties and Interest Groups (3-0-3) Wolbrecht
In the United States, as in most democracies, political parties and interest groups are central mediating institutions linking citizens and the political decision makers who govern them. In an effort to understand the role of political parties and interest organizations in the American political system, we will examine issues of historical development, membership, organization, tactics, competition, and representation, among others. While the primary focus is the American case, the questions and concepts addressed in this course are applicable to other democratic systems.

520. Congress and Foreign Policy (3-0-3) Roos
This course will have two goals: to give the student a working knowledge of the U.S. Congress and the basic literatures surrounding it, and to then examine in depth the history and scholarship of its involvement with foreign policy. The first half of the course will concentrate on the Congress generally, looking at such authors as Mayhew, Fenno, Lowi, and Sundquist. The second half will look at a number of particular topics in foreign policy such as international organizations, intelligence oversight, foreign aid, nuclear policy, Latin America, and Africa.

539. The American Founding (3-0-3) M. Zuckert
This seminar centers on James Madison’s Notes of the proceedings in the constitutional convention, but attempts to view the thoughts and deeds of the delegates in the broader context of the American Revolution and the American experience in the decade between the start of the revolution and the drafting of the Constitution on the one hand, and of broader developments in political philosophy (e.g., the all-important thought of Montesquieu) on the other. Each student will prepare a research paper explaining a theme related to the course materials.

542. The Presidency: Institution and Performance (3-0-3) Arnold
This course develops a two-part perspective on the U.S. presidency, examining its institutional development while assessing the leadership behavior of incumbents within it. Readings will survey conceptual strategies for understanding institutional development and leadership performance. Students will write brief, critical essays on readings that will focus class discussion. Additionally, students will prepare research papers using a case or data-base to assess the utility of one conceptual approach for understanding presidential leadership.

553. Completing the Constitution: The Post-Civil War Amendments (3-0-3) M. Zuckert
This seminar will explore the thesis that the post-Civil War amendments to the Constitution (the 13th, 14th, and 15th) are best understood as efforts to “complete the Constitution,” that is, to carry through the logic of the original founders where they stopped short for various reasons. The center of the seminar are the Congressional debates on the various amendments and related civil rights legislation. Each student will prepare a research paper exploring a theme related to the course materials.

554. Seminar on the Supreme Court (3-0-3) Kommers
This seminar examines the politics and process of decision making in the United States Supreme Court. It covers the Court’s organization, jurisdiction, and procedures, the nomination and confirmation of justices, the role of law clerks and advocates, and outside influences on the Court’s personnel. The seminar also includes major units on the Court’s exercise of its discretionary jurisdiction, the setting of the Court’s agenda, oral argument and the opinion-writing process, the impact of Supreme Court decisions, and judicial-legislative relationships. Lastly, and importantly, the seminar explores various methods and approaches to the study of judicial decision making. Grades will be based on a term paper, class participation, and oral reports.

557. American Subnational Politics and Government (3-0-3) Hero
The purpose of this seminar is to provide a careful and extensive overview of the scholarly issues and literature concerning American “subnational,” especially state, politics. The assumption and approach taken is that state and local governments in the United States are important in and of themselves, but they are also critical in how they shape national politics and governance through their own political and policy patterns and in their implementation of “national” domestic policies. Three bodies of literature will be the focus of analysis: U.S. federalism and intergovernmental relations; state governance, politics and public policy; and urban/local politics (with the most extensive attention given to the second of the three).

In general, the approach will be comparative while at the same time giving close attention to historical and contemporary theoretical and analytical debates in the field. Moreover, there will be considerable attention to the significance of subnational politics for understanding the U.S. political system in general, as well as the approaches to studying that system.

615. Field Seminar in American Politics (3-0-3) Wolbrecht
This is the “core” seminar in American politics, designed to provide a survey of the most important literature in the field. The seminar is intended to present the student with a broad, eclectic view of the current state of the literature in American politics. The readings attempt to provide a sampling of classic and recent theory and substance in the hope of suggesting where scholars stand, and where they seem to be headed, with respect to some major topics in the American subfield.

Comparative

506. State Building and Regime Change (3-0-3) Gould
In this seminar we will discuss classic and contemporary works on questions of state-building and regime change in the modern world. State-building and regime change constitute two distinct yet interrelated outcomes that are perennially at the top of research agendas in political science and sociology. Why and how do bureaucracies develop? What are the differences in the organizational infrastructure of various states and why do these differences emerge? Why do different political regimes emerge? What accounts for transitions from one type of regime to another? While there are many possible ways of structuring a look at the broad body of research seeking to answer these questions, this course adopts a threefold division in its presentation: we will examine, in turn, explanations that
focus on rationality, culture, and structure. We will also examine renewed attention to modernization theories and to political-economic.

536. 635. Theoretical Approaches in Comparative Politics
(3-0-3) (3-0-3) Hagopian, Mainwaring
This course has two objectives. First and foremost, it provides an overview of major theoretical approaches to comparative politics. We will examine structural approaches, contingent action arguments, institutionalism, rational choice, political culture, and eclectic approaches. We will also spend one week discussing international influences on domestic politics.

An important secondary objective is to provide some awareness of comparative methods in political science. Toward this objective, we will begin the semester with some readings on methods in comparative politics, and we will discuss methods of inquiry throughout the semester.

568. Democracy and Markets in Latin America
(3-0-3) Hagopian
This course examines the two most significant changes in Latin American politics in the latter part of the 20th century: the consolidation of democratic political regimes and the transition to an economic order in which market forces play a predominant role in the allocation of resources. It begins by introducing contending theoretical perspectives on the ways in which these political and economic transitions take place and the extent to which they are mutually reinforcing or constraining. It then analyzes the roles of various political and social actors and institutions in the processes of democratization and economic liberalization. Specifically, the focus is on the changing foundations of citizen association and participation, channels of political representation, and political institutions that shape and constrain the trajectories of democratic consolidation and state- and market-oriented reform.

575. Comparative Research on Democratization
(3-0-3) Coppedge, Mainwaring
Pre requisite: GOVT 500 or 501.
This course is both a survey of major works seeking to explain the birth and survival of democracy, and a research seminar that allows students to explore these topics on their own and as members of a research team. Discussions will examine how leading political scientists have dealt with the major issues of research design; lectures will provide user-friendly introductions to a variety of analytic techniques; and research assignments will encourage hands-on experience with data collection, measurement, and statistical analysis. Graduate students only.

578. The Political Economy of Postindustrial Societies
(3-0-3) Messina
This course investigates the nexus between politics and economics in the postindustrial societies. After a brief discussion of the theoretical principles of economic liberalism, the course focuses on the impact of economic actors and conditions on politics and the political and economic consequences of the organization of the world economy along free market principles. It concludes by scrutinizing the relationship between domestic politics and the project for deeper economic integration in the case of the European Union.

579. Comparing Democracies
(3-0-3) Coppedge
This is a seminar on the nature and consequences of democracy. It is a companion course to GOVT 575, “Comparative Research on Democratization,” which examines causes of democracy. However, neither seminar is a prerequisite for the other. “Comparing Democracies” is a semester-long workshop devoted to establishing rigorous criteria for evaluating how democratic “democracies” are and what difference it makes. We will read and discuss selected theoretical works that propose definitions of and justifications for democracy. We will break down the concepts into measurable components and function as a research team to produce qualitative and quantitative indicators of the quality of democracy. Students will also present and critique their own research on the consequences of these qualities of democracy for regime stability, social equity, or other outcomes. The seminar includes practical instruction on concept formation, measurement theory, dimensional analysis, and other methodological tools that would be useful for analyzing many complex political phenomena besides democracy.

630. Comparative Constitutional Law
(3-0-3) Kommers
This seminar introduces graduate students and law students to the developing field of comparative constitutional law and constitutionalism. Leading American constitutional cases in topical areas such as church-state relations, freedom of speech, right to life issues (abortion, death penalty, and assisted suicide), political representation, gender and racial discrimination, and social and economic rights will be compared with similar cases handed down by Canada’s Supreme Court, Germany’s Federal Constitutional Court, and the European Court of Human Rights. Selected cases are also drawn from the Hungarian, Indian, and South African Constitutional Courts. The seminar’s task is threefold: to identify the similarities and differences in the reasoning and outcomes of the cases, to explain these differences and similarities, and then to discuss aspects of American constitutional law in the light of the foreign materials. In addition, the seminar will consider and identify the uses that particular courts have made of comparative analysis in deciding questions arising under their respective constitutions. Graduate students with a background in political theory, comparative government, or constitutional law should find the seminar informative and intellectually challenging. Grades are based on oral reports, general participation, and a term paper that assesses some aspect of American constitutional law in the light of foreign constitutional developments.

641. Comparative Parties and Party Systems
(3-0-3) Mainwaring
This course will focus on comparative parties and party systems. The major purpose is to acquaint students with some of the most important theoretical and comparative literature on one of the major themes in political science.

The course has three main units. We will begin with some general reflections on why
parties matter. In Part I, we will also examine the literature on the decline of parties and the rise of other vehicles of representation.

In Part II, we will discuss three leading theoretical approaches to the analysis of why different party systems emerge in different nations. In particular, we will discuss authors who emphasize social cleavages, voters' preferences (the spatial model), and electoral systems as factors shaping party systems.

Part III of the course focuses on parties rather than party systems as the unit of analysis. A fundamental question is the way parties function internally. To what extent can parties be seen as rational actors as opposed to organizations with logics that may not follow the normal dictates of rationality? More broadly, what shapes how parties compete and function?

654. The Politics of Tropical and Southern Africa
(3-0-3) Walhe
At first the course will concentrate on tropical Africa: traditional political systems, the impact of colonialism, the rise of African nationalism, political independence and its aftermath—the phenomenon of military/bureaucratic states and the search for legitimate forms of government. The focus shifts for the second half of the semester: the rise of Afrikaner nationalism, the consolidation of the apartheid state, black protests and the liberation movement, the Frontline States, and the U.S. policy towards the region. There will be two examinations. Students who wish to write a research paper should think in terms of signing up for “Special Studies” in a subsequent semester.

668. Political Culture and Political Change
(3-0-3) Moody
This seminar will examine ways in which the concepts of culture and political culture have been used in the study of politics, with a view toward seeing whether the concepts are useful and give insights. It will examine various criticisms of the concepts and the ways they have been used.

681. Democracy and Democratic Theory
(3-0-3) O’Donnell
This seminar will explore and discuss what to my mind are the main meanings, conundrums, and predicaments of democratic theory and practice since its origins until today. Active participation in class, two written reports on selected readings per each student, and an option between a research paper or a take-home exam will be expected.

International Relations
545, 667. American Foreign Policy
(3-0-3) (3-0-3) Lindley
This course examines in detail theories about American foreign policy ranging from structural, state-level policy process, to decision making theories. We will also review the history of American foreign policy and assess several prominent policy problems currently facing decision makers. We will work extensively on formulating, critiquing, and testing theories, with a focus on case-study methodology. Book/article reviews and a major research paper are required. Students will lead class at times, will present their own work, and will participate in debates. Qualified undergraduates may take the course with permission.

546. Classic Theory and Contemporary Trends in International Politics
(3-0-3) Dowry
This course covers in some depth “classic” theories of international politics, from pre-modern thinkers through realism and more recent approaches. The emphasis is on the content of these theories rather than on methodological issues or empirical research; classic and contemporary theory will be examined in its treatment of current issues such as increased interdependence and the development of international norms and enforcement. Readings include such thinkers as Thucydides, Rousseau, Kant, Carr, Morgenthau, Waltz, Gilpin, and Keohane, as well as more recent “classics,” with a focus on works represented in the reading list for the international relations comprehensive examination.

552. International Political Economy
(3-0-3) Mosley
This seminar explores the interaction between politics and economics in the international system, with an emphasis on the theoretical development of the subfield of international political economy. We will investigate the balance between cooperation and conflict, the effect of international institutions on economic relations, and the mutual impact of domestic and international politics. Throughout the course, we will consider how well models developed in other fields of political science or economics can be applied to international political economy. We also will attempt to identify the “state of the art” in the study of international political economy.

This course is intended to prepare students for the IPE component of the preliminary exams in international relations, and to lay the groundwork for future research in the fields of international political economy, international relations, and comparative political economy. The course also is open (with the instructor’s permission) to undergraduate students who would like a more theoretically oriented exploration of international political economy.

565. The International Political Economy of Money and Finance
(3-0-3) Mosley
This seminar examines recent theoretical issues and empirical research in the areas of international financial and monetary relations. We explore the political determinants and implications of international financial flows as well as institutions that regulate the international financial system. We also investigate the historical development and political foundations of monetary arrangements including the Gold Standard, the Bretton Woods system, and the current regime of flexible exchange rates. This course also is open to advanced undergraduates who have taken GOVT 330 (IPE) and would like to spend more time exploring the issues of money and finance.

574, 669. International Relations of Latin America
(3-0-3) (3-0-3) Francis
The semester will begin with a historical review of 20th-century international relations within the hemisphere. A number of specific topics will be analyzed such as the impact of the growth of democracy, pressures toward free market economics and the significance of this trend, the progress of various economic integration experiments, the role of sanctions and intervention, and the importance of such issues as drugs and immigration. Various theoretical approaches to understanding the workings of the hemispheric international system will be discussed. Each student will be expected to do two short class presentations accompanied by short papers and a longer study of the foreign policy of a particular Latin American country.

582. Peace and World Order I
(3-0-3) Johansen
This course examines various ways of understanding the causes and dynamics of inequality and collective violence in
Students explore opportunities for and impediments to implementing their own preferred visions of future world order.

585. International Organization (3-0-3) Staff
International organizations (IOs) and institutions are pervasive in international relations. IOs can facilitate cooperation as well as institutionalize competition and conflict, including warfare. This course will examine the origins, roles, and prospects for IOs, with an emphasis on understanding change in intergovernmental organizations such as the UN system and regional organizations. Each student will present a briefing on a selected IO and write a research paper on some aspect of IO politics.

588. The United Nations and the Maintenance of International Peace and Security (3-0-3) Johansen
Students will examine (1) the theory and practice of United Nations peacemaking, peacekeeping, and enforcement; (2) proposals for strengthening UN capabilities in these areas; and (3) the prospects for employing the UN more effectively to reduce the role of military power in the world system.

589/671. Arab/Israeli Conflict (3-0-3) Dowty
This course will focus on the historical development of the Arab-Israeli conflict and current issues of that conflict on both the Israeli-Palestinian and interstate (Israeli-Arab) dimensions. Class participation will be emphasized; course requirements include a take-home exam over background material and a substantial research paper.

642. The Political Economy of International Institutions (3-0-3) Mosley
This seminar addresses the formation and functioning of international institutions from a rational-choice perspective. We consider the ways in which theories developed in other branches of political economy—including collective action and path dependence—can be employed to understand international institutions. Under what conditions do international institutions influence state behavior? What are the conditions that facilitate change in international institutions? What is the relationship between ideas and interests in international relations theory?
emergencies in the developing countries and in Europe and how these issues are dealt with by organizations.

Theory

521. Medieval Political Theory
(3-0-3) Roos
This course is aimed at introducing students to some of the main elements of political theory in the Middle Ages. It will use one survey book, but its main concentration will be a more intensive investigation of the thought of Thomas Aquinas and Augustine. The course will pay special attention to the conception of nature in Aquinas, and the relationship between nature and grace, politics and salvation, contemplation and action, and virtue and law.

521. Medieval Political Theory: Thomas Aquinas
(3-0-3) Keys
This seminar in medieval thought will focus on the politicaly relevant writings of Thomas Aquinas. Special attention will be given to the interplay between faith and reason, and between ethics and politics, in his work. Our aim will not be solely to gain a historical grasp of one of the great thinkers of the past, but also and especially to examine what relevance the problems he tackled and the approaches he proposed might have for us today. We will read selections from Aquinas’s commentaries on Aristotle’s Nicomachean Ethics and Politics; the Summa Theologiae on political authority and government, justice, prudence, and law; and the De Regno (On Kingship). Students will also gain familiarity with contemporary secondary literature and debate regarding aspects of Aquinas’s ethical and political thought.

522. Nature and Modern Democracy
(3-0-3) Nicgorski
From 1951 to 1953, the University of Chicago Press published three sets of the Walgreen Lectures dealing with the intellectual basis of various 20th-century challenges to democracy. These three books—Yves Simon’s Philosophy of Democratic Government, Leo Strauss’s Natural Right and History, and Eric Voegelin’s The New Science of Politics—have functioned to outline three highly influential and overlapping approaches to defining the crises of modern democracy and to restoring viable democratic foundations. This seminar-style course focuses on the reading and discussion of these books. Special attention is given to the concepts of history, science, nature, modernity, and democracy itself as they appear in the three works and in related writings.

531. Cicero and the Romans
(3-0-3) Nicgorski
This course offers the opportunity to study major issues in political theory, moral philosophy, and jurisprudence as they appear in the writings of Cicero and in the teachings of the philosophical schools of ancient Rome. Lucretius is also read. Topics considered include the relation of practice and theory, the virtues and expediency, the basis of right and law, and the natures of republican and mixed constitutions. Above all the course provides an opportunity for reading and discussing some of Cicero’s most significant writings. Cicero’s skepticism and his metaphysical and theological views come to attention in certain of the readings. Cicero, a leading statesman of the late Roman Republic, endeavored to mediate between the work of Greek theorists and Roman practice; in time, his writings became among the most important sources on ancient moral and political thought for the Christian tradition. His acknowledged influence on American founders such as Thomas Jefferson was much greater than that of Plato or Aristotle.

532. Plato’s Laws
(3-0-3) C. Zuckert
In his last and longest dialogue, Plato explored the nature and limitations of the rule of law. What are its sources—intellectual and emotional? Must the laws have or at least be believed to have a divine foundation? How can people be persuaded freely to obey? What set of laws and institutions would be best and why? Plato’s Laws contains the first explication and analysis of the “mixed regime” that is transformed by later, modern theorists into the “separation of powers” and “checks and balances” of the American Constitution. Plato himself seems to think that a regime that attempts to form the character of its citizens would be preferable. We will investigate the reasons why. Students will be required to lead a discussion of part of the text and to write a long seminar paper.

533. Plato’s Trilogy
(3-0-3) C. Zuckert
In this seminar we will explore the significance of the differences in the philosophical positions, political teachings, and pedagogical styles Plato presents in Socrates (especially the Theaetetus) and the Eleatic Stranger (in the Sophist and Statesman). Students will be asked to write a major interpretive study as well as a critique of a recent critical work.

534. Aristotle
(3-0-3) Goerner
A basic introduction to Aristotle’s “human philosophy” (ta anthropina philosophia) by reading the Nicomachean Ethics and the Politics. The aim of the course: obtain a critical understanding of the main substantive structure of Aristotle’s theory of excellence in personal and political practice as well as of the method used in presenting the theory. The course will be conducted in seminar style: participants will be expected to take turns presenting short, tightly argued introductions to key passages with a view to focusing discussion on the principal interpretive and theoretical questions posed by the particular text under discussion. Each seminar participant is also expected to write a critical research paper adjudicating a disagreement in the relevant, current, scholarly literature (usually two articles) on some issue in Aristotle’s ethico-political theory.

535. Hegel
(3-0-3) Staff
The seminar examines the political philosophy of Hegel. As a critic of both the modern liberal state and the 18th- and 19th-century romantic reactions to it, Hegel attempted to construct a political philosophy which could make sense of these competing models of the state and ultimately posit the beginnings of their overcoming and synthesis. We will study Hegel’s theories of the state, politics, society, and history with attention to their development from his early writings to his mature work. Students will be expected to write one substantial paper on some aspect of Hegel’s thought and will be responsible for critical presentations of the readings.

537. Social Contract
(3-0-3) Goerner
The seminar reads one or more works by a major social contact theorist. (In recent years the seminar has treated one of the following: Hobbes, Locke, Rousseau, and Rawls). The aim is to achieve a critical understanding of the theorist’s teaching on the relationships of individual, social, and political life. Participants are expected to take turns presenting short, tightly argued introductions to key passages with a view to focusing discussion on the principle interpretive and theoretical questions posed by the particular text under discussion. Each seminar participant is also expected to write
a critical research paper adjudicating a
disagreement in the relevant scholarly
literature (usually two articles) on some
issue.

552. Rawls
(3-0-3) M. Zuckert
John Rawls has undoubtedly been the most
significant theorist of the liberal tradition in
the late 20th century, and this seminar will
explore the body of his work, including his
early doctoral dissertation, through his A
Theory of Justice and his late Political
Liberalism. The guiding questions will be:
(1) that of Rawls’s development—how are
we to understand the various phases of his
thought; (2) that of Rawls as a philosopher
of liberalism—does Rawls present a
plausible and attractive version of liberalism;
and (3) that of the inherent truth and value
of Rawls’s theory.

566. Democratic Theory and
Multiculturalism
(3-0-3) Dallmayr
We live increasingly in a multicultural
world. But is this trend compatible with
democracy? In recent decades, democratic
theory has become a field between “liberals” and “communitarians.” In both
camps, multiculturalism is problematic.
Liberals give primacy to autonomous
individuals, outside cultural contexts.
Communitarians stress community values,
neglecting the multiplicity of cultural and
religious values. The seminar explores the
possibility of a multicultural democracy,
beyond liberal detachment and
communitarian parochialism. Starting from
the liberal-communitarian debate, the
seminar proceeds to a discussion of
multicultural democracy both on the
domestic level and on that of “cosmopolitan
democracy.” Some of the texts used are
Charles Taylor’s Multiculturalism, Bhikhu
Parekh’s Rethinking Multiculturalism, Iris
M. Young’s Inclusion and Democracy, Seyla
Benhabib’s Democracy and Difference, and
David Held and Archibugi’s Cosmopolitan
Democracy.

567. Theories of Modernity
(3-0-3) Dallmayr
“Modernity” today is a contested concept,
embroiled in multiple and often conflicting
interpretations. For some, modernity is the
highway to social progress, the advancement
of knowledge, and human liberation. For
others, modernity is an aberration, a
deviation from the path charted in ancient
and medieval times—an aberration manifest
in the “crisis of modernity.” Still others view
modernity as deficient but salvageable, or
else as exhausted and obsolete (to be
replaced by postmodernity). In our age or
globalization, modernity also plays a crucial
role in debates about Western colonialism
and hegemony. The seminar seeks to chart a
course through these debates. Beginning
with a survey of some social science
literature on modernity and modernization,
the seminar turns to Jurgen Habermas’s
defense of modernity (as an “unfinished
project”) and to Charles Taylor’s qualified
defense. Discussion then shifts to critics of
modernity, from Strauss, Voegelin, and
MacIntyre to Adorno and Derrida. Some
attention will also be given to non-Western
critics of “Western” modernity. Some texts
for the seminar are: Jurgen Habermas, The
Philosophical Discourse of Modernity; M.
Passerin d’Entreves and Seyla Benhabib,
Habermas and the Unfinished Project of
Modernity; Charles Taylor, A Catholic
Modernity; Anthony Giddens, The
Consequences of Modernity; and Gary
Gutting, Pragmatic Liberalism and The
Critique of Modernity. Selective reference
will also be made to Agnes Heller, A Theory
of Modernity; Eric Voegelin, Modernity
Without Restraint; Alasdair MacIntyre, After
Virtue; Hans Blumenberg, The Legitimacy of
the Modern Age; and Scott Lasch, Another
Modernity.

587. Global Human Rights
(3-0-3) Dallmayr
We live in an age of rapid globalization.
Part of this globalizing process is the
extension of the idea of “human rights” to
societies around the globe. Rooted in
modern Protestant and Enlightenment
principles, the idea of human rights forms
part not only of globalization, but also of
the worldwide drive toward democratization
and human emancipation. Although
enjoying widespread and deserved
popularity, human rights discourse is also enmeshed
in difficult theoretical or philosophical
quandaries. The seminar will review three
main question areas. (1) Question of
grounding: What is the source of human
rights? To what extent can rights be
justified, or what is the “rightness” of
human rights? (2) Question of universality:
Is the idea of human rights peculiarly
Western (tied to Western modernity)? How
can the idea be defended against charges of
ethnocentrism and such counter-ideas a
“Asian” or “Islamic” values? (3) Question of
application: If one admits the universality of
human rights, can such rights only be
exercised by subjects against their own
government, or can they also be pressed
against hegemonic superpowers oppressively
intervening in other societies? Can they be
marshalled against multinational conglomerates
and the effects of global capital
capital speculation? And what about the
destruction of natural resources (such as
rainforests) and the survival rights of native
communities? Students are expected to
participate actively in class discussions, to
write a research paper related to the topic of
the seminar.

594. Nature, Grace, History
(3-0-3) Roos
This seminar will explore several interrelated
themes concerning the relationship between
religious belief and politics. It will
critically compare several authors on a
variety of questions including the status of
politics, its natural versus conventional
status, whether religion is understood as
natural theology or divine particular
providence, whether reason and revelation
can conflict, toleration of other religions,
and what claims are made about the role of
revealed religion in establishing political
obligation. Readings will include parts of
Plato’s Laws, Augustine’s City of God,
Aquinas’s Summa Theologica, Maimonides’
Guide of the Perplexed, Alfarabi’s Plato’s
Laws, John Calvin’s Institutes of the
Christian Religion, and selections from
Martin Luther. Requirements will include
two five-page seminar papers, four one-page
commentaries, and a 20-page term paper
due at the end of the semester.

596. Machiavelli and Shakespeare
(3-0-3) M. Zuckert
This seminar will explore the relations
between these two great writers; the central
hypothesis is that Shakespeare was a deeply
political artist, akin to, if not quite a
political philosopher, whose works reveal an
almost obsessive concern with the texts and
themes of Machiavelli. We will proceed by
reading texts that seem to be in dialogue
with each other; examples include The
Prince on founders along with A Midsummer
Night’s Dream; Machiavelli’s comedy,
Mandrake along with Shakespeare’s The
Rape of Lucrece, both versions of the story of
the Roman matron Lucretia; Machiavelli’s
Discourses on Livy and Shakespeare’s
Coriolanus and Julius Caesar on the early
and late days of the Roman republic;
Machiavelli on the conquest of Fortuna,
along with Macbeth.
In recent years there has been much debate concerning Heidegger’s politics; heated controversy surrounds his involvement with fascism during the 1930s. According to some, this involvement completely tarnishes and invalidates his philosophical work; according to others, his philosophy can be completely separated from his politics. Behind this controversy, larger more basic issues loom: what is the relation between philosophy (including political philosophy) and politics, between theory and practice? Can philosophy provide guidelines or blueprints for public policy? Does the seminar explore these broader questions as they surface and diverge. The seminar focuses on political theory and political practice enter into a relationship which is mutually enriching while preserving their respective integrity? The seminar explores these broader questions as they surface and are illustrated in the so-called “Heidegger affair.” Attention will be given to both his philosophy and his politics in their interrelationship as well as their possible divergence.

Despite the suspicion of “meta-narratives,” our age seems to be pervaded worldwide by a dominant idea: the idea of “democracy” or at least the aspiration of “democratization.” Despite the great diversity of social and cultural traditions, humankind thus seems agreed on a common political goal—whose meaning, however, is unclear and subject to considerable contestation. Some neat distinctions made in the past—such as those between liberal democracy, people’s democracy, and Third World democracy—have largely disappeared with the collapse of the Soviet Union. By and large, liberal democracy appears today triumphant; but again, its meaning is ambivalent and subject to intense dispute. The seminar focuses on recent formulations of “deliberative democracy” and also on Michael Sandel’s Democracy’s Discontent.

697. Directed Readings
(V-V-V) Staff
Independent research and writing on an approved subject under the direction of the director of graduate studies.

699. Research and Dissertation
(V-V-V) Director of Graduate Studies
Independent research and writing on an approved subject under the direction of the director of graduate studies.

700. Nonresident Dissertation Research
(0-0-1) Director of Graduate Studies
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

Faculty

PERI E. ARNOLD, Professor and Director of Hesburgh Program in Public Service. B.A., Roosevelt Univ., 1964; M.A., Univ. of Chicago, 1967; Ph.D., ibid., 1972. (1971)


EDWARD A. GOERNER, Professor Emeritus. A.B., Univ. of Notre Dame, 1952; M.A., Univ. of Chicago, 1957; Ph.D., ibid., 1959. (1960)


FRANCES HAGOPIAN, Associate Professor. B.A., Brandeis Univ., 1974; Ph.D., Massachusetts Institute of Technology, 1986. (1999)


DONALD P. KOMMERS, Joseph and Elizabeth Robbke Professor of Government and International Studies and Professor of Law. B.A., Catholic Univ. of America, 1954; M.A., Univ. of Wisconsin, 1957; Ph.D., ibid., 1962. (1963)


KEIR LIEBER, Assistant Professor. B.A., Univ. of Wisconsin-Madison, 1992; M.A., Univ. of Chicago, 1996; Ph.D., ibid., 2000. (2001)


A. JAMES McADAMS, Chair and Professor. B.A., Earlham College, 1976; M.A., Univ. of...


WALTER J. NICGORSKI, Professor in the Program of Liberal Studies and Concurrent Professor. A.B., Georgetown Univ., 1960; M.A., Univ. of Chicago, 1962; Ph.D., ibid., 1966. (1964)


DANIEL PHILPOTT, Assistant Professor. B.A., Univ. of Virginia, 1989; Ph.D., Harvard Univ., 1996. (2001)


REV. TIMOTHY R. SCULLY, C.S.C., Executive Vice President of the University and Professor. B.A., Univ. of Notre Dame, 1976; M.Div., ibid., 1979; M.A., Univ. of California, Berkeley, 1985; Ph.D., ibid., 1989. (1990)


Peace Studies

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The Program of Studies

The Joan B. Kroc Institute for International Peace Studies offers an interdisciplinary master’s degree in peace studies and a field of concentration within doctoral programs in traditional disciplines. Graduate work in peace studies at the institute is highly international in character and designed to equip students with both theoretical understanding and practical skills. The master’s program attracts highly qualified students from all continents and major cultural regions of the world, with three-fourths of the students coming from outside the United States. In a highly selective process, the institute accepts 20 students annually in its 11-month Master of Arts program. The institute particularly seeks students from war-torn areas or regions where violence could erupt, and actively seeks to ensure cultural, religious, and socioeconomic diversity among participants. Peace studies students engage in building community as they share their diverse perspectives on the problems of peace and justice facing the world. The program prepares peace studies students for careers in scholarly research, teaching, public service, religious leadership, political organizing, or social action. Students specialize in one of the following themes while attaining some proficiency in all four areas:

The role of international norms and institutions in peacemaking: Institute faculty and students search for ways (a) to make intergovernmental organizations and other international institutions more effective and representative and (b) to increase compliance with fundamental norms of peace and human rights.

The impact of religious, philosophical, and cultural influences on peace: Through teaching and research, the institute explores the ethics of the use of force, the ways in which the world’s religious traditions foment violence or encourage peace, the practice of nonviolence, the importance of philosophies of global justice, and the ingredients of cultures of peace.

The dynamics of intergroup conflict and conflict transformation: Students and faculty enhance multidisciplinary understanding of the conditions that give rise to violent conflicts in order to identify local and international responses able to transform conflicts and encourage peacebuilding. All of the institute’s conflict studies incorporate cross-cultural examination of key issues.

The promotion of social, economic, and environmental justice: Students and faculty interested in social change examine the role of nongovernmental organizations and commercial enterprises, and states, in sustainable economic development, respect for human rights, and conflict transformation.

To earn the M.A. degree, students must demonstrate proficiency in one foreign language and successfully complete 30 hours of credit and a comprehensive exam.

Requirements of the program include the following core seminars and courses:

IIPS 502. Origins of Violence and Cultures of Peace

IIPS 505-506. Peacemaking Praxis and Professional Development

IIPS 521. War, Human Rights, and Peacebuilding

IIPS 522. International Political Economy and Sustainable Development

IIPS 530. Peace Studies Laboratory
505, 506. Peacebuilding Praxis and Professional Development
(3-0-3) Hayner, Johansen
This is a required course running the length of the academic year, designed to prepare the student for the practical aspects of peacemaking. These include the application of theory in the field, the ability to identify and discuss possible solutions for problems facing one’s nation or homeland, the technical aspects of peace research, and preparation for entry into the job market or Ph.D. studies. These goals will be met in a variety of ways, tailored (as far as possible) to the specific needs of the individual student. (Every fall and spring)

513. Exploring Identities
(3-0-3) Pingle
How do we define ourselves? What are the various components of one’s identity and how do we begin to understand these issues sociologically? These themes form the outlines of this course. We will explore identities, their formation, and their consequences: in post-colonial and in western societies, in peaceful and in societies experiencing ethnic/racial conflict, among women and men, and in developed and in developing countries. Drawing on novels, films, autobiographies, and sociological arguments we will piece together a framework for understanding the identity landscapes of which we are a part. (Every fall or spring)

515E. Images of War and Peace in Literature
(3-0-3) Ruthann Johansen
Using English language novels and poetry of the 20th century, this course will (1) examine the metaphors and themes that unmask the realities of war and disclose the aspirations and struggles for peace, and (2) explore the ways literary works themselves — through language, rhythms, and images — become battlegrounds on which the human imagination creates an individual’s sense of self and constructs and deconstructs cultural ideologies. Literature translated into English from other languages may be the focus of independent research projects within the course. (Every fall)

517. International Migration and Human Rights
(3-0-3) Bustamante
This course is an extension from the “minicourse” with a wider coverage of international migration experiences in the world with an emphasis on human rights. It starts with a historical approach to various immigration waves to the United States, from the years of the “industrial revolution” to the present. It focuses on the current debate on the impact of the undocumented immigration from Mexico and Central America, with a discussion of the gap between public perceptions and research findings. Differences between Mexico and the United States’ migration policies, and its social and economic implications, are discussed. The recent developments within the context of the United Nations Commission for Human Rights on the relationship between migration and human rights are also covered. (Every spring)

521A. War, Human Rights, and Peacebuilding
(3-0-3) Robert Johansen
This required course examines major global issues and multilateral responses to them in the areas of human rights and war prevention. The course, which emphasizes peace research methods and findings, includes study of the theory and practice of peacebuilding in its broadest sense of nurturing social integration and promoting justice as the work of peace. Discussion of human rights issues will include the Universal Declaration and Covenants; the rights of women and children; efforts to hold individuals accountable to prohibitions of war crimes and crimes against humanity; and questions of identity as they affect sovereignty and compliance with human rights norms. Discussion of war/peace issues will include debates among peace researchers, feminists, and political realists on causes of violence and conditions of peace; arms control and disarmament; intergroup tension reduction; and efforts by international commissions, the United Nations, and nongovernmental organizations to implement humanitarian norms of peace and human rights and gradually replace the rule of force with the rule of law in international relations. (Every fall)

522A. International Political Economy and Sustainable Development
(3-0-3) Väyrynen
This required course focuses on the global economic and environmental problems and the multilateral responses to cope with them. Its vantage point is that economic globalization is a complex phenomenon; it has both positive and negative consequences that vary from one society and social group to another. The course deals, in particular, with the impact of globalization on sustainable development, social equity, labor, health, and environment. It also discusses the political aspects of globalization that are, among other things, related to the democratic and governance deficits in international relations. Democratic governance of global economic and environmental relations requires the reform
of the existing international institutions and the development of new ones. Particularly important are the contributions of non-state actors, especially NGOs, in initiating, implementing, monitoring, and enforcing international rules. This aspect of globalization harks back to the emergence of new, autonomous transnational spaces and networks that become arenas of global civil politics and culture promoting new ethical standards, participation, transparency, and accountability. (Every spring)

530. Peace Studies Laboratory
(3-0-3) Staff
This required course is a study and application of alternative approaches to global value realization and world order change. Course purposes are (1) to learn how people who think about the future formulate their policy recommendations for ensuring human survival and enhancing human dignity; (2) to learn modeling application skills; (3) to identify criteria for assessing the extent to which governments implement policies aimed at securing the values of human dignity; and (4) to develop realistic policy recommendations for implementing selected aspects, described in a joint statement, of the most peaceful and just "preferred world" on which the class can agree. (Every summer session)

556,557. Conflict Transformation and Peacebuilding
(3-0-3)Lederach
This year-long required course ensures that students learn the elicitive method of conflict transformation, know how to conduct constructive roles for third parties in disputes, and apply learning to real world conflicts where they will be working after graduation. Students will interact with and apply a framework for strategic peacebuilding in settings of protracted conflict. (Fall, spring, summer)

565. International Political Economy
(3-0-3) Mosley
This seminar explores the interaction between politics and economics in the international system, with an emphasis on the theoretical development of the sub-field of international political economy. We will investigate the balance between cooperation and conflict, the effect of international institutions on economic relations, and the mutual impact of domestic and international politics. Throughout the course, we will consider how well models developed in other fields of political science or economics can be applied to international political economy. We also will attempt to identify the “state of the art” in the study of international political economy. (Every fall)

566. Nonviolent Social Change
(3-0-3) Cortright
This course will examine strategies of nonviolent social change as reflected in the writings of Dr. Martin Luther King Jr., Mohandas K. Gandhi, Gene Sharp, and Latin American advocates of liberation theology. These will be contrasted and compared with very different traditions of social change advocacy in the work of Saul Alinsky and Malcolm X. The course will also look at historical examples of nonviolent social change and explore the factors accounting for the success or failure of various social change movements, including: the U.S. civil rights movement, the 1989 democratic revolutions in Central and Eastern Europe and the U.S. peace movement. The main part of the course will be an examination of the practical methods of nonviolent social change. The techniques of nonviolent action will be thoroughly assessed. Specific methods to be studied include: power analysis, coalition building, media communications, fund raising, grassroots organizing, and lobbying. (Every spring)

573. International Migrations and Human Rights: Research and Policy Making
(3-0-3) Bustamante
This seminar focuses on research reports on U.S. immigration from Mexico for a critique of research methods and basic differences in the interpretation of data. A review of the literature is discussed with an emphasis on policymaking on immigration in the United States and Mexico. A comparison is made between the debate on migrants’ human rights in various parts of the world. A critique on scientific theories focusing on the relationship between international migrations and human rights is also included. (Every fall)

575. Democratic Theory and Multiculturalism
(3-0-3) Dallmayr
We live increasingly in a multicultural world. But is this trend compatible with democracy? In recent decades, democratic theory has been a battlefield between “liberals” and “communitarians.” In both camps, multiculturalism is problematic. Liberals give primacy to autonomous individuals, outside cultural contexts. Communitarians stress community values, neglecting the multiplicity of cultural and religious values. The seminar explores the possibility of a multicultural democracy, beyond liberal detachment and communitarian parochialism. Starting from the liberal-communitarian debate, the seminar proceeds to a discussion of multicultural democracy both on the domestic level and on that of “cosmopolitan democracy.” (Every fall)

578. Political Economics Postindustrial Societies
(3-0-3) Messina
This course investigates the nexus between politics and economics in the postindustrial societies. After a brief discussion of the theoretical principles of economic liberalism, the course focuses on the impact of economic actors and conditions on politics and the institutional and economic consequences of the organization of the world economy along free market principles. It concludes by scrutinizing the relationship between domestic politics and the project for deeper economic integration in the case of the European Union. (Every fall)

580. Ethnic Conflict and Peace Processes
(3-0-3) Darby, Mahmood
This team-taught course focuses on the ethnic conflicts that are found across the world today, and considers the special issues of peacebuilding where ethnicity is implicated. A review of theories of ethnicity is followed by in-depth consideration of the following cases: Kashmir, Punjab, Cyprus, Northern Ireland, Israel/Palestine, South Africa, Sri Lanka, and Spain (Basques). Students work in teams to develop plans toward peacebuilding in these and other areas of their choosing. What works and what doesn’t work where racial, religious, linguistic, and other “primordial” affiliations entangle with political conflict? We review successes and failures and propose possible new approaches. (Every fall)

611. Globalization and Multinational Corporate Responsibility
(1.5-0-1.5) Tavis
Globalization is galloping across our world at a dramatic pace—enhancing global productivity but leaving many people behind in the process. As the key integrating institutions, multinational enterprises deserve much of the credit for the productivity, but are also inextricably involved in the associated social destruction. The objective of this course is to enhance the awareness and understanding of future business executives, governmental officials,
or managers of nongovernmental organizations about the evolving role of the multinational enterprise, and how that role should be managed.

633. International Law
(3-0-3) Carozza or Shelton
This course uses a problem-oriented approach to introduce students to international law, not as a body of static rules, but rather as a decision making process that includes a structure of decision makers as well as a body of highly flexible prescriptions. International law is seen as a process of continuous interaction, of continuous demand and response. The Nuremberg Trials are used as a means of developing an understanding of the international legal process. Using problems pertaining to environmental protection, economic well-being, human rights, and war prevention, students engage in analysis of international institutions, procedures, and prescriptions. Finally, an examination is made of the potential contribution of international law to a sustainable future. (Every fall)

660. Theories of International Relations
(3-0-3) Lieber
This course provides first- and second-year graduate students with an in-depth investigation of the major theories which have guided Western scholarship and policy-making in international relations in the post-1945 world. In this course we are not as much concerned with learning about the world as much as we are concerned about learning how scholars and policymakers learn about the world. In particular, we will be examining those frameworks and methods that modern social science employs in describing, explaining, and predicting international events. The rationale underlying this approach is that these frameworks are the “real world” upon which policymakers base much of their judgment. (Every fall)

671. International Human Rights Law
(3-0-3) Mendez
This course examines human rights as legally protected rights in international law, with reference to the practice of states in general, including the United States; reviews the wider recognition of substantive human rights in a growing number of international instruments; appraises future prospects of further progress as well as inherent obstacles and possibility of overcoming prejudices and discrimination; examines the extent to which human rights have become part of positive international law; evaluates the effectiveness and weaknesses of existing legal institutions; and assesses endeavors to realize human rights in an international community of sovereign states, whose policies reflect differing social backgrounds and varying national interests. (Every spring)

679A. Dispute Resolution
(3-0-3) Fick
This course considers the theory and procedure of different legal methods for resolving disputes with an emphasis on negotiation, mediation, and arbitration. It consists of readings, analysis of disputes (both real and hypothetical) and methods for resolving them, and simulation problems. Students who have taken the Legal Negotiation course may only receive two credit hours for this course. (Every spring)

694A. Universal Protection of Human Rights
(3-0-3) Mendez
Prerequisite: International Law or equivalent.
A foundational course in international human rights law. Focuses primarily on examples from United Nations-related human rights regimes and examines: the historical and jurisprudential bases of international human rights law; the normative frameworks of the principal universal human rights treaties and of customary international law; and the institutional mechanisms for interpreting, monitoring compliance with, and enforcing those norms.

Other Graduate Courses
597. Directed Readings (V-V-V) Staff
599. Thesis Direction (V-V-V) Staff
Research and writing on an approved subject under the direction of a faculty member.

600. Nonresident Thesis Research (0-0-1) Staff
Required of nonresident graduate students who are completing their theses in absentia and who wish to retain their degree status.

697. Directed Readings (V-V-V) Staff
702. Peace Studies Practicum (V-V-V) Staff

Upper-level Undergraduate Courses
In addition to the courses listed above, the following 400-level courses may be taken for graduate credit in accordance with the restrictions established by the Graduate School and with the consent of the director of graduate studies.
419. Self, Society, and Environment
433. International Humanitarian Issues
451. Politics of Tropical Africa
456. Tradition and Modernization in China and Japan
474. Conflict Resolution: Theory and Practice

Core Faculty
R. SCOTT APPLEBY, John M. Regan Jr.
Director of the Kroc Institute and Professor of History.

ROBERT C. JOHANSEN, Senior Fellow and
Director of Graduate Studies of the Kroc Institute and Professor of Government and International Studies.

GEORGE A. LOPEZ, Senior Fellow and
Director of Policy Studies of the Institute and Professor of Government and International Studies.

CYNTHIA K. MAHMOOD, Director of
Undergraduate Studies of the Kroc Institute and Associate Professor of Anthropology.

Fellows
ASMA AFSARUDDIN, Assistant Professor of Classics.

REV. MICHAEL J. BAXTER, C.S.C.,
Assistant Professor of Theology.

DORIS L. BERGEN, Associate Professor of History.

JEFFREY H. BERGSTRAND, Associate
Professor of Finance and Business Economics.

REV. DAVID B. BURRELL, C.S.C., Rev.
Theodore M. Hesburgh, C.S.C., Professor of Arts
and Letters (Philosophy and Theology).

PAOLO G. CAROZZA, Associate Professor of Law.

DAVID B. CORTRIGHT, Research Fellow
and President, Fourth Freedom Forum.

E. MARK CUMMINGS, Professor of Psychology.

FRED R. DALLMAYR, Packey J. Dee
Professor of Government and International Studies.

JOHN DARBY, Research Fellow and Senior
Research Fellow, INCORE (Initiative on
Conflict Resolution and Ethnicity), Northern Ireland.
Y. Center and local community mental health agencies provide the settings for practicum experiences. The program produces successful aging. The University Counseling Center and local community mental health agencies provide the settings for practicum experiences. The program produces experiences that are theoretically sound and practically relevant. Faculty research programs with children and adolescents include parent-infant attachment and emotional development, preschool prevention programs and early intervention efforts, early cognitive delays and mild retardation, reading and language, the effects of family conflict on children, teenage parenting, and marital relationships. Research efforts involving college students and young adults focus on the development of healthy lifestyles, the relations between gender and achievement, and the effects of self-presentation and self-disclosure on everyday interactions and the counseling process. Still other research programs emphasize later life transitions and adaptations such as marriage and marital satisfaction, managing serious health problems, and successful aging. The University Counseling Center and local community mental health agencies provide the settings for practicum experiences. The program produces academically oriented psychologists who appreciate how science and practice inform each other and how both are indispensable in the advancement of the discipline.

I. Cognitive

Doctoral candidates in cognitive psychology can acquire knowledge in several areas of cognition, including human memory, attention, psycholinguistics, perception, sensation, neuropsychology, and higher order processes, as well as expertise in experimental methods and quantitative analysis. Research in these substantive areas stresses issues in memory retrieval, spatial cognition, language production and comprehension, music cognition, visual and auditory processing, attention, and aging. A sophisticated array of methodologies are used, including eye tracking, event related potentials, and psychophysical scaling. This combination of experiences prepares students for postdoctoral careers in university, industry, and government settings.

II. Counseling

The Notre Dame doctoral program in counseling psychology is built upon a scientist-practitioner model of training and has a strong developmental orientation. It capitalizes on the traditional strengths of both counseling and clinical psychology in understanding adolescent and adult developmental problems as well as the emergence of behavioral disorders in children. Although the program prepares students for individual assessment and treatment across the life span, it emphasizes prevention of problems that are theoretically sound and practically relevant. Faculty research programs with children and adolescents include parent-infant attachment and emotional development, preschool prevention programs and early intervention efforts, early cognitive delays and mild retardation, reading and language, the effects of family conflict on children, teenage parenting, and marital relationships. Research efforts involving college students and young adults focus on the development of healthy lifestyles, the relations between gender and achievement, and the effects of self-presentation and self-disclosure on everyday interactions and the counseling process. Still other research programs emphasize later life transitions and adaptations such as marriage and marital satisfaction, managing serious health problems, and successful aging. The University Counseling Center and local community mental health agencies provide the settings for practicum experiences. The program produces academically oriented psychologists who appreciate how science and practice inform each other and how both are indispensable in the advancement of the discipline.

Sociology

JOHN PAUL LEDERACH, Research Fellow and Professor of Conflict Studies, Eastern Mennonite University, Harrisonburg, Virginia

DANIEL LINDLEY, Assistant Professor of Government and International Studies.

DAVID M. LODGE, Professor of Biological Sciences.

SCOTT P. MAINWARING, Eugene and Helen Kellogg Professor of Government and International Studies and Director of the Helen Kellogg Institute for International Studies.

A. JAMES McADAMS, Chair and Professor of Government and International Studies.

JUAN MÉNDEZ, Professor of Law and Director of the Center for Civil and Human Rights.

MARTHA L. MERRITT, Assistant Professor of Government and International Studies.

LAYNA MOSLEY, Assistant Professor of Government and International Studies.

VAI-LAM MUI, Associate Professor of Economics.

DANIEL J. MYERS, Assistant Professor of Sociology.

CAROLYN R. NORDSTROM, Associate Professor of Anthropology.

VICTORIA D. L. SANFORD, Assistant Professor of Anthropology.

DINAH L. SHELTON, Professor of Law.

KRISTIN SHRADER-FRECHETTE, O’Neill Professor of Philosophy and Concurrent Professor of Biological Sciences.

JAMES P. STERBA, Professor of Philosophy.

LEE A. TAVIS, C.R. Smith Professor of Business Administration (Finance) and Director of the Program on Multinational Managers and Developing Country Concerns.

RAIMO VÄYRYNEN, Professor of Government and International Studies.

A. PETER WALSHE, Director of the African Studies Program and Professor of Government and International Studies.

ANDREW J. WEIGERT, Professor of Sociology.

TODD D. WHITMORE, Associate Professor of Theology and Director of the Program in Catholic Social Tradition.

CHARLES K. WILBER, Emeritus Professor of Economics.

REV. OLIVER F. WILLIAMS, C.S.C., William and Dorothy C.R. Smith Professor of Philosophy and Concurrent Professor of Law.

REV. PATRICK D. GAFFNEY, C.S.C., professor of Theology and Director of the Program in Catholic Social Tradition.
III. Developmental

Doctoral candidates in the developmental program study development of individuals, families, and how the two interrelate. A life-span perspective is emphasized for both the individual (infancy to old age) and the family (formation to dissolution). Typical as well as atypical development, normative transitions, and the impact of nonnormative events are examined. The methodology of developmental research is stressed, and effort is made to generate knowledge and theory that have potential for application to social issues related to the development of individuals across the life span. Areas of specialization emphasize theoretical frameworks that view the individual from a systems perspective, methodology to assess family interaction and patterns of change, and intervention techniques to facilitate human development. The emphasis is on developing substantive knowledge bases necessary for careers in research and scholarship, in teaching, and in intervention. Concentrations in developmental psychology vary according to the specific interests of students and fit into three categories: cognitive development, socioemotional development, and developmental psychopathology.

Cognitive Development

This area stresses research in various specialty areas in cognition, including memory and cognitive changes during childhood, cognitive styles, and metacognition. Also included in this area is an opportunity to interface with our developing emphasis in educational psychology and our cognitive program. Developmental research emanating from the cognitive program focuses on the effects of age on the neural architecture supporting executive control and prospective memory, as well as the representation and processing of information in situational models.

Socioemotional Development

Research in this area of developmental psychology focuses on social and emotional development in infancy, early childhood, adolescence, and later life. Particular areas of emphasis are attachment, parenting behaviors, friendships, and social support. The interface between personal characteristics (such as personality, gender, or temperament) and contextual factors (such as family environment, marital conflict, or parental adjustment to the teen’s transition into adolescence) is highlighted. Faculty research, using behavioral genetic methodologies, also assesses genetic and environmental influences on individual differences in many of these attributes.

IV. Quantitative

Doctoral candidates in the quantitative program receive advanced training in statistical methods and quantitative models applicable to psychology. The quantitative area emphasizes a wide range of topics, including traditional analysis of variance and regression, categorical data analysis, structural equation modeling, and dynamical systems modeling. Quantitative students will typically apply these methods to a topic in a substantive area of psychology, such as cognitive, counseling, or developmental. The extent of the substantive training above and beyond the quantitative training will depend on the interests of the individual student.

The quantitative program faculty train students to have expertise in a variety of analytical tools and to advance methodology through novel research on statistical applications and creative use of existing techniques. Areas of expertise within the program include math modeling and statistics. As in all of our programs, there is great flexibility of curriculum, and students may work with a variety of faculty, both within and between programs.

Curriculum

The graduate program in psychology is primarily oriented toward the doctoral degree and consists of two stages. The first requires a minimum of 24 hours of coursework and completing and defending a research thesis. During their first year, students are expected to take PSY 507 and 508. Upon completion of first-stage requirements, a student is eligible to receive a master’s degree by completing the additional requirements of the Graduate School and their particular program.

The second stage of the program ordinarily involves two more years of course work, research activity, practicum (where appropriate), and preparation for the doctoral preliminary examinations, followed by an additional year of work on the dissertation and internship (in the counseling program). To fulfill the doctoral degree requirements, students must take Advanced Research Methods (PSY 610) or Psychological Measurement (PSY 609), one additional statistics course; at least four graduate-level seminars and achieve a total of 72 or more credit hours. In the second stage, the written preliminary examinations and the oral dissertation proposal defense are ordinarily completed during the third year. The awarding of the doctor of philosophy degree requires: (1) satisfactory performance on the departmental preliminary examinations; (2) completion of course requirements with a B average; and (3) submission of an approved dissertation to the Graduate School.

Special Facilities

Haggar Hall contains faculty offices, a variety of research laboratories, a faculty-student lounge, and classrooms. In addition, the University Counseling Center is available as a training facility for doctoral students in the counseling psychology program, and the Laboratory for Social Research provides a number of interdisciplinary training and research services.

Application

In order to be considered for admission in August, applications and supporting materials must be received by January 2 of that year (the University’s deadline is February 1). No applicants are considered for January admission. The program is oriented to students who plan to attend on a full-time basis. Applicants will be expected to have completed undergraduate courses in general and experimental psychology and statistics. Applicants must take the Graduate Record Examination. Advanced subject test in psychology is preferred, but not required.
Course Descriptions
Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–
laboratory or tutorial hours per week–
credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

I. Quantitative Methods Courses

507. Quantitative Methods in Psychology I
(3-0-3) Maxwell, Schuster
Prerequisite: Elementary Statistics or its equivalent.
All first-year psychology graduate students at Notre Dame are required to take a two-
semester statistics sequence. The first semester begins with an introduction to
descriptive statistics, probability theory, and statistical inference. Well-known one- and
two-sample tests will be presented. In addition the course introduces students to
test analysis for analyzing the
dependence of a continuous variable onto one or more other variables. Emphasis is
given to an adequate specification of the
regression model by including polynomial and interaction terms in the regression
functions and to the evaluation of the
regression model by means of model
comparison and residual analysis. (Fall)

506. Formal Representations of Psychological
Hypotheses
(3-0-3) Wenger
This course would serve as an introduction to methods for representing hypotheses
regarding psychological processes and phenomena as mathematical and/or
computational models. Emphasis is placed on stochastic process models, and analytic and
computational tools for constructing and
exploring such models, in the context
of particular psychological phenomena, will be introduced. Issues of model identifiabil-
ity and testability will be emphasized.
Students will be responsible for constructing and
exploring the predictions of a formal representation of a hypothesis in their own
area of expertise and interest.

508. Quantitative Methods in Psychology II
(3-0-3) Maxwell
Prerequisite: PSY 507.
The second semester of the required
sequence focuses on experimental design and
analysis of variance as a method for
investigating mean differences among
groups, whether or not the groups are
formed experimentally. The course begins
by developing principles for assessing the
validity of various types of experimental and
non-experimental approaches for investigat-
ing psychological phenomena. This
semester continues the model comparison
theme developed in the first semester by
showing how questions of mean differences can be conceptualized in terms of various
statistical models. Special emphasis is placed on
repeated measures designs, including the
multivariate approach to data analysis.
(Spring)

509. Exploratory and Graphical Data Analysis
(3-0-3) Boker
The process by which psychological
knowledge advances involves a cycle of
test development, experimental design
and hypothesis testing. But after the
hypothesis test either does or doesn’t reject a
null hypothesis, where does the idea for the
next experiment come from? Exploratory
data analysis completes this research cycle
by helping to form and change new
theories. After the planned hypothesis
testing for an experiment is finished,
exploratory data analysis can look for
patterns in these data that may have been
missed by the original hypothesis tests.
Successful exploratory analyses help the
researcher modify theories and modify or
design novel experiments with focused
hypothesis tests. A second use of exploratory
data analysis is in diagnostics for hypothesis
tests. There are many reasons why a
hypothesis test might fail. There are even
times when a hypothesis test will reject the
null for an unexpected reason. By becoming
familiar with data through exploratory
methods, the informed researcher can
understand what went wrong (or what went
right for the wrong reason).

510. Seminar in Quantitative Psychology
(3-0-3) Boker, Maxwell, Schuster
This seminar is designed to facilitate the
acquisition of a minor in quantitative
psychology and to assist quantitative
students in the development of their early
research projects. Methodological and
analytical tools will be highlighted and
discussed, the procedures for doing research
on quantitative issues will be examined, and
direction on how to write up the results will be
provided.

565. Quantitative Genetics
(3-0-3) Bergeman
Quantitative genetic research provides a
powerful tool for studying both genetic and
environmental influences on individual
differences in behavioral development. This
course covers the genetic principles,
methods (including family, twin, and
adoption designs), and analytical techniques
(e.g., intraclass correlations and model-
fitting analyses) necessary for understanding
hereditary and environmental influences on
behavior. The use of multivariate and
longitudinal models is stressed.

607. Multivariate Analysis
(3-0-3) Boker, Maxwell, Schuster
Prerequisite: PSY 508.
Multivariate analysis provides the funda-
mental basis for psychometric measurement
and the identification of underlying
common factors associated with behavior.
This course begins with a review of linear
algebra and provides the student with a
background in multivariate regression,
multivariate analysis of variance and
covariance, factor analysis, canonical
correlation, and discriminant function
analysis. This course provides the founda-
tions for more advanced methods for
longitudinal modeling. (Fall)

608A. Structural Equation Modeling
(3-0-3) Boker
Prerequisite: PSY 508.
Structural equation modeling has become
one of the most powerful tools available for
the analysis of experimental and epidemiolo-
logical data arising in gerontological
research. This course presents a variety of
models in the context of practical theory in
order to develop the student’s ability to
translate competing theories into testable
alternative structural models. (Spring)

608B. Advanced Structural Equation
Modeling
(3-0-3) Boker
This course builds on the practical approach
used in PSY 608A by introducing a general
algebraic method for calculating covari-
ance and means expectations. Multigroup
structural modeling with means are
introduced and models from twin studies,
growth curve analysis models, and missing
data models are used as examples.

609. Psychological Measurement
(3-0-3) Bergeman, Maxwell
Prerequisite: PSY 507.
This course introduces concepts from
classical test theory, generalizability theory,
and item response theory. Students review
the foundations of test instruments
construction from these three perspectives
in creating self-report, standardized, and
observation/interview measures. The course
also highlights issues of equality across groups, assessing change versus measurement error, criterion-referenced tests, and clinical versus statistical prediction. (Every other spring)

610. Advanced Research Methods
(3-0-3) Carlson, Day
This course offers students an overview of philosophy of science, study design, threats to internal and external validity, measurement, qualitative research methods, and research ethics. Techniques of scientific writing and journal editing are described and practiced. (Spring)

611. Dynamical Systems Data Analysis
(3-0-3) Boker
Questions posed by researchers in psychology require studying evolving behavior over time. Dynamical systems methods were developed to study just such evolving systems and can be helpful in both experimental design as well as analysis of resulting data. This course presents methods that can be used to analyze intra-individual variability from a dynamical systems perspective. Recently developed techniques such as mutual information, state-space embedding, fractal dimension, and surrogate data tests are presented along with more traditional time series and linear statistical methods.

613. Longitudinal Data Analysis
(3-0-3) Maxwell
The first reading in this course is a book chapter by John Nesselroade describing two fundamentally different ways of conceptualizing change: change in individual differences or individual differences in change. The former can be studied by such techniques as multiple regression and standard longitudinal applications of structural equation modeling, but the latter requires a different approach. In particular, this course focuses on multilevel models (i.e., hierarchical linear modeling, or HLM) as a methodology for studying individual growth and individual differences in change. Although students learn to use multilevel modeling software, the primary types of questions are addressed by unconditional models of change (such as the models implicit in HLM) as compared to more traditional conditional models of change.

617. Seminar in Quantitative Psychology
(3-0-3) Boker, Maxwell, Schuster
Discussion-oriented course focusing on special topics in quantitative psychology.

618A. Formal Representations of Psychological Hypotheses I
(3-0-3) Wenger
Prerequisite: Permission of instructor.
This course serves as an introduction to methods for representing hypotheses regarding psychological processes and phenomena as mathematical and/or computational models. Emphasis is placed on stochastic models, and analytic and computational tools for constructing and exploring such models in the context of particular psychological phenomena will be introduced. Issues of model indentifiability and testability will be emphasized. Students will be responsible for constructing and exploring the predictions of a formal representation of a hypothesis in their own area of expertise.

618B. Formal Representations of Psychological Hypotheses II
(3-0-3) Wenger
Prerequisite: Permission of instructor.
This course extends the methods introduced in PSY 618A by considering particular forms of stochastic models in psychology. Course content will vary by semester and will include one-dimensional and multidimensional signal detection theory (as an approach to both modeling and measurement), deterministic and stochastic linear dynamic systems theory as methods for modeling phenomena, and simple neural networks and learning models. In all cases, issues of model identifiability and testability will be considered. Students will be responsible for constructing and exploring the predictions of a formal representation of a hypothesis in their own area of expertise.

692C. Introduction to Categorical Data Analysis
(3-0-3) Schuster
The course provides an introduction to analyzing categorical data by means of log-linear models. The log-linear model approach is very well suited to analyze the joint distribution of categorical variables and the association among categorical variables, as well as the dependence of categorical variables upon other variables. Hence, research questions pertaining to the joint distribution, the association, and/or the dependence of categorical variables can be answered using log-linear models. Participants of the course are expected to have a basic understanding of statistical inference (hypothesis testing and parameter estimation) and regression analysis.

II. Cognitive Area

514. Cognitive Psychology
(3-0-3) Carlson
A general overview of the field of cognitive psychology, including issues in perception, attention, memory, language, problem solving, reasoning, cognitive neuropsychology, and cognitive science.

515, 516. Instructional Systems Design
(3-0-3) (3-0-3) Crowell
This course provides an introduction to the field of instructional technology with particular emphasis on computer-based learning. Topics for consideration include instructional design and measurement, computer hardware components/requirements and approaches to instructional programming. A project requirement will enable students to get practical experience in the development of educational courseware.

518. Memory
(3-0-3) Carlson
A specialized course covering basic issues in human memory, including models of memory, forms of memory representation, basic memory phenomena, developmental changes in memory performance, and current research.

519. Learning
(3-0-3) Crowell
A study of the methods, theories, and facts associated with the investigation of the basic processes in learning. Emphasized areas include classical conditioning, instrumental learning, and operant training. The various research paradigms used in these areas will be closely examined. Some attention also is given to basic motivation theory. (Every other fall)

520. Psycholinguistics
(3-0-3) Eberhard
This course focuses on the major theoretical issues motivating research in each of the three primary areas of psycholinguistics: language acquisition, comprehension, and production. Topics that will be covered include the debate over whether the mechanisms of language and acquisition are innate, past and present theoretical perspectives on the interaction between linguistic and discourse processes during language comprehension, and the pragmatic and linguistic factors involved in communicating thoughts through speech.
521. Perception and Attention
(3-0-3) Gibson, Wenger
A specialized course covering basic foundations and recent theories of perceptual processing attention.

522. Human Reasoning and Problem Solving
(3-0-3) Carlson
A specialized course covering issues of how people perform tasks that require logical reasoning. Also covered are topics on how people solve problems that confront them in the world, including issues of analogical reasoning. Emphasis will be on current issues in human reasoning and problem solving.

525. Cognitive Methods
(3-0-3) Carlson
This course will focus on methodology specific to studies in cognitive psychology and cognitive science. The goal is to equip the student with the necessary skills to set up and run a lab. To that end, topics will include basic programming (enough to get an experiment up and running in Basic, C, and Pascal), basic electronics (enough to enable interface of peripherals to a computer), use of various test equipment (oscilloscope, function generator), exposure to more sophisticated equipment (scramble reflectance eye tracker, purkinje eye tracker, head mounted eye tracker, ERP system), data manipulation, trimming, and analysis.

529. Neuropsychology
(3-0-3) Gibson, West
This course investigates the relationship between mind and brain from the perspectives of cognitive psychology, neuroscience, and computer science. Major topics include brain imaging techniques (e.g., PET, MRI, fMRI, and ERP), hemispheric specialization, motor control, object recognition, spatial processing, attention, language, memory, executive functions, and consciousness. The major objective of the course is to show how each of these mental processes can be linked to neuroanatomical substrates.

563. Cognitive Development
See course description under the developmental area course offerings.

612. Language and Thought
See course description under the developmental area course offerings.

615A. Seminar in Cognition: Memory
(3-0-3) Carlson

615B. Seminar in Cognition: Learning
(3-0-3) Crowell

615C. Seminar in Cognition: Perception
(3-0-3) Dawson, Gibson

615D. Seminar in Cognition: Language
(3-0-3) Staff

615E. Seminar in Cognition: Attention
(3-0-3) Staff

615F. Seminar in Cognition: Language
(3-0-3) Carlson

615G. Seminar in Cognition: Spatial Cognition
(3-0-3) Staff

619. Seminar in Psychophysiology
(3-0-3) Staff
The research, theories, and methodologies employed in the electrophysiological study of the thinking, feeling, and behaving organism are discussed. Particular emphasis is placed on the interactions among the cognitive, affective, and neurologic processes and the manner in which these components relate and contribute to the total functioning system.

620. Seminar in Psychophysics
(3-0-3) Dawson
A study of the relations between physical variables and their psychological effects. Topics will vary with the interests of the students and the instructor.

621. Research Projects in Learning
(0-0-3) Crowell, Whitman
Supervised research in learning.

622. Research Projects in Perception
(0-0-3) Carlson, Dawson, Gibson, Wenger
Supervised research in perception.

623. Research Projects in Cognitive Processes
(0-0-3) Borkowski
Supervised research in cognitive processes.

III. Counseling Area

501A–H. Science/Practice Seminar
(2-0-1) Smith
Classic and contemporary topics in the science and practice of counseling psychology. Topics rotating by semester. Typical topics would be ideographic versus nomothetic research, clinical versus actuarial prediction, evidence based practice, and manualized treatment.

502. Professional Psychology Seminar
(3-0-3) Staff
This seminar focuses in depth on specific topics within professional psychology, such as an introduction to professional psychology, the causes of childhood depression and early cognitive delays, the effects of family conflict on children, and teenage parenting. The course is intended to help students to develop expertise in a content area and hone their critical thinking skills. (Spring)

531. Personality
(3-0-3) Kelly, Meara, Merluzzi
This course considers the history and background of the study of personality as well as the influence that heredity, culture, learning, and motivation have on the development of personality throughout the life span. It also deals with personality abnormality, perceptual-cognitive influences on personality, creativity, and other topics. (Spring)

532. Professional Psychology: Methods and Practice
(3-0-3) Kelly, Merluzzi
Students will be introduced to the key research methods, empirical findings, and theories from the clinical/counseling psychology literature. Prospects for developing and testing new theories of psychotherapy will be discussed. Students will be encouraged to begin conceptualizing research projects and developing their own integrated theoretical approaches to treating clients. (Fall)

533. Adult Psychopathology
(3-0-3) Staff
DSM IV classification of mental illness. Theoretical and research approaches to an understanding of the etiology of personality disturbances. (Spring)

534. Group Dynamics and Consultation
(3-0-3) Merluzzi
The course will cover the theoretical foundations of small group behavior. Research on interpersonal behavior, communication, and small group dynamics will be used as the basis for laboratory experiences in which these processes can be observed and coded. The theory and research on interpersonal behavior, communication, and small group dynamics will be applied to group therapy and family therapy through a series of laboratory
classes. Finally, the information on group dynamics will be applied to the consultation process. Models of consulting will be reviewed ranging from clinical supervision to consulting in commercial business and health care. (Spring)

535. Developmental Psychopathology (3-0-3) Cummings
This course articulates principles for a life-span perspective on the origins and development of individual patterns of adaption and maladaption. (Spring)

536. Diversity Issues: Gender, Race, Sexuality (3-0-3) Meara, Pope-Davis
This course provides students with theory, knowledge, and skills in diversity issues pertaining to clinical and counseling psychology. (Spring)

537. History and Systems/Ethics (3-0-3) Meara
Overview of historical trends and influential theorists in psychology. Also addresses ethical issues involved in psychological research and practice. (Fall)

538. Preventive Intervention and Program Evaluation (3-0-3) Staff
This course covers preventive practices as well as evaluating the effectiveness of such practices. (Spring)

539. Clinical Skills and Interventions I (3-0-1) Staff
Prerequisite to practicum courses. Prepares doctoral students in core communications conditions of counseling, active listening skills, and various counseling techniques. (Fall)

540. Clinical Skills and Interventions II (3-0-1) Staff
Prerequisite to practicum courses. Prepares doctoral counseling students in understanding dimensions of the counseling process, learning how to conduct intake interviews, and address clinical case management issues. (Spring)

542. Neuropsychological Assessment (3-0-3) Staff
This course covers brain physiology and normal and abnormal neuropsychological functioning. In addition, procedures for assessing the integrity of neuropsychological functioning are described.

531A. Adult Individual Psychological Assessment (2-4-3) Corning, Smith
An examination of the theoretical foundations and practical applications of individual intelligence tests and projective techniques. ($10 fee) (Fall)

531B. Adult Individual Psychological Assessment – Lab (2-3-3) Staff
Supervised experience in using psychological assessment instruments with adults. (Spring)

533. Supervised Counseling Practicum (1-6-3) Staff
Supervised counseling experiences with various types of clients.
   a. University Counseling Center
   b. University Counseling Center
   c & d. community placements
   e & f. advanced practicum (Fall, spring, summer)

537, 639. Supervised Internship in Counseling Psychology (0-0-1) (0-0-1) (0-0-1) Staff
Work with clients individually, in groups, and in field setting as a full-time counseling trainee. (Every year)

642A. Psychological Assessment of Children (3-0-3) Staff
This course is designed to provide (1) an overview of the procedures available for the psychological assessment of children and (2) supervised experience in the utilization of these procedures. (Fall)

642B. Psychological Assessment of Children—Lab (2-3-3) Staff
Supervised experience in using psychological assessments with children. (Spring)

644. Supervision of Counseling (3-0-3) Pope-Davis
An examination of strategies for supervising counseling as well as practice at being a supervisor of counseling activities. (Fall)

IV. Developmental Area
A. General Courses
535. Developmental Psychopathology
See course description under the counseling area course offerings.

561. Theories of Development Across the Life Span (3-0-3) Bergeman, Braunagrt, Day
A survey of the issues, theories, and research relevant to human psychological change across the life span.

562. Socio-Emotional Development I (3-0-3) Braunagrt
Current research and theory in social and emotional development in infancy and early childhood are reviewed. Some of the topics covered include: attachment, temperament, emotion regulation, parenting and family issues, and peer relationships.

563. Cognitive Development (3-0-3) Day, West
Major theories in cognitive development and data relevant to those theories are reviewed. Mechanisms that might account for observed developmental changes across the life span (e.g., processing speed) are discussed.

564. Psychology of Aging (3-0-3) Bergeman
A broad survey of topics relevant to the psychology of aging including social and biological aspects, personality, maladjustment and psychopathology, psychological correlates of aging, and special problems related to the psychological and physical well-being of the elderly.

565. Behavioral Genetics (3-0-3) Bergeman
Behavioral genetic research provides a powerful tool for studying both genetic and environmental influences on individual differences in development. The course will cover the genetic principles and methods necessary for understanding hereditary influences on behavior and will overview genetic and environmental influences on behavioral, biomedical, and biobehavioral attributes.

566. Socio-Emotional Development II (3-0-3) Gondoli
This course focuses on socio-emotional development from adolescence to late adulthood. Topics include the life-span view of attachment, developmental changes in the nature and importance of friendhip and social support, and autonomy and connection in family and peer relationships.

612. Language and Thought (3-0-3) Staff
The psychology of language is approached from a number of different perspectives,
drawing on research from linguistics, cognitive psychology, language acquisition, developmental psychology, and philosophy. Issues covered include: the production and understanding of speech, children’s acquisition of their first language, the development and structure of concepts and categories, and the relations between cognition and language.

632. Adult Personality Assessment
(3-0-3) Staff
This course is a continuation of PSY 630 and focuses on more complex issues in psychological assessment of adults. Topics include projective testing, neuropsychological screening, learning disabilities, assessment responses to specific questions (i.e., potential for violence, dementia vs. depression), and an introduction to forensic assessment issues (i.e., parenting, competency). This course assumes prior understanding of basic assessment techniques such as intelligence and achievement testing, self-report personality inventories, and basic report writing skills.

635. Laboratory II and III
(3-0-3) Staff
Supervised clinical practicum for second-year doctoral students in counseling psychology.

636A. Practicum IV and V
(3-0-3) Staff
Supervised clinical practicum for third-year doctoral students in counseling psychology.

645. Marriage, Children, and the Family
(3-0-3) Cummings
This course focuses on current trends and findings in several major areas of research on family relationships and their implications for human development, including marital relationships, parent-child relationships, marital relationships and children, sibling relationships, the role of extended family in family functioning, and intergenerational transmission of family patterns. Themes include a family systems perspective, that is, an assumption that relationships are bidirectional, or more complex, the relevance of research to understanding adjustment, and research design and methodology for the study of family.

646. Seminar in Family Therapy
See course description under counseling area course offerings.

646A. Children/Families in Conflict
(3-0-3) Cummings
Current trends and findings pertaining to conflict within families and the effects of conflicts within families on children will be considered. A focus will be on interrelations between family systems (marital, parent-child, and sibling) and methodologies for studying these questions. A particular concern will be how positive and negative conflict processes in the marital relationship affect children. The role of interparental conflict in various family contexts (divorce, parental depression, violence and abuse, custody, and physical illness or disability) and relations between family and community conflict and violence, will be examined. The positive side of family conflict will also be considered, including the elements of constructive marital and family conflict and strategies for promoting for constructive conflict processes within families.

646B. Marital Therapy Seminar
(3-0-3) Smith
This didactic course covering the principles and practice of couples therapy prepares trainees for the companion practicum (646C), through which they will subsequently carry cases at the Marital Therapy and Research Clinic. Sample topics include communication, problem-solving, domestic violence, parenting, and sex/intimacy.

646C. Marital Therapy Practicum
(V-V-V) Smith
Trainees who have successfully completed the Marital Therapy Seminar (646B) register for this supervised practicum every semester. They carry cases at the Marital Therapy and Research Clinic.

661. Seminar in Developmental Psychology
(3-0-3) Bergeman, Borkowski, Day
Contemporary topics will be offered from either the child development or the life span development area.

662. Research Projects in Developmental Psychology
(3-0-3) Staff
Supervised research in developmental psychology.

663. Teaching and the Development of Thought
(3-0-3) Day
An examination of current research in cognition and instruction. The focus is on how cognitive processes can be enhanced through education. Also included are readings and discussions on how individual differences, such as special aptitudes, may influence learning in the classroom.

664. Personality, Psychopathology, and Aging
(3-0-3) Bergeman
The personality development and psychopathological problems of the elderly are considered in connection with biological, social, and personal factors that relate to changes beyond young adulthood. Etiologies of mental health disorders and therapeutic interventions are covered.

665. Motivation and Academic Learning
(3-0-3) Turner
The course examines student motivation for learning as a function of both individual differences and classroom environments. We study the major theories of achievement motivation and will discuss them from theoretical, empirical, and developmental points of view. Formulating motivational implications for teaching and learning in K through 12 and college classrooms is an integral part of the course.

666. Seminar: Theory and Research in Aging
(3-0-3) Bergeman
This course covers contemporary research topics in gerontological research, theoretical approaches to these issues, and types of research designs used in the study of the aged.

B. Mental Retardation Courses

667. Seminar: Experimental Analysis of Behavior
(3-0-3) Whitman
The basic principles governing human behavior within the framework of social, operant, and respondent learning. The technology derived from these principles is surveyed with special attention to the analysis of behavior and application of change procedures within educational, home, and institutional settings.

668. Seminar: Mental Retardation
(3-0-3) Borkowski, Whitman
A general descriptive, theoretical, and empirical overview of the area of mental retardation with special emphasis on the etiology and modification of retardation within a learning-developmental framework.

669. Seminar: Comparative Approaches to Cognition and Intelligence
(3-0-3) Borkowski
Methods, data, and theory relating to cognitive changes in normal and handicapped children, adults, and the aged are
considered. The content focus is on the use of theories of intelligence and cognition to understand the performance of “special” children.

670. Developmental Issues in Mental Retardation
(3-0-3) Borkowski, Whitman
Effect of early experience upon the incidence and development of mental retardation is examined. Special attention is given to the defect vs. difference theories and the controversies surrounding the issue of intelligence.

671. Sociocultural Aspects of Mental Retardation
(3-0-3) Borkowski, Whitman
An examination of the reciprocal effects of the mentally retarded and society upon each other. The effects of the family, institutionalization, and normalized community programs upon the retarded and their ethical implications are examined within a psychological and sociological perspective.

672. Research and Theory in Mental Retardation
(3-0-3) Borkowski, Whitman
Current research literature in mental retardation with emphasis devoted to the types of theories and methodologies being employed.

673. Mental Retardation: Learning, Memory, and Cognition
(3-0-3) Borkowski, Whitman
Current research in learning, memory, and cognition in both normal and retarded children. Focus is on theories and techniques that yield behavioral generalization across time and settings.

675, 676. Practicum: Behavioral Assessment and Programming with the Mentally Retarded
(3-0-3) (3-0-3) Borkowski, Whitman
A practicum providing the student with the opportunity to develop, use, and assess the effects of behavior modification procedures in institutional, school, and other community settings.

677A, B. Research Projects in Mental Retardation
(0-0-V) (0-0-V) Borkowski, Whitman
Students are supervised during the conceptualization, conduct, data analysis, and formal written presentation of projects using mentally retarded subjects.

695A. Research/Special Topics
(V-V-V) Staff

695B. Reading/Special Topics
(V-V-V) Staff

V. Additional Course Offerings

585. Attitude Theory and Research
(3-0-3) Staff
A study of the theoretical and empirical literature on attitude formation and change. Some previous acquaintance with attitude research is desirable but not absolutely necessary.

586. Applied Social Psychology
(3-0-3) Staff
An overview of applications of basic research to areas such as health, environment, and law.

587. Social Cognition
(3-0-3) Staff
This seminar focuses on the investigation of how individuals’ thought processes, emotions, and motivations influence the ways they understand both themselves and others. Student participation includes presentation of empirical research, discussion of theories, and the development of a research proposal within the domain of social cognition. Sample topics include affect and cognition, the self, attribution theories, social inference, self-fulfilling prophecies, and stereotypic change.

588. Interpersonal Influence and Social Relationships
(3-0-3) Staff
This course covers several areas of interpersonal influence and social relationships from a social psychological viewpoint. Topics include symbolic interactionist approaches to self-concept development, expectancy effects, group dynamics, attraction, and intimate relationships.

685. Seminar in Social Psychology
(3-0-3) Staff
Contemporary topics in social psychology. Student participation includes presenting research results and experimental proposals and leading discussions. Sample topics include social cognition, person perception, attitudes, and stereotypes.

VI. Research and Unspecified Courses

593, 594. Seminar: Special Topics
(3-0-3) (3-0-3) Staff
Topics and prerequisites to be specified by the instructor.

595A, B. Seminar in Behavioral Techniques in Business
(3-0-3) (3-0-3) Staff
An ongoing seminar on the principles of behavioral techniques and their application to ongoing organizational and work settings.

596A. B. Practicum in Behavior Management
(V-V-V) (V-V-V) Crowell
Supervised internship in practice of behavior management.

599. Thesis Direction
(V-V-V) Staff
For students doing work for a research master’s degree, maximum of six hours allowed.

600. Nonresident Thesis Research
(0-0-1) Staff
For master’s degree students.

647. Seminar in Social Psychology
(3-0-3) Staff
An introduction to computer programming for psychologists.

695. Seminar: Special Topics
(3-0-3) Staff
Topics and prerequisites to be specified by the instructor.

696. Seminar: Instrumentation in Psychology
(3-0-3) Staff
Practical training in the use of instruments and types of equipment often employed in psychological research.

699. Research and Dissertation
(V-V-V) Staff
For resident graduate students who have completed all course requirements for the Ph.D.; maximum of 12 hours allowed.

700. Nonresident Dissertation Research
(0-0-1) Staff
For doctoral students.

701A. Graduate Seminar: Introduction to Teaching
(1-0-1) Searle
Designed to be taken concurrently with the first two semesters of a student teaching assistantship, ordinarily in years one, two, or three. It will meet five times (approximately every third week) per semester for 1-1/2 hours. The primary goals of the course are to orient students to the profession of teaching, assist them in their assigned tasks as TAs, and practice the skills of observing
and reflecting on their experiences in the classroom setting. An additional five hours of observing/interviewing in other departments of the University and in local schools/colleges/universities will be required. The courses will be graded Satisfactory or Unsatisfactory.

N.B. Those who are assigned teaching assistantships, but who do not plan to take the above course for credit, would be welcome to participate as fully as they wish in the meetings, especially the processing of their experience as TAs, but they would not be responsible for any materials or activities outside these meetings.

701B. Graduate Seminar: Theories and Methods
(3-0-3) Day
Recent theory and research on students’ learning is reviewed, particularly as such learning occurs in institutions of higher education. Models of effective instruction are described. Other topics include writing lesson plans, developing a teaching philosophy, testing, and grading. (Offered every other fall for students in their second year or beyond.)

702A. Graduate Practicum: Course Planning
(3-0-3) Searle
Students will meet on a regular basis to as they prepare to be the instructor of record in an Intro or Stats/Methods or 300-level content course (e.g., abnormal, developmental, cognitive, etc.). Ordinarily, students will have their teaching assignment for the following year by this point and can focus on a specific preparation. They will write objective, create syllabi, critique planned assignments, design tests, discuss grading, etc. In conjunction with the current instructor of record, they may be responsible for giving a lecture/presenting a unit in the instructor’s class. Grading is S/U. (Offered every spring for students in their second year or beyond.)

702B. Graduate Practicum: Course Delivery and Evaluation
(1-0-1) Searle
(May be elected for a maximum of two semesters.) Graduate students who are new instructors of record, ordinarily in their fourth or fifth years, will meet throughout the semester to reflect on their experience of teaching, engage in group problem solving, and revise their syllabi. A central component of this level of the teaching practicum is being observed by other class members as well as the supervisor, and learning to improve teaching skills through the integration of constructive feedback. Grading is S/U. (Offered fall and spring semesters).

702C. Graduate Practicum
(V-V-V) (V-V-V) Staff
Supervised teaching in the classroom or laboratory for first year composition or other departmental courses. May be elected for a maximum of two semesters.

Faculty

Cognitive Area


BRADLEY S. GIBSON, Associate Professor. B.S., Colorado State Univ., 1982; Ph.D., Univ. of Arizona, 1992. (1994)


Developmental Area

CINDY S. BERGEMAN, Associate Professor. B.S., Univ. of Idaho, 1979; M.S., Pennsylvania State Univ., 1987; Ph.D., ibid., 1989. (1990)

JOHN G. BORKOWSKI, McKenna Family Professor of Psychology. A.B., St. Benedict’s College, 1960; M.A., Ohio Univ., 1962; Ph.D., Univ. of Iowa, 1964. (1967)


JEANNE D. DAY, Chair and Professor. B.A., Univ. of California, San Diego, 1974; M.A., Univ. of Illinois, 1977; Ph.D., ibid., 1980. (1980)
Sociology

Chair:
Michael R. Welch

Chair of Admissions Committee:
Maureen T. Hallinan

Director of Graduate Studies:
David M. Klein

Telephone: (219) 631-6463
E-mail: soc@nd.edu
(www.nd.edu/~soc)

The Program of Studies

The Department of Sociology offers training leading to the conferral of two graduate degrees: the master of arts (M.A.) and the doctor of philosophy (Ph.D.). Although the M.A. degree is available to graduate students, admission is given to applicants whose goal is the doctorate.

The principal aims of this graduate training are to educate students in the theory and methods of social science, and to develop in them a competence as professionals in specific fields of sociology. A mastery of sociology in general and a strong background in the techniques that are used in scholarship and teaching in the discipline will enhance the potential of graduates for employment as academic and applied researchers, as instructors in colleges and universities, and as practitioners in government and the private sector.

Preference for admission to the graduate program in sociology is given to students who have taken social science at the undergraduate level. A course in elementary statistics is also preferred. If a student does not have this course, it may be made up while in graduate school.

The M.A. degree requires 30 hours of credit, of which six credit hours may be earned for the master’s thesis. All students must complete and defend a research thesis for the master’s degree.

The doctoral program normally occupies four years of full-time work for students with the bachelor’s degree. Core requirements must be fulfilled in the first two years according to scheduled sequencing. Intensive independent study in the student’s field of specialization is generally initiated in the second year. It is expected that the student will have completed all but the dissertation requirement by the conclusion of the third or fourth year of graduate study.

Several basic courses are required of all students who enter with only a bachelor’s degree; in addition, they are required of other students who cannot demonstrate previous equivalent work at the graduate level. These courses include: one semester of classical sociological theory, for three credit hours; a one-semester overview of sociological methods, for three credit hours; one semester of advanced social statistics (SOC 593), for three credit hours (the student must have taken a more elementary statistics course as a prerequisite, or have received the permission of the instructor); a seminar, extending across two semesters for a total of three credit hours (includes an introduction to faculty and facilities at the University and sessions on professional skills such as computing); and one semester of participation in a research practicum for a total of three credit hours.

Students are required to take at least four seminars, including at least one from each of the following two divisions: (1) advanced seminars in sociological theory and (2) advanced seminars in sociological methods or social statistics.

Beyond these, students may choose their areas of specialization in sociology, but the department is particularly strong in methodology and statistics, theory, organizations, social psychology, family, sociology of religion, comparative historical, political sociology, race and ethnicity, sociology of education, and sociology of culture.

If the emphasis and needs of the student’s interests require course work in other departments, the student may undertake such courses with the approval of his or her adviser and the director of graduate studies. It is also possible for the student to construct specialty areas provided faculty specialization is available.

To fulfill the training and research requirements, each candidate must select two specialty areas and pass a comprehensive examination in each. Dissertation research must be undertaken in at least one of the specialty areas.

Faculty members in sociology are affiliated with various institutes and centers providing additional opportunities for graduate studies: the Institute for Educational Initiatives, the Helen Kellogg Institute for International Studies, the Erasmus Institute, and the Institute for Latino Studies.


JOHN FRANCISCO DOS SANTOS, Professor Emeritus, B.S., Tulane Univ., 1948; M.S., ibid., 1952; Ph.D., ibid., 1958. (1965)


Quantitative Area

STEVEN M. BOKER, Assistant Professor, B.S., Univ. of Denver, 1972; M.A., Univ. of Virginia, 1994; Ph.D., ibid., 1996. (1996)


KE-HAI YUAN, Associate Professor, B.S., Beijing Institute of Technology; M.A., Beijing Institute of Technology; Ph.D., UCLA. (2001)

Social Area

ANRE VENTER, Associate Professor, Specialist, B.A., Univ. of Cape Town, 1980; M.A., Univ. of Notre Dame, 1994; Ph.D., ibid., 1996. (1996)
Teaching and research assistantships, fellowships for applicants from minority groups, dissertation-year fellowships, and tuition scholarships are available.

For a more detailed description of the graduate program requirements, the student is urged to send for a copy of the department's special bulletin.

Course Descriptions
Each course listing includes:
- Course Number
- Title
- (Lecture hours per week–laboratory or tutorial hours per week–credits per semester)
- Instructor
- Course Description
- (Semester normally offered)

502. Population Dynamics
(3-0-3) Williams
Demography, the science of population, is concerned with virtually everything that influences, or can be influenced by, population size, distribution, processes, structure, or characteristics. This course pays particular attention to the causes and consequences of population change. Changes in fertility, mortality, migration, technology, lifestyle, and culture have dramatically affected the United States and the other nations of the world. These changes have implications for a number of areas: hunger, the spread of illness and disease, environmental degradation, health services, household formation, the labor force, marriage and divorce, care for the elderly, birth control, poverty, urbanization, business marketing strategies, and political power. An understanding of these is important as business, government, and individuals attempt to deal with the demands of the changing population.

503. The Information Society
(3-0-3) Hachen
This seminar explores the social, political, economic, cultural, and organizational impacts of the information technology revolution. Among the topics examined are globalization, networked enterprises, transformation of work and employment, mass communication, conceptions of time and space, new social movements, the role of the nation state, and the crisis of democracy. Attention is also given to assessing the adequacy of existing sociological theories for understanding the changes that are occurring as the result of the information technology revolution.

504. Exploring Identities
(3-0-3) Pinglé
How do we define ourselves? What are the various components of one’s identity and how do we begin to understand these issues sociologically? These themes form the outlines of this course. We will explore identities, their formation, and their consequences; in post-colonial and in Western societies, in peaceful, and in societies experiencing ethnic/racial conflict, among women and men, and in developed and in developing countries. Drawing on novels, films, autobiographies, and sociological arguments we will piece together a framework for understanding the identity landscapes of which we are a part.

510. Contemporary Social Theory
(3-0-3) Valenzuela
This course examines, among others, neo-Marxist, functionalist, phenomenological, ethnomet hodological, exchange, dramaturgical, and rational choice approaches in 20th-century sociological theory. The basic questions guiding this exploration are what conceptions these perspectives have of the social structure and how they view the relationship between the individual and society.

511. Classical Social Theory
(3-0-3) Halton, Valenzuela, Weigert
An examination of the characteristics of the 19th-century episteme in knowledge and the space occupied by the human sciences. Specific theorists are discussed. (Fall)

513. Research Methods
(3-0-3) LeClere, Williams
Introduction to the philosophy of science, theory construction, research design, measurement, and sampling as they apply to sociological research. (Spring)

515. Political Sociology
(3-0-3) Fishman, Valenzuela
A survey of the major theoretical traditions in the field, followed by a special focus on issues such as the process of state formation, sequences and forms of political development, the social bases of parties and their formation, the characteristics of party systems, the origins of democracies, the breakdown of democracies, the characteristics of authoritarian regimes, etc. Examples and case studies will be drawn from Europe and the Americas.

516. Visual Sociology: Exploring Society Photographically
(3-0-3) Cárdenas
This course examines the uses of photography and film in sociology and explores the impact of visual expression on society. This includes introductory work in documentary photography and film, gender advertising, ethnographic film, political cinema, muralism, and social protest art. This is a sociology course and emphasizes the study of societal aspects of photography, film, and artistic expression, rather than technique, without ignoring the relationship between the two aspects. The course does not emphasize the technical/lab training in photography. This course, while broad in scope, relies on content that is very heavily grounded on a social problem context as is found in the U.S., the American Southwest, Mexico, and Latin America.

517. International Migrations and Human Rights
(3-0-3) Bustamante
This seminar focuses on research reports on U.S. immigration from Mexico and critiques research methods and basic differences in the interpretation of data. A review of the literature is discussed with an emphasis on policy making on immigration in the U.S. and Mexico. A comparison is made between the debate concerning migrants’ human rights in various parts of the world. A critique of scientific theories focusing on the relationship between international migrations and human rights is also included.

519. Social Stratification in American Society
(3-0-3) Carbonaro
This course is designed to give students an overview of the major theories and empirical research that describe and explain social and economic inequality in American society. In the course, we will cover the following topics: social mobility across generations; gender and racial inequalities in status and income; the role of labor markets in creating inequality; studies of the “underclass” (or urban poor); and the role of social policy in ameliorating the social problem of poverty. Special attention will be given to the role of education as a mechanism of stratification in each of the topics covered.

520. Organizations
(3-0-3) Hachen
This seminar is an in-depth introduction to theories of and research on organization.
Theoretical perspectives on social organization examined include functionalism, systems theory, contingency models, action frameworks, and both Marxian and Weberian approaches. The utility of theoretical perspectives is assessed by examining organizational dynamics. Among the topics investigated are goals and strategies, technologies, decision making, conflict, power, legitimation processes, forms of control, and organization-environment relations.

521. Social Stratification
(3-0-3) Hachen
In alternating years, focuses on social class and labor markets. The seminar on social class examines theories of and research on class structure, class formation, and social inequalities. Special attention is given to issues concerning the nature of the “middle class,” historical changes in class structures, the relation between class and income, intergenerational mobility, and debates about the emergence of new social classes. The seminar on labor markets focuses on economic and sociological approaches to understanding labor market processes and structures. After examining economic analyses of supply and demand in labor markets, various sociological perspectives are discussed, including segmentation theories, discussions of internal labor markets, research on job mobility, and models of employment relations. Historical, case study, quantitative, and comparative research is surveyed.

524. Cultural Studies: Art and Cultural Critique
(3-0-3) Halton
Cultural studies is a catchall term describing a wide array of writings in the social sciences and humanities the common concern of which involves a concept of culture and a sense that the borders between disciplines are either unnecessary or, at the least, highly permeable. Although the term “culture” has come into the foreground in the social sciences, literary criticism, and philosophy, it often signifies a highly contested terrain with widely diverse understandings of what constitutes a culture. The seminar will explore the ways the arts relate to cultural critique, both as expression of new modes of feeling and understanding and as a source for a critical perspective.

525. Sociology of Culture
(3-0-3) Spillman
Examines thinking about values, norms, symbols, and rituals in sociological analysis.

We read important classical and contemporary texts with concrete illustrations.

527. Culture and Power
(3-0-3) Spillman
How do norms, values, symbols, and rituals operate to dominate or empower? In this class we will examine a number of important classical and contemporary texts that offer answers to this question, which has been a theme of recent work in a variety of fields in sociology. At the same time we will examine concrete cases, selected from studies of development, deviance, gender, mass communications, organizations, social movements, and stratification.

528. Social Ties, Social Networks, Social Capital
(3-0-3) Fishman
This course examines three fundamental and interrelated sociological concepts, each of which offers us an approach to the study of social connections and their impact on the human experience. Social ties, social networks, and social capital overlap substantially in their scholarly usage but the concepts are far from identical. We will review theoretical and methodological literature on all three concepts as well as major empirical studies that examine the world through one or more of these perspectives. We will explore both theoretical and practical arguments for the selection of one or more of these conceptual approaches as the basis for studying how social connections shape the human experience. The course is intended to stimulate a critical reading of recent literature on contemporary society and to assist students who wish to use one or more of these concepts in their work.

530. Crime and Deviance in Ideological Perspective
(3-0-3) Welch
This seminar course examines selected issues in the study of crime and deviance such as white collar crime, gang violence, and pornography. Issues will change each time the course is offered. We compare responses made by those representing the left and right in American society and critique the adequacy of these responses from a sociological viewpoint.

531. Social Interaction
(3-0-3) Weigert
This course develops a symbolic interactionist perspective within social psychology. Readings focus on theoretical and empirical aspects of the interactional dimensions of the way we live as selves in relationship to others and social organizations. Students are responsible for discussions and a term paper.

533. Women and Work
(3-0-3) Cassirer
This seminar provides a survey of the central research topic in the area of gender and paid work. Students read and analyze recent research on a number of specific topics that have received considerable academic attention, including theoretical approaches to the study of gender and work; the construction and reproduction of gender on the job; sex segregation; sex inequality in pay, promotions, and authority; and sex differences in the relationship between paid work and family roles and responsibilities. Students read work by sociologists, economists, historians, and business scholars. Students develop their own original research proposal early in the semester and work on data collection/preparation analysis and a report of the findings throughout the semester, with the ultimate goal of moving toward publication or submission of a master’s thesis or dissertation proposal.

534. The Schooled Society: How Schools Shape Who We Are and How Society Works
(3-0-3) Carbonaro, Sikkink
Everyone knows schools teach students the “three Rs” (reading, ’riting, and ’rithmetic). However, few people think about the fourth “R” that schools teach us: our roles in society. In this course, we will examine how our experiences in school affect who we are as individuals. How do schools influence the way in which we play our many roles in life? Do schools have a “hidden curriculum” to make us good workers, conscientious citizens, responsible family members, etc.? What stake do various actors in society have in the people we become? We will examine both functionalist and conflict interpretations of how schools reproduce social relations and who benefits from such social arrangements.

535. World Families
(3-0-3) Aldous, Klein
World Families is a course designed to examine families across space and through time. The families to be studied come from a number of societies other than the United States. Also considered will be families in the United States as they existed in earlier periods to give another basis for comparison among families today.
538. Race Relations in the United States  
(3-0-3) Cassirer  
This course focuses on race and ethnic relations in the United States. The course begins by discussing basic concepts, issues, and theories of race and ethnic relations and stratification. We then examine the extent of race and ethnic inequality in the United States, with some attention toward similarities and differences in the experiences of race and ethnic groups. We discuss contemporary racial tensions in the United States and their expressions in racial attitudes, beliefs, and behavior. Finally, the course addresses remedies for race and ethnic inequality.

541. Family Policy Seminar  
(3-0-3) Aldous  
The seminar covers family policy in the United States and in other countries, with a concentration in the United States. There are comparisons of the background, content, and consequences of policies in the various countries. Such provocative topics as welfare policy, parental leave, and child care are discussed. The relation between families and the work setting or families and government will also be addressed. A discussion format is used. Students write a term paper on some aspect of family policy.

542. Labor Movement Formation and Politics  
(3-0-3) Valenzuela  
There have been two important changes in the position of workers within national societies since their early "heroic" period of protest. First, workers have won the right to organize into unions, and second, organized workers have created new political parties or established privileged links to existing ones. The course focuses on this dual process of change by examining various theoretical perspectives.

545. Family I  
(3-0-3) Aldous, Klein  
Covers current theoretical developments in the area of the family as well as particular data collection methods. Contemporary and continuing issues that family scholars have addressed are covered in the context of theory and research. Application of family research findings to policy, therapy, and other service-oriented fields is also covered. (Typically offered in the fall)

546. Family Problem Solving  
(3-0-3) Klein  
This course provides an in-depth analysis of processes families use to solve the problems they face. Material is drawn from the social psychology of small groups, the sociology of formal organizations, and research and theory directly concerned with family problem solving.

547. Designing Research Projects: Practical Problems and Theoretical Issues  
(3-0-3) Fishman  
The course is intended to familiarize students with practical problems and options—as well as some underlying theoretical issues—encountered by social scientists in the course of qualitative or field research. Themes covered include consideration of the relationship between broad interpretive categories and specific empirical observations as well as the delineation of a research problem. Research strategies discussed include comparative historical work, historical case studies, observation, survey research, and qualitative interviewing. Students are asked to formulate a research proposal and to carry out practical exercises involving the use of several research strategies.

549. Sociology of Masculinity  
(3-0-3) Gunty  
This seminar explores the social construction of masculinity in many forms, both traditional and emerging, through readings, movies, discussions, and writing assignments. Members of the seminar will seek a better understanding of shifting roles, identities, and social structures that influence the way both males and females develop the meaning of masculinity. Topics include socialization, role conflicts, gender violence, sexuality, the impact of fathering, and men’s movements. The course draws attention to the often unnoticed existence of multiple masculinities in the United States and around the world. This course is intended to complement the study of gender in other disciplines.

550. Sociology of Development: Theories and Issues  
(3-0-3) Bustamante, Valenzuela  
First part examines critically major theoretical statements, classical and contemporary, that inform the field. Readings are from Smith, Marx, Durkheim, Weber, and present-day modernization and dependency perspective authors. Second part discusses specific issues of Third World development. Topics vary but generally include trends in urbanization, impact of multinational corporations on host countries, political authoritarianism or democracy, equity versus growth, etc.

551. Sociology of Religion I  
(3-0-3) Christiano, Welch  
Classical and contemporary theories in the sociology of religion. Culture, stratification, ideology, and determinations of experience are some of the key issues related to societal and personal formulations of religion. Classical authors such as Durkheim, Marx, and Weber are considered.

553. Building Democratic Institutions in Latin America and European First Wave Democracies  
(3-0-3) Valenzuela  
Elements of democratic regimes emerged long before the regimes as such can be identified as being minimally in place. Beginning with a brief discussion of the essential features of democracies, the course examines how and why such institutions emerged, and the critical moments in which the actual transitions to the new democratic regimes occurred. The course focuses on democratizations that took place before the Second World War, and will examine key European and Latin American cases.

560. Research in Sociology of Education  
(3-0-3) Hallinan  
This seminar is a research practicum in the sociology of education. It will address theoretical, empirical, and policy-related issues in education from a sociological perspective. Ongoing research and analysis of major longitudinal surveys will be discussed. Students will have the opportunity to participate in the analyses of these data. The seminar would be useful to students beginning research on a master’s thesis or doctoral dissertation in the sociology of education.

565. Religion in Postwar America  
(3-0-3) Yamane  
This course surveys the major developments in religious life in the United States since the 1950s through an in-depth examination of several of the most important recent books on the subject, such as: Wade Clark Roof’s Spiritual Marketplace, Tom Beaudoin’s, Virtual Faith, Christian Smith’s American Evangelicalism, and Helen Berger’s A Community of Witches. With these works as the backdrop, each student will research and write her family’s religious history across three generations.

566. Sociology of Consumption  
(3-0-3) Halton  
Consumption touches on themes that were not only crucial to the founders of sociology, but that reach from the sources of
identity and small-scale processes to the problems of the emerging global economy and culture. Consumption studies are becoming increasingly prominent throughout the social sciences.

Today’s consumer societies offer the promises of affluence, of conveniences, of “the good life.” Yet it is by no means clear that the massive technological advances and material gains in advanced industrial societies have contributed to a better way of life—many would say increased meaninglessness is the actual result; a “goods life” instead of the good life. This seminar will consider some of the central issues and works in the emerging field of consumption studies.

567. Schools in Society
(3-0-3) Hallinan
This seminar examines and discusses major contemporary issues about schools and the schooling process. Topics include the role of schools in society; the political, economic, and social dimensions of schooling; education reform and its underpinnings; the social and organizational structure of schools; and the transformation of higher education. Invited speakers from off and on campus lead or participate in the discussions.

569. School Organization and Community
(3-0-3) Hallinan
This course will provide students with knowledge about the current state of educational practice in the United States. Contemporary educational issues will be analyzed from the perspective of sociological theory and research. The seminar will have two components. First, students will read and critique studies published in sociology and education journals. Second, students will make progress on their own research projects in sociology of education, make presentations of this work in class, and submit a final paper as a course requirement.

570. School Organization in Public Policy
(3-0-3) Hallinan
In this seminar students employ sociological theory and research to examine current educational issues and policies. Topics may include school organization, student achievement, national assessment, school choice, school integration, student networks, and school financing.

571. Protests, Riots, and Movements
(3-0-3) Myers
This course is concerned with how people act together to pursue collective political aims via extrainstitutional forms of behavior: When and why do people go outside the conventional political structure to address social issues important to them? During the course, we examine political behavior ranging from the relatively mild (like a letter writing campaign) to the severe (like rioting, looting, and killing). We also discuss aspects of collective behavior that are less political in nature (like panics and fads). Some of the social movements we discuss include the civil rights movement, the women’s movement, the anti-war movement, the gay and lesbian movement, pro-life and pro-choice movements, and the environmental movement (among many others). In the end, we try to explain how grievances, resources, the political environment, repression, individuals, decision making, and movement tactics all contribute to the success and failure of protest movements, their impact on social change, and the future of activism.

574. Society and Identity
(3-0-3) Weigert
This course looks at sources, dynamics, and consequences of identity in contemporary society. Identity is conceived as definitions of an individual that self and others use as a basis for interacting with one another. Significant outcomes of the way we are defined are the life chances, evaluations, and emotional meanings we experience. The course format is a discussion seminar. Grades are based on participation, an essay examination, and a 15-page research paper.

575A. B. Research Practicum (M.A.)
(3-0-3) (3-0-3) Fishman, Hachen, Hallinan
The aim of this research practicum is to assist second-year graduate students in writing their master’s theses.

576. Social Breakdown in American Society
(3-0-3) Welch
This course examines the apparent weakening of the fabric of social life in America that has occurred within the past half-century. It investigates the past influences of both the market economy and the political welfare state on several central societal problems, such as the deterioration of interpersonal trust, the erosion of social obligations and informal social control, and the lessening of altruistic concern for others. Students will discuss the significance of these problems, as well as potential solutions.

577. Families and their Interrelations with Gender
(3-0-3) Aldous
A consideration of the part gender plays in family processes like the couple formation through cohabitation and/or marriage, having and rearing children, division of labor, and the post-children era.

578. PSOS Seminar
(3-0-3) Hallinan
Most sessions of the PSOS Seminar feature a presentation of educational research by an invited speaker from off campus or by a Notre Dame faculty member or graduate student. The content of the presentation is discussed and students write a brief reaction. Other sessions are devoted to a discussion of chapters in the Handbook on the Sociology of Education. The seminar runs for both semesters during the academic year and students receive three credits for the entire year.

579. Comparing Democracies
(V-V-V) Staff

580. Qualitative Methodology
(3-0-3) Cárdenas
The seminar covers the general topic, with particular attention to ethnography and field work, visual methods, archival research, and related strategies. Heavy emphasis is placed on cross-cultural research in minority communities in the United States.

582. Social Demography of Minorities
(3-0-3) Garcia
This course focuses on the demographic status of ethnic minorities in the United States. Some of the major topics include population size and projections, geographical distribution, and residential patterns. Other issues are educational attainment, occupational status, and personal and family income. The course covers the basics of demographic methods and techniques.

585. Materials and Methods of Demographic Analysis
(3-0-3) LeClerc
This course is a survey course in techniques widely used in demographic analysis. These techniques include those that describe population structure, analyze demographic dynamics, and evaluate demographic data. In addition, many of the analytic skills and techniques stressed throughout the course have more general applicability in social science research. The aim of the course is to acquaint students with the nature and
introduce first-year graduate students to the structure of a variety of techniques and to provide students with the experience in applying those techniques.

586. Primary Data Collection and Survey Methodology (3-0-3) LeClere
This course is offered to graduate students in sociology and other social sciences who have an interest in the design, implementation, and use of social surveys and databases in social science research. The course examines all practical aspects of survey design including sample design and selection, questionnaire design, measurement, mode of administration, field methods, data editing, and database development. We also cover theoretical developments in survey methodology, including research on cognitive process and questionnaire response, the role of social theory in questionnaire design, and other specialized topics. This course will prove useful for both conducting primary data collection and interpreting data from secondary sources.

591. Proseminar (2-0-2) Hachen, Myers, Williams
Designed to acquaint first-year graduate students with the resources available in the department and at the University to assist them with their research. The key component of the seminar is a series of presentations by faculty on their current research.

592. Statistics I (3-0-3) Cassirer, Myers, Sikkink, Williams
Prerequisite: Prior course in statistics. This course reviews basic descriptive statistics and probability, then concentrates on inferential hypothesis testing (analysis of variance, linear regression, dummy variables, standardized coefficients, chi-square tests and basic contingency table analysis). (Fall)

593. Statistics II (3-0-3) Cassirer, Myers, Sikkink, Williams
The second course in the graduate sequence focuses on the general linear model in all its forms: special topics in multiple regression (multicollinearity, autocorrelation, heteroscedasticity), nonlinear models, causal modeling (recursive and nonrecursive systems), structural equations, logit equations, and probit models. (Spring)

596. Computing for Social Science Research (1-0-1) LeClere
This is a laboratory course designed to introduce first-year graduate students to the basic computational and statistical techniques used in social science quantitative research. The main goal of the course is to show students how to build and access a data set for analysis. As such, it is complementary to the core statistical and econometrics course offered in the social sciences. Students will be exposed to the different operating systems available at Notre Dame, and to a variety of statistical software applications. Topics treated include: reading data in different formats and checking it for errors, carrying out exploratory analyses, recoding and creation of new variables, merging data sets, performing extracts, and moving a data set between different operating environments.

604. Seminar in the Family (3-0-3) Aldous, Klein
This seminar is directed to the advanced students interested in specific topics and research developments in the family area. The students are encouraged to plan their own research and theory projects or to work on their thesis proposals. Offered to students specializing in family.

610. Seminar in Theory and Social Psychology (3-0-3) Halton, Klein, Weigert
A discussion of current theoretical approaches in sociological social psychology. Attention is paid to the interrelationship between macrosociological processes and the formation of self-identity. Application is made to contemporary interpretations of American culture.

613. Contemporary American Theory (3-0-3) Halton
A survey of current developments including social Darwinism, pragmatism, structural functionalism, and Chicago school.

615. Advanced Theory Construction (3-0-3) Klein
Techniques of formalized theory building are covered, including axiomatic systems, causal models, and cybernetic systems. The course is based on principles in the philosophy of science and gives students experience in shaping the structural and linguistic features of the theories to be used in their dissertation research.

617. Advanced Theory Seminar: Interpretation (3-0-3) Halton
Social theory, formerly more the province of sociologists, has come to the forefront of contemporary intellectual life for philosophers, literary critics, and others in the humanities. This seminar will be geared toward coming to terms with some of the principal issues and controversies animating contemporary theory, particularly the nature of signification and interpretation, and will reveal how much in the sociological tradition figures into these contemporary debates. We will explore the traditions of interpretation that form the basis for much contemporary social theory, including semiotics and semiology, phenomenology, pragmatism, and interpretive sociology.

Topics will include: What is the place of the act and of action/practice as a basis for interpretation? Are there natural bases for signification and social construction? What are the varieties of ways in which the self can be seen as a complex of signs, relativism, and objective interpretation?

618. Meaning, Materialism, and Modern Life (3-0-3) Halton
In the 20th century the problem of meaning has come to the forefront of modern civilization, animating revolutionary movements in art, forming the basis of a variety of philosophies and social theories, looming as the silent spectre behind mass society and its drama of consumption. Yet despite its obsession with meaning—or perhaps because of it—the 20th century as a whole might be said to avoid the central questions of the purpose of life: Why are we here? Where are we going?

By exploring the rise of the modernist world view, key expressions of 20th-century modern culture and recent criticisms of modernity and “post-” culture, we will attempt to achieve a new understanding of the problem of meaning and the possibilities of a transformed civilization. Key topics to be taken up in the course include the problem of meaning, the rise of modern materialism, the modern metropolis, artistic modernism and postmodernism, and the prospects of epochal transformation.

619. Seminar in Social Theory (3-0-3), Halton, Klein, Weigert
Content specified by agreement among faculty, students, and the committee for graduate studies. May be directed to the analysis and research of topics such as issues on the epistemology of the social sciences, specific orientations in contemporary sociological theory, the theoretical contributions of particular individuals, etc. Offered to students specializing in social theory.
620. Advanced Quantitative Seminar
(3-0-3) Hachen, Johnson, Williams
This course covers advanced statistical techniques used in social research. The specific content of the course will vary somewhat depending on the use of statistics in the discipline, but will usually include topics of structural equation modeling, log-linear models, and event history analysis.

622. Event History Analysis
(3-0-3) Hachen, LeClerce
This course provides an in-depth introduction to event history analysis methods for analyzing change in discrete dependent variables. The course draws on methodological and empirical research from the social sciences. Special attention is given to the relationship between theories of social change, life-cycle processes, and dynamic models. The course begins by examining nonparametric discrete-time life table models and then turns to continuous-time discrete-state models for the analysis of hazard rates. Parametric and partially parametric models which allow for dependency of rates both on explanatory factors and time are introduced. Problems concerning censored data and competing risks are also addressed.

646. Family II
(3-0-3) Aldous, Klein
Focuses on a critical analysis of current issues in the family. Such topics as work-family relations, changing gender roles, and historical studies are included. Other issues of particular interest to participating students and faculty are explored. (Typically offered in the spring)

652. Sociology of Religion II
(3-0-3) Christiano, Welch
Contemporary empirical studies in the sociology of religion are examined. Current developments and movements of religious behavior are related to such issues as political action, family structure, economic actions, and leisure.

659. Sociology of Education
(3-0-3) Hallinan, Sikkink
This seminar examines in depth the various ways schools and classrooms are organized for instruction and the consequences of that organization for students’ cognitive and social development. Of particular concern are issues of equity and organization. More general topics related to equity issues in education are also discussed, including school desegregation plans, public versus private schools, and school funding. Social science research informing these issues will be highlighted. The focus is on stratification and equity in elementary and secondary schools, rather than higher educational institutions.

675A. B. Research Practicum (Ph.D.)
(3-0-3) Fishman, Hachen, Hallinan
The aim of the research practicum is to assist graduate students in writing their dissertation proposals.

680. Writing for Academic Journals
(3-0-3) Welch
This seminar is intended for advanced (post-M.A.) graduate students in sociology. It requires students to develop and submit a paper to an appropriate academic journal. The course takes students through the following steps: (1) final preparation of a manuscript, (2) pre-submission review, (3) selecting an appropriate journal, (4) submitting the paper, (5) reviewing process, (6) interpreting reviewers’ and editors’ comments, (7) revising the paper, and (8) re-submission.

697A. B. Directed Readings
(V-V-V) Staff
Prerequisite: Departmental permission. Reading and research on highly-specialized topics that are immediately relevant to the student’s interests and that are not routinely covered in the regular curriculum.

699. Research and Dissertation
(V-V-V) Staff
For resident graduate students who have completed all course requirements for the Ph.D.

700. Nonresident Dissertation Research
(0-0-1) Staff
For doctoral students.

701. Graduate Seminar
(3-0-3) Christiano
The purpose of this course is to prepare graduate students in sociology for a career in teaching at colleges and universities. Course content includes treatment of practical concerns of teachers such as construction of a syllabus, selection of readings, composition of lectures, and grading of student performance. In addition, seminar time is devoted to discussion of larger issues, including the role of sociology in the liberal arts curriculum, the mission of teachers in the American professoriate, and the state of the academic labor market. A term project is required of all participants.

702. Graduate Teaching Practicum
(3-0-3) Christiano, Klein
Supervised experience for graduate students in the teaching of undergraduate sociology. Enrollment normally is limited to those students who have taught one course on their own or who will be teaching such a course. The purpose is to contribute to the professional development of students.

Upper-level Undergraduate Courses
A sampling of all possible 400-level courses to fulfill noncredit prerequisites or to fill up to 10 credit hours of the credit-hour requirement:

414. Minorities in America
419. Self, Society, and Environment
423. Race, Ethnicity, Identities
425. Ethnicity in America
431. The Fifties
432. Blues in American Culture
442. Family Careers (Family Development)
463. Health and Sickness
466. Sex Inequality in the Workplace
467. Global Food Systems

Faculty


DAVID S. HACHEN JR., Associate Professor, B.A., Lake Forest College, 1974; M.A., Univ. of Wisconsin, 1978; Ph.D., ibid., 1983. (1987)

MAUREEN T. HALLINAN, Chair of Graduate Admissions and William P. and Hazel B. White Professor of Arts and Letters, B.A., Marymount College, 1961; M.S., Univ. of Notre Dame, 1968; Ph.D., Univ. of Chicago, 1972. (1971)


DAVID M. KLEIN, Director of Graduate Studies and Associate Professor, B.A., Univ. of Washington, 1967; Ph.D., Univ. of Minnesota, 1978. (1976)

RICHARD A. LAMANNA, Associate Professor Emeritus, B.S., Fordham Univ., 1954; M.A., ibid., 1961; Ph.D., Univ. of North Carolina, 1964. (1964)

FELICIA B. LECLERE, Director of the Laboratory for Social Research and Associate Professor of Sociology, A.B., Mount Holyoke College, 1980; M.A., Univ. of Minnesota, 1985; M.S., Pennsylvania State Univ., 1987; Ph.D., ibid., 1990. (1997)


LYNETTE P. SPILLMAN, Associate Professor, B.A., Australian National Univ., 1982; M.A., Univ. of California, Berkeley, 1984; Ph.D., ibid., 1991. (1992)


ROBERT H. VASOLI, Associate Professor Emeritus, A.B., LeSalle College, 1952; M.A., Univ. of Notre Dame, 1953; Ph.D., ibid., 1964. (1957)


MICHAEL R. WELCH, Chair and Associate Professor, B.A., LeMoyne College, 1972; M.A., Univ. of North Carolina, 1975; Ph.D., ibid., 1980. (1981)

RICHARD A. WILLIAMS, Associate Professor, B.A., Creighton Univ., 1977; M.S., Univ. of Wisconsin, 1981; Ph.D., ibid., 1986. (1986)

DAVID YAMANE, Assistant Professor, A.B., Univ. of California, Berkeley, 1991; M.S., Univ. of Wisconsin, 1991; Ph.D., ibid., 1998. (1998)

Master of Education (M.Ed.) Program

Director:
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The Program of Studies

The M.Ed program is housed in the Institute for Educational Initiatives, which provides research leadership in education and fosters efforts in education that are informed by social science research. The only clients for this master’s program are students enrolled in the Alliance for Catholic Education. (The ACE program is described in the “Centers, Institutes, and Laboratories” section of this Bulletin.)

Students in this program work toward licensure, consistent with the standards in the state of Indiana, in each of the following areas: middle childhood (i.e., elementary education), early adolescence (middle school), adolescence and young adulthood (high school), English language arts, social studies, science, mathematics, and foreign languages. Like most teacher accreditation programs at the master’s level, content-area courses must be completed before entering the master’s program, which provides education course work only.

A total of 43 credit hours of course work and teaching experience are required, with an overall grade point of at least 3.0. Half of the course work will occur in two summer sessions, with 10 credits (i.e., three-three-credit courses and one one-credit seminar) earned in each. The faculty who teach in the M.Ed. program are drawn from a variety of disciplines and colleges within and, in some cases, from outside the University.

The first summer also includes practice teaching in South Bend-area elementary and secondary schools as well as 10 credit hours of course work. During the first school year, students take three credits of a distance learning seminar, and three credits of supervised teaching experience at an assigned Catholic school in the southern United States. In the second summer, students again take 10 credit hours of course work. During the second school year, students once again participate in a three-credit distance learning seminar and a three-credit supervised teaching experience in their assigned school, but they also earn three credits organizing a teaching portfolio, which will document their progress in developing as a teacher. A two-credit special methods course which begins in the summer and continues throughout the year can be taken either year.

In addition to the credit-hour and GPA requirements, students must complete two years of service in teaching with supervised teaching grades of not less than 3.0. The teaching portfolio must also be formally accepted by a committee of three faculty. Like a master’s thesis committee, the membership will be faculty who have worked with the student throughout the program. In the case of a deficient portfolio, the student will be provided specific feedback about how to improve it.

During the summer sessions, students live in community in Notre Dame residence halls, participating in presentations and programs aimed at stimulating their academic understanding of education, especially as it relates to community and spiritual development.
Admission Requirements
The M.Ed. program seeks to admit individuals who have the competence and commitment to be outstanding teachers and who are willing to serve for two years as teachers in cooperating Catholic schools. Competence for admission is assessed through evaluation of written essays, interviews, grade point average (at least a 3.0 in the major), standardized test scores, and letters of recommendation. Commitment to the community and spiritual ideals of the program is necessary.

Admission is a two-stage process. A selection committee composed of Notre Dame faculty, administrators, and staff assesses the candidates, identifying approximately 80 who will be asked to join the program. These 80 students will then be invited to apply to the Graduate School for admission. From this point on, the admissions process is identical to that of every other master’s program at the University.

Course Sequence
All ACE students are placed in one of three developmental-level curricular tracks: elementary, middle school, or high school, depending on their ACE placement. Those in the middle-school and high-school tracks are then placed in a content area: math, science, social studies, English/language arts, or foreign language. The particular methods and content courses will depend on the developmental-level track.

1. First summer (10 credits)
   EDU 502 Introduction to Teaching (one credit)
   EDU 503 Introductory Teaching Practicum (two credits)
   EDU 505 Cognition, Instruction, and Assessment (three credits)
   Alternates with content seminars (see second summer)
   EDU 511 Teaching of Reading and Writing (for elementary grades) (three credits) or
   EDU 521 Introduction to High School Teaching (three credits) or
   EDU 523 Introduction to Middle School Teaching (three credits)
   EDU 550 Integrative Seminar (one credit)

2. First school year (nine to 11 credits)
   Directed Readings (three credits). Internet delivery. Readings related to teaching content area and/or developmental level: EDU 512, 522, 524, 525, 526, 527, or 528 depending on specialization. Alternates with Moral Development and Education.
   Extended Curriculum Course: EDU 556, 557, 558, 559. May be taken either year (2/3 credits)
   EDU 595 Supervised Teaching (three credits each semester)

3. Second summer (10 to 13 credits)
   EDU 510 Child Development and Education (three credits) or
   EDU 520 Development and Education in Early Adolescence or
   EDU 530 Development and Education in Adolescence
   EDU 540 Exceptionality in Childhood or
   EDU 541 Exceptionality in Early Adolescence or
   EDU 542 Exceptionality in Adolescence
   Seminar in Content Area (three credits) EDU 513, 534, 535, 536, 537 or 538, depending on specialization. Alternates with EDU 505 (see first summer).
   EDU 555 Catechesis in Catholic Schools (three credits). May be taken to meet extended curriculum course requirement.
   EDU 550 Integrative Seminar (one credit)

4. Second school year (12 to 14 credits)
   EDU 554 Moral Development and Education “Internet Seminar” (three credits). Alternates with Directed Readings (see first school year).
   EDU 595 Supervised Teaching (three credits each semester)
   EDU 596 Summative Portfolio Development (three credits)
   Extended Curriculum Course EDU 556, 557, 558, 559 may be taken either year (2/3 credits)

Note: Students register for year-long Internet courses in both the fall and the spring. A grade of S or U is entered on transcript in the fall for zero credit, and a letter grade is entered for two to three credits in the spring.

Education Courses

502. Introduction to Teaching (3-0-3) Staff
An introduction to the meaning of contemporary teaching, including classroom organization and management, the technologically modern classroom environment, and contemporary Catholic schools. (First summer session course)

503. Introductory Teaching Practicum (2-0-2) Staff
An intense practicum experience in the South Bend-area schools during the summer. The experience will include approximately five to six weeks of closely supervised teaching experience as well as reflections on that experience. Extensive planning of instruction is required. (First summer session course)

505. Cognition, Instruction, and Assessment (3-0-3) Staff
Coverage of the psychological theory and research related to cognition and instruction, cognition and learning, motivation, individual differences in behavior, and assessment. Separate and targeted sections for each content area. (Alternates every other summer)

510. Child Development and Education (3-0-3) Staff
Coverage of cognitive, social, biological, and personality development relating to education, with an emphasis on childhood. (Second summer session course)

511. Teaching of Reading and Writing (V-V-V) Staff
An introduction to the development of literacy in the elementary grades. Coverage will include the theory and practice relative to preceding abilities, word recognition and fluency, and comprehension processes. The development of writing competencies as they occur throughout the elementary school years will be studied in relation to the development of reading skills. The theory and practice relative to spelling, handwriting, grammar, oral language, and listening will also be introduced. (First summer session course)
512. Directed Readings in Elementary Education  
(3-0-3) Staff  
Participants will develop a program of reading covering elementary-level reading and writing, mathematics, social studies, and science. Readings will be selected from the publications of the major professional associations in elementary curriculum (i.e., International Reading Association, National Council of Teachers of English, National Council of Teachers of Mathematics, National Council for the Social Studies, National Science Teachers Association). Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)

513. Seminar in Elementary Education  
(3-0-3) Staff  
Participants determine topics in elementary education that will be the focus of the course, doing in-depth reading as part of planning changes in their instruction and assessment during the second year of teaching in the M.Ed. program. Professional portfolio planning and development will be a prominent consideration in the course. (Alternates every other summer)

520. Development and Education in Early Adolescence  
(3-0-3) Staff  
Coverage of cognitive, social, biological, and personality development relating to education, with an emphasis on early adolescence. (Second summer session course)

521. Introduction to High School  
(3-0-3) Staff  
An integrative survey of the issues relating to the planning of instruction in high school, including the assessment of student progress in high school. (First summer session course)

522. Introduction to Middle School  
(3-0-3) Staff  
An integrative survey of the issues relating to the planning of instruction in the middle school including the assessment of student progress in the middle school. (First summer session course)

524. Directed Readings in Science Education  
(3-0-3) Staff  
Participants will develop a program of readings covering high school science education. Readings will be selected from the publications of the National Science Teachers Association. Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)

525. Directed Readings in Language Arts Education  
(3-0-3) Staff  
Participants will develop a program of reading covering high school language arts education. Readings will be selected from the publications of the International Reading Association and the National Council of Teachers of English. Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)

526. Directed Readings in Social Studies Education  
(3-0-3) Staff  
Participants will develop a program of reading covering high school social studies education. Readings will be selected from the publications of the National Council for the Social Studies. Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)

527. Directed Readings in Mathematics Education  
(3-0-3) Staff  
Participants will develop a program of readings covering high school mathematics education. Readings will be selected from the publications of the National Council of Teachers of Mathematics. Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)

528. Directed Readings in Foreign Language Education  
(3-0-3) Staff  
Participants will develop a program of readings covering high school foreign language education. Readings will be selected from the publications of the professional associations. Participants must relate readings to their teaching, in particular, documenting how their teaching performances have changed as a function of the readings. (Course taken during the first or second year of supervised teaching)
538. Seminar in Foreign Language Education
(3-0-3) Staff
Participants will determine topics in middle school and high school foreign language education that will be the focus of the course, doing in-depth reading as part of planning changes in their instruction and assessment during the second year of teaching in the M.Ed. program. Professional portfolio planning and development will be a prominent consideration in the course. (Alternates every other summer)

540. Exceptionality in Childhood
(3-0-3) Staff
A survey in exceptionality with emphasis on the elementary-aged child is followed by in-depth study of the common learning problems in the elementary grades, especially reading, writing, and mathematics disabilities. Both teaching strategies and assessment are considered. (Second summer session course)

541. Exceptionality in Early Adolescence
(3-0-3) Staff
A survey in exceptionality with emphasis on the middle-grades child will be followed by in-depth study of the common learning disabilities in the middle school, especially reading, writing, and mathematics disabilities. Both assessment and teaching strategies will be considered. (Second summer session course)

542. Exceptionality in Adolescence
(3-0-3) Staff
A survey in exceptionality with emphasis on the high-school-age youth will be followed by in-depth study of the common learning disabilities in the high school, especially reading, writing, and mathematics disabilities. Both assessment and teaching strategies will be considered. (Second summer session course)

550. Integrative Seminar
(2-0-2) Staff
This course is designed to assist participants in their ongoing integration of professional, communal, and spiritual dimensions of their lives as participants in the M.Ed. program of the Alliance for Catholic Education. The course is thus structured by the central objectives of the ACE M.Ed. experience: professional training, life in community, and spiritual/ethical development. In this course, these objectives are articulated as the pillars of ACE: “to teach as Jesus did, to live and love in small faith communities, and to foster spiritual growth.” Overall, participants agree to engage in active listening as well as interactive and collaborative learning exercises, so as to integrate more fully these pillars of ACE within their lives of professional service as educators in Catholic Schools. (Taken for one credit during each summer)

554. Moral Development and Education
(3-0-3) Staff
This course will examine the theoretical and research bases of moral development and education. Topics will vary by sections but will include: community, behavior, and discipline; civic engagement and social responsibility; sports and character; character education; teacher’s roles and responsibility; challenges of race and culture; coaching, community, and character; and spirituality and education. Participants will develop aspects of their professional portfolio through experience in the course. Credit awarded in spring semester with registration required in a summer and subsequent fall and spring semester.

555. Educating in Faith: Catechesis in Catholic Schools
(3-0-3) Staff
This course is designed to assist current or prospective teachers of theology at the secondary level in the catechesis of young adults in Catholic schools. Participants will explore both theoretical and practical dimensions of catechesis within class sessions designed to be highly dialogical and interactive.

556. Liturgical Music for Catholic Education
(2-0-2) Staff
Introduction to folk liturgical music and its appropriate use in K through 12 Catholic education. During the summer, students’ work in the folk liturgy can be used appropriately with respect to all sacraments and occasions for celebration in Catholic schools. Credit awarded during spring semester, with registration required in a summer session and the subsequent fall and spring semesters. An additional one credit is available for a second summer of participation.

557. Art Instruction Across the Curriculum
(2-0-2) Staff
A selection of practical methods and discussion topics to enable teachers to integrate art while teaching such subjects as English, writing, reading, drama, social studies, language arts, math, and chemistry at the elementary and high school level. Credit awarded in spring semester, with registration required in a summer session and subsequent fall and spring semesters.

558. Contemporary Educational Technology
(2-0-2) Staff
Integrates computing skills and critical thinking strategies required to use modern technology for enhanced teaching and learning. Credit awarded during spring semester, with registration required in a summer session and subsequent fall and spring semesters.

559. Coaching and Youth
(2-0-2) Staff
Covers social scientific research on coaching strategies that promote the social development of youth through sport; applications of research findings are emphasized. Credit awarded during spring semester, with registration required in a summer and subsequent fall and spring semester.

561. Children’s Literature
(2-0-2) Staff
Introduction to the use of children’s literature in elementary and middle school classrooms. Credit awarded during the spring semester, with registration required in a summer and subsequent spring semester.

595. Supervised Teaching
(12-12-12) Staff
Participants teach in Catholic schools with supervision by M.Ed., Alliance for Catholic Education, and school-based personnel. Professional portfolio development is emphasized as part of the experience. (Taken for three credits for each of four semesters of teaching)

596. Summative Portfolio Development
(3-0-3) Staff
The professional portfolio entries developed throughout a participant’s experiences in the program are integrated into a coherent narrative presentation. The portfolio will document how the participant has grown with respect to each of the INTASC principles, state standards, and to the three conceptual pillars of the M.Ed. program: academic development, increased understanding of how to promote community in education, and spiritual development that translates into effective spiritual and ethical development of students. (Taken during the second year of supervised teaching, with completion expected by the end of the second year of teaching and not later than one year following the completion of the second year of teaching).
Teaching and Research Faculty

The following list represents the Teaching and Research Faculty in the academic year 2001–2002.

JOHN H. ADAMS, Associate Professor of Biological Sciences
JOHN AFFLECK-GRAVES, Vice President, Associate Provost, and Notre Dame Professor of Finance
ASMA AFSARUDDIN, Assistant Professor of Classics and Fellow of Joan B. Kroc Institute for International Peace Studies
MARK S. ALBER, Professor of Mathematics
JOAN ALDOUS, Mark S. Alber, Professor of Computer Science and Engineering
SOTIRIOS A. BARBER, Professor of Government and International Studies
KARINA D. BARRON, Assistant Professor of Mathematics
WILLIS E. BARTLETT, Associate Professor Emeritus of Psychology
STEVEN C. BASS, Professor Emeritus of Computer Science and Engineering
SUBHASH C. BASU, Professor of Chemistry and Biochemistry
STEPHEN M. BATILL, Professor of Aerospace and Mechanical Engineering, and Associate Dean for Educational Programs, College of Engineering
PETER H. BAUER, Professor of Electrical Engineering
REV. MICHAEL J. BAXTER, C.S.C., Assistant Professor of Theology
TIMOTHY J. BAYS, Assistant Professor of Philosophy
EDWARD N. BEATTY, Assistant Professor of History, Fellow, Kellogg Institute for International Studies
FREDERICK S. BECKMAN, Professor Emeritus of Art, Art History, and Design
GAIL BENDERMAN, Associate Professor of History
REV. PAUL E. BEICHER, C.S.C., Professor Emeritus of English
GARY E. BELOVSKY, Gillen director of UNDREC and Professor of Biological Sciences
HARVEY A. BENDER, Professor of Biological Sciences
DAVID P. BENNETT, Research Associate Professor of Physics
CINDY BERGEMAN, Associate Professor of Psychology, Associate Dean of Research and Director of the Institute for Scholarship in the Liberal Arts
DORIS BERGEN, Associate Professor of History and Fellow, Joan B. Kroc Institute for International Peace Studies
JEFFREY H. BERGSTRAND, Associate Professor of Finance and Business Economics, Fellow in the Helen Kellogg Institute for International Studies, and Fellow in the Joan B. Kroc Institute for International Peace Studies
GARY H. BERNSTEIN, Professor of Electrical Engineering
H. GORDON BERRY, Professor of Physics
WILLIAM B. BERRY, Professor of Electrical Engineering
NORA J. BESANSKY, Associate Professor of Biological Sciences
KATHLEEN A. BIDDICK, Professor of History
IKAROS BIGI, Professor of Physics
JAMES M. BISHOP, Research Professor of Physics
ALEXANDER BLANCHLY, Professor of Music
HOWARD A. BLACKSTEAD, Professor of Physics
PATRICIA BLANCHETTE, Associate Professor of Philosophy
REV. THOMAS E. BLANTZ, C.S.C., Professor of History
JOSEPH BOBICK, Professor of Philosophy
STEVEN M. BOKER, Assistant Professor of Psychology
FRANCESCA BORDOGNA, Assistant Professor of Liberal Studies
MARIO BORELLI, Associate Professor of Mathematics and Director of Special Instructional Projects and Activities
JOHN G. BORKOWSKI, Andrew J. McKenna Family Professor of Psychology
PAUL F. BOSCO, Associate Professor Emeritus of Romance Languages and Literatures
SAMIR K. BOSE, Professor of Physics
RUDOLPH S. BOTTEI, Assistant Chairperson of the Department of Philosophy
REV. WILLIAM A. BOTZUM, C.S.C., Professor Emeritus of Psychology
DEAN M. BOULTON, Professional Specialist and Concurrent Associate Professor of History
MAUREEN B. MCCANN BOULTON, Professor of Romance Languages and Literatures
CALVIN M. BOWER, Professor of Music
ALAN P. BOWLING, Assistant Professor of Aerospace and Chemical Engineering
SUNNY K. BOYD, Associate Professor of Biological Sciences
RAYMOND M. BRACH, Professor of Aerospace and Mechanical Engineering
GERARD V. BRADLEY, Professor of Law
KEITH R. BRADLEY, Eli J. Shabazz Professor of Classics
REV. PAUL F. BRADSHAW, Professor of Theology
ROBERT J. BRANDT, Professional Specialist in Architecture
MATTHEW J. DYER, Associate Professor of Mathematics
KATHLEEN EBERHARD, Assistant Professor of Psychology
RICHARD M. ECONOMAKIS, Assistant Professor of Architecture
KEITH J. EGAN, Adjunct Professor of Theology and Chairperson of Religious Studies at Saint Mary's College
REV. VIRGILIO P. ELIZONDO, Visiting Professor of Theology, Associate Director of Latino Theology and Pastoral Concerns, and Fellow, Helen Kellogg Institute for International Studies
KENT EMERY JR., Professor of Liberal Studies
SAMUEL R. EVANS, Associate Professor of Mathematics
STEPHEN M. FALCON, Associate Professor of Liberal Studies and Concurrent Associate Professor of English
ANDREW PRATHER FARLEY, Director of the Spanish Language Program Assistant Professor of Romance Languages and Literatures
PATRICK J. FAY, Assistant Professor of Electrical Engineering
LEONID FAYBUSOVICH, Professor of Mathematics
JEFFREY L. FEDER, Associate Professor of Biological Sciences
THOMAS P. FEHLMANN, Grace-Rupley Professor of Chemistry
JEREMY B. FEIN, Associate Professor of Civil Engineering and Geological Sciences
MICHAEL T. FERDIG, Assistant Professor of Biological Sciences
ISABEL A. FERREIRA, Instructor in Portuguese and Brazilian Studies
BARBARA J. FICK, Associate Professor of Law and Fellow in the Joan B. Kroc Institute for International Peace Studies
JANET FISHER-MCPEAK, Assistant Professional Specialist and Concurrent Lecturer in Romance Languages and Literatures
ROBERT M. FISHMAN, Associate Professor of Sociology and Fellow in the Helen Kellogg Institute for International Studies
REV. JAMES F. FLANIGAN, C.S.C., Associate Professor of Art, Art History and Design
THOMAS J. FLYNN, Assistant Professor of Philosophy
PATRICK J. FLINT, Assistant Professor of Computer Science and Engineering
JOSEPH C. FREELAND, Associate Professor of Computer Science and Engineering
JOSEPH C. FREDO, Professor of English
VINCENT W. FREEH, Assistant Professor of Computer Science and Engineering
JOSEPH C. FREEDLAND, Assistant Professor of Computer Science and Engineering
DOLORES WARWICK FRESE, Professor of English
GARY B. FROMM, Adjunct Assistant Professor of Biological Sciences
THOMAS E. FUJITA, Professor of Electrical Engineering
JACEK K. FURDYNA, Aurora and Tom Marquez Professor of Physics
ABBOT ASTRIK L. GABRIEL, Director and Professor Emeritus in the Medieval Institute and Director of the Frank M. Folsom Ambrosiana Microfilm and Photographic Collection
GARRET J. GABRIEL, Associate Professor Emeritus of Electrical Engineering
MOHAMED GAD-EL-HAK, Professor of Aerospace and Mechanical Engineering
REV. PATRICK D. GAFFNEY, C.S.C., Acting Director of Mediterranean/Middle East Studies Program, Associate Professor of Anthropology, Fellow in the Helen Kellogg Institute for International Studies, and Fellow in the Joan B. Kroc Institute for International Peace Studies
LUIS N. GALUP, Adjunct Associate Professor of Biological Sciences
ALEJANDRO GARCÍA, Grace-Rupley Professor of Physics
UMESH GARG, Professor of Physics
PETER M. GARNAVICH, Assistant Professor of Physics
LIANGYAN GE, Assistant Professor of East Asian Languages and Literatures
MICHAEL GEKHTMAN, Associate Professor of Mathematics
SONIA G. GERNES, Professor of English
STEPHEN E. GERSH, Professor of Medieval Studies
J. DANIEL GEZELTER, Assistant Professor of Chemistry
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
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<tbody>
<tr>
<td>HOWARD P. LOUTHAN</td>
<td>Assistant Professor of History</td>
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<tr>
<td>MICHAEL J. LOUX</td>
<td>Associate Professor of Aerospace and Mechanical Engineering</td>
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<tr>
<td>SEMION LYANDRES</td>
<td>Assistant Professor of History</td>
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<tr>
<td>MICHAEL N. LYKOUSIS</td>
<td>Associate Chairperson and Associate Professor of Architecture</td>
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<tr>
<td>MONIKA LYNKER</td>
<td>Guest Assistant Professor of Physics</td>
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<td>ALASDAIR C. MACINTYRE</td>
<td>Research Professor of Philosophy</td>
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<td>LOUIS A. MACKENZIE JR.</td>
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<td>GREGORY RICHARD MADEY</td>
<td>Professional Specialist in Computer Science and Engineering</td>
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<td>SCOTT P. MAINWARING</td>
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<td>EDWARD MANIER</td>
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<td>Chairperson and Professor of Government and International Studies, Fellow in the Joan B. Kroc Institute for International Peace Studies, and Fellow in the Helen Kellogg Institute for International Studies</td>
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<td>REV. RICHARD P. MCBRIEN</td>
<td>Crowley-O'Brien-Walter Professor of Theology</td>
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<td>S.M., Coordinator of the John S. Marten Program in Homiletics and Liturgics and Professional Specialist in Theology</td>
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<td>Professor of Law and Director of the Center for Civil and Human Rights</td>
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<td>THOMAS J. MUELLER</td>
<td>Roth-Gibson Professor of Aerospace Engineering</td>
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<td>VAI-LAM MUI</td>
<td>Associate Professor of Economics</td>
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<tr>
<td>KAJAL MUKHOPADHYAY</td>
<td>Research Assistant Professor and Associate Director in the Laboratory for Social Research and Concurrent Assistant Professor of Economics</td>
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<td>HINDY NAJMAN</td>
<td>The Jordan Kapson Chair in Jewish Studies</td>
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<td>DARCEA FE NARVAEZ</td>
<td>Associate Professor of Psychology</td>
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<tr>
<td>RUDOLPH M. NAVARI M.D.</td>
<td>Associate Dean, College of Science, and Professional Specialist in Pre-Professional Studies</td>
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CLIVE R. NEAL, Associate Professor of Civil Engineering and Geological Sciences
VICTOR W. NEE, Professor Emeritus of Aerospace and Mechanical Engineering
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LIVIU NICOLAESCU, Assistant Professor of Mathematics
GLEN L. NIEBUR, Assistant Professor of Aerospace and Mechanical Engineering
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SAMUEL PAOLUCCI, Professor of Aerospace and Mechanical Engineering
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MARK C. PILKINGTON, Professor of Film, Television, and Theatre
VIBHA PINGLÉ, Assistant Professor of Sociology
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VICTORIA PLOPLIS, Research Associate Professor of Chemistry and Biochemistry
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CLAUDIA POLINI, Assistant Professor of Mathematics
BARTH POLLAK, Professor Emeritus of Mathematics
MORRIS POLLARD, Coleman Director of the Lobund Laboratory and Professor Emeritus of Biological Sciences
REV. MARK POORMAN, C.S.C., Vice President for Student Affairs, Executive Assistant to the President and Associate Professor of Theology
DONALD B. POPE-DAVIS, Professor of Psychology
WOLFGANG POROD, Professor of Electrical Engineering and Director, Center for Nano Science and Technology
DEAN A. PORTER, Concurrent Professor of Art, Art History and Design
JEAN PORTER, John A. O’Brien Professor of Theology
ANN MARIE POWER, Visiting Assistant Professor of Sociology
JOSEPH M. POWERS, Associate Professor of Aerospace and Mechanical Engineering
JOSEPH A. PRAHLOW, Guest Associate Professor of Biological Sciences
GEORGE MICHAEL PRESSLEY, Notre Dame Professor of Catholic Education, Director of the Master of Education Program and Professor of Psychology
VERA B. PROFIT, Professor of German and Russian Languages and Literatures
MARYFRANCES E. PROROK, Research Assistant Professor of Chemistry and Biochemistry
THOMAS PRUEGL, Assistant Professor of Theology
KATHY A. PSOMIADES, Associate Professor of English
KATHLEEN A. PYNE, Director of the Program in Gender Studies and Associate Professor of Economics
PAUL A. RATHBURN, Associate Professor of English and Shakespeare Initiatives
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REV. HERMAN REITH, C.S.C., Associate Professor Emeritus of Philosophy
JOHN E. RENAUD, Associate Professor of Aerospace and Mechanical Engineering
GEOXINE RESICK, Associate Professor of Music
TERRENCE W. RETTIG, Professor of Physics
GRETCHEN J. REYDAMS-SCHILS, Associate Professor of Liberal Studies
ROBIN F. RHODES, Associate Professor of Art, Art History and Design and concurrent professor of Classics
J. KEITH RIGBY JR., Associate Professor of Civil Engineering and Geological Sciences
REV. JAMES A. RIGERT, C.S.C., Associate Professor of Civil Engineering and Geological Sciences
MARLYN T. RITCHIE, Associate Professional Specialist in the Center for the Study of Contemporary Society
JOHN H. ROBINSON, Associate Professor of Law
MARK W. ROCHE, I.A. O’Shaughnessy Dean of the College of Arts and Letters and Rev. Edmund P. Joyce, C.S.C. Concurrent Professor of German and Russian Languages and Literatures
ROBERT E. RODES JR., Paul J. Schierl/Shaughnessy Professor of Legal Ethics and Professor of Law
RYAN ROEDER, Assistant Professor of Aerospace and Mechanical Engineering
JEANNE ROMERO-SEVERSON, Adjunct Assistant Professor of Biological Sciences
L. JOHN ROOS, Professor of Government and International Studies
ROBERT A. VACCIA, Assistant Professor of Classics
J. SAMUEL VALENZUELA, Professor of Sociology and Fellow in the Helen Kellogg Institute for International Studies
JOHN H. VAN ENGEN, Associate Professor Emeritus of Mathematics
PETER VAN INWAGEN, John Cardinal O’Hara Professor of Philosophy
CHRIS R. VANDEN BOSSCHE, Chairperson and Professor of English
VANCE D. VANDERBURG, Adjunct Professor of Physics
JAMES C. VANDERKAM, Rev. John A. O’Brien Professor of Philosophy
JOY VANN-HAMILTON, Assistant Professional Specialist - Assistant Provost
ARVIND VARMA, Director, Center for Molecularly Engineered Materials, and Arthur J. Schimiz Professor of Chemical Engineering
ROBERT H. VASOLI, Associate Professor Emeritus of Philosophy
EDWARD VASTA, Professor Emeritus of English
KEYN T. VAUGHAN, Assistant Professor of Biological Sciences
RAIMO VÄYRYNEN, Professor of Government and International Studies and Senior Fellow at the Joan B. Kroc Institute for International Peace Studies
ANRE VENTER, Associate Professional Specialist in Psychology
STEVEN M. VINSON, Visiting Assistant Professor
VLADETA VUCKOVIC, Associate Professor Emeritus of Mathematics
DAVID L. WALDSTREICHER, Associate Professor of Government and International Studies
ANDRZEJ WALICKI, Professor Emeritus of History
MARK M. WALSH, Adjunct Assistant Professor of Biological Sciences
A. PETER WALSH, Professor of Government and International Studies and Fellow in the Joan B. Kroc Institute for International Peace Studies
REV. JOSEPH L. WALTER, C.S.C., Chairperson of Preprofessional Studies and Associate Professor of Chemistry and Biochemistry
JAMES H. WALTON, Professor of English
BARBARA E. WALVOORD, Director and Professional Specialist in the John A. Kaneb Center for Teaching and Learning and Concurrent Professor of English
MARGARET B. WAN, Visiting Assistant Professor of East Asian Languages and Literatures
JADWIGA WARCHOL, Research Professor of Physics
TED A. WARFIELD, Associate Professor of Philosophy
STEPHEN H. WATSON, Chairperson and Professor of Philosophy
JOSEPH P. WAWRYKOW, Associate Professor of Philosophy
MITCHELL R. WAYNE, Assistant Chairperson and Professor of Physics
FRIDOLIN WEBER, Visiting Professor of Physics
J. ROBERT WEGS, Professor of History, Director of the Nanovic Institute for European Studies, and Fellow in the Helen Kellogg Institute for International Studies
ANDREW J. WEIGERT, Professor of Sociology and Fellow in the Joan B. Kroc Institute for International Peace Studies
REV. CHARLES WEIHER, C.S.C., Assistant Professor Emeritus of Philosophy
REV. JOSEPH E. WEISS, S.J., Associate Professional Specialist and Acting Administrative Director, Institute for Church Life, and Concurrent Associate Professional Specialist in Theology
PAUL J. WEITHMAN, Associate Professor of Philosophy
MICHAEL R. WELCH, Chairperson and Associate Professor of Sociology
JOHN P. WELLE, Associate Professor of Romance Languages and Literatures
CHRISTOPHER J. WELNA, Associate Director and Professional Specialist in the Kellogg Institute for International Studies and Concurrent Assistant Professor of Government and International Studies
JOELLEN JONES WELSH, Professor of Biological Sciences
MICHAEL J. WENGERT, Assistant Professor of Psychology
THOMAS A. WERGE, Professor of English and Concurrent Professor in Master of Education Program
ROBERT L. WEST, Assistant Professor of Psychology
JOANNE J. WESTERINK, Associate Professor of Civil Engineering and Geological Sciences
C. WILLIAM WESTFALL, Chairperson and Francesco Montana Professor of Architecture
REV. JAMES F. WHITE, Professor Emeritus of Theology
THOMAS L. WHITMAN, Professor of Psychology
TODD D. WHITMORE, Associate Professor of Theology
JOHN J. OHARA JR., Senior Associate Dean for Academic Affairs, College of Engineering Professor of Computer Science and Engineering
EUGÈNE C. ULRICH, Rev. John A. O’Brien Professor of Philosophy
JAMES R. WILSON, Adjunct Professor of Physics
ALBERT K. WIMMER, Associate Professor of German and Russian Languages and Literatures
REV. GEORGE WISKIRCHEN, C.S.C., Assistant Professor of Music and Associate Professional Specialist in Music
CHRISTINÁ WOLBRECHT, Assistant Professor of Government and International Studies
EDUARDO E. WOLF, Professor of Chemical Engineering
MARTIN H. WOLFSON, Associate Professor of Economics
PIT-MANN WONG, Professor of Mathematics
WARREN J. WONG, Professor of Mathematics
FREDERICO J. XAVIER, Professor of Mathematics
DAVID A. YAMANE, Assistant Professor of Sociology
KWANG-TZU YANG, Viola D. Hank Professor Emeritus of Aerospace and Mechanical Engineering
XIAOSHAN YANG, Assistant Professor of East Asian Languages and Literatures
CHENGXU YIN, Assistant Professional Specialist in East Asian Languages and Literatures
SAMIR YOUNÉS, Associate Professor of Architecture and Director of the School of Architecture Rome Studies Program
KE-HAI YUAN, Associate Professor of Psychology
RANDALL C. ZACHMAN, Associate Professor of Theology
EWA ZIAREK, Associate Professor of English
KRZYSZTOF ZIAREK, Associate Professor of English
CATHERINE ZUCKERT, Nancy Reves Dreux Professor of Government and International Studies
MICHAEL P. ZUCKERT, Acting Chair and Nancy Reves Dreux Professor of Government and International Studies
## Academic Calendar 2001–2002

### Fall Semester 2001

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 24</td>
<td>Enrollment and registration for new students</td>
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<tr>
<td>Aug. 27</td>
<td>Enrollment for continuing students</td>
</tr>
<tr>
<td>Aug. 28</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Aug. 28</td>
<td>Mass—formal opening of school year</td>
</tr>
<tr>
<td>Oct. 20–28</td>
<td>Midsemester break</td>
</tr>
<tr>
<td>Oct. 29</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Nov. 1</td>
<td>Application deadline for admission to the Graduate School for spring semester 2002</td>
</tr>
<tr>
<td>Nov. 2</td>
<td>Last day for course discontinuance</td>
</tr>
<tr>
<td>Nov. 14–</td>
<td>Registration for spring semester 2002</td>
</tr>
<tr>
<td>Dec. 7</td>
<td></td>
</tr>
<tr>
<td>Nov. 22–25</td>
<td>Thanksgiving holiday</td>
</tr>
<tr>
<td>Nov. 26</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Nov. 30</td>
<td>Last day for application for admission to the Graduate School for the doctor’s or master’s degree in January 2002 and Ph.D. dissertation defenses for graduation in January 2002</td>
</tr>
<tr>
<td>Dec. 7</td>
<td>Last day for presenting completed theses and dissertations in the Graduate School office for graduation in January 2002</td>
</tr>
<tr>
<td>Dec. 11</td>
<td>Last class day</td>
</tr>
<tr>
<td>Dec. 12–13</td>
<td>Study days</td>
</tr>
<tr>
<td>Dec. 14–15</td>
<td>Final examinations</td>
</tr>
<tr>
<td>Dec. 22</td>
<td>All grades due in Registrar’s office by 3:00 p.m.</td>
</tr>
<tr>
<td>Jan. 6</td>
<td>January graduation date (no ceremony)</td>
</tr>
</tbody>
</table>

### Spring Semester 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan. 14</td>
<td>Enrollment, orientation, and registration for new and continuing students</td>
</tr>
<tr>
<td>Jan. 15</td>
<td>Classes begin</td>
</tr>
<tr>
<td>Feb. 1</td>
<td>Deadline for applying to the Graduate School for fall semester 2002 admission and financial aid</td>
</tr>
<tr>
<td>Mar. 9–17</td>
<td>Midsemester break</td>
</tr>
<tr>
<td>Mar. 18</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Mar. 22</td>
<td>Last day for course discontinuance</td>
</tr>
<tr>
<td>Apr. 12</td>
<td>Last day for application for admission to candidacy for the doctor’s or master’s degree in May or August 2002 and Ph.D. dissertation defenses for graduation in May 2002</td>
</tr>
<tr>
<td>Mar. 29–</td>
<td></td>
</tr>
<tr>
<td>Apr. 1</td>
<td>Easter holiday</td>
</tr>
<tr>
<td>Apr. 2</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Apr. 8–23</td>
<td>Registration for fall semester 2002</td>
</tr>
<tr>
<td>Apr. 19</td>
<td>Last day for presenting completed theses and dissertations in the Graduate School office for graduation in May 2002</td>
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<tr>
<td>May 1</td>
<td>Last class day</td>
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<tr>
<td>May 2–5</td>
<td>Study days</td>
</tr>
<tr>
<td>May 6–10</td>
<td>Final examinations</td>
</tr>
<tr>
<td>May 14</td>
<td>All grades due in Registrar’s office by 3:00 p.m.</td>
</tr>
<tr>
<td>May 17</td>
<td>Graduate School reception for Ph.D. and master’s degree candidates and their guests</td>
</tr>
<tr>
<td>May 17–19</td>
<td>Commencement weekend</td>
</tr>
</tbody>
</table>

### Summer Session 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>June 17</td>
<td>Enrollment</td>
</tr>
<tr>
<td>June 18</td>
<td>Classes begin</td>
</tr>
<tr>
<td>July 5</td>
<td>Last day for master’s examinations and Ph.D. dissertation defenses for graduation in August 2002</td>
</tr>
<tr>
<td>July 12</td>
<td>Last day for presenting completed theses and dissertations in the Graduate School office for graduation in August 2002</td>
</tr>
<tr>
<td>Aug. 1</td>
<td>Last class day</td>
</tr>
<tr>
<td>Aug. 2</td>
<td>Final examinations</td>
</tr>
<tr>
<td>Aug. 7</td>
<td>August graduation date (no ceremony)</td>
</tr>
</tbody>
</table>
## Academic Calendar 2002–2003

### Fall Semester 2002

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 25</td>
<td>Enrollment and registration for new students</td>
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<td>Aug. 26</td>
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</tr>
<tr>
<td>Oct. 19–27</td>
<td>Midsemester break</td>
</tr>
<tr>
<td>Oct. 28</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Nov. 1</td>
<td>Application deadline for admission to the Graduate School for spring semester 2003</td>
</tr>
<tr>
<td>Nov. 1</td>
<td>Last day for course discontinuance</td>
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<tr>
<td>Nov. 13–Dec. 6</td>
<td>Registration for spring semester 2003</td>
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<tr>
<td>Nov. 27</td>
<td>Last day for application for admission to candidacy for the doctor’s or master’s degree in January 2003</td>
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<tr>
<td>Nov. 28–Dec. 1</td>
<td>Thanksgiving holiday</td>
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<tr>
<td>Dec. 2</td>
<td>Classes resume</td>
</tr>
<tr>
<td>Dec. 6</td>
<td>Last day for presenting completed theses and dissertations in the Graduate School office for graduation in January 2003</td>
</tr>
<tr>
<td>Dec. 11</td>
<td>Last class day</td>
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<tr>
<td>Dec. 12–15</td>
<td>Study days</td>
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<tr>
<td>Dec. 16–20</td>
<td>Final examinations</td>
</tr>
<tr>
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<td>All grades due in Registrar’s office by 3:45 p.m.</td>
</tr>
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### Spring Semester 2003

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Jan. 13</td>
<td>Enrollment, orientation, and registration for new and continuing students</td>
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<tr>
<td>Jan. 14</td>
<td>Classes begin</td>
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<td>Feb. 1</td>
<td>Deadline for applying to the Graduate School for fall semester 2003 admission and financial aid</td>
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<td>Mar. 8–16</td>
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<td>Apr. 22</td>
<td>Classes resume</td>
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<tr>
<td>Apr. 30</td>
<td>Last class day</td>
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<tr>
<td>May 1–4</td>
<td>Study days</td>
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<tr>
<td>May 5–9</td>
<td>Final examinations</td>
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<tr>
<td>May 13</td>
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</tr>
<tr>
<td>May 16</td>
<td>Graduate School reception for Ph.D. and master’s degree candidates and their guests</td>
</tr>
<tr>
<td>May 16–18</td>
<td>Commencement weekend</td>
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### Summer Session 2003

<table>
<thead>
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<th>Date</th>
<th>Event</th>
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<tr>
<td>June 16</td>
<td>Enrollment</td>
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<td>June 17</td>
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<td>Aug. 1</td>
<td>Final examinations</td>
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<tr>
<td>Aug. 6</td>
<td>August graduation date (no ceremony)</td>
</tr>
<tr>
<td>Building Name</td>
<td>Room Number</td>
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<tr>
<td>Admissions (Main Building)</td>
<td>36</td>
</tr>
<tr>
<td>Alumni Association</td>
<td>520</td>
</tr>
<tr>
<td>Alumni Hall</td>
<td>23</td>
</tr>
<tr>
<td>Alumni-Senior Club</td>
<td>91</td>
</tr>
<tr>
<td>Architecture</td>
<td>14</td>
</tr>
<tr>
<td>Art Gallery</td>
<td>54</td>
</tr>
<tr>
<td>Athletic and Convocation Center</td>
<td>79</td>
</tr>
<tr>
<td>Ave Maria Press</td>
<td>410</td>
</tr>
<tr>
<td>Badin Hall</td>
<td>18</td>
</tr>
<tr>
<td>Band Building</td>
<td>210</td>
</tr>
<tr>
<td>Basilica of the Sacred Heart</td>
<td>29</td>
</tr>
<tr>
<td>Bond Hall (Architecture)</td>
<td>14</td>
</tr>
<tr>
<td>(Hamman Notre Dame) Bookstore</td>
<td>521</td>
</tr>
<tr>
<td>Breen-Phillips Hall</td>
<td>58</td>
</tr>
<tr>
<td>Brownson Hall</td>
<td>94</td>
</tr>
<tr>
<td>Burke Memorial Golf Course</td>
<td>302</td>
</tr>
<tr>
<td>Campus Security Building</td>
<td>5</td>
</tr>
<tr>
<td>Carroll Hall</td>
<td>1</td>
</tr>
<tr>
<td>Cartier Field</td>
<td>303</td>
</tr>
<tr>
<td>Cavanaugh Hall</td>
<td>51</td>
</tr>
<tr>
<td>Center for Continuing Education McKenna Hall</td>
<td>81</td>
</tr>
<tr>
<td>Center for Social Concerns</td>
<td>70</td>
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<tr>
<td>Clarke Memorial Fountain</td>
<td>301</td>
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<tr>
<td>Coleman-Morse Center</td>
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</tr>
<tr>
<td>Columba Hall</td>
<td>30</td>
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<tr>
<td>Computing and Mathematics Building</td>
<td>74</td>
</tr>
<tr>
<td>Corby Hall</td>
<td>27</td>
</tr>
<tr>
<td>Courtney Tennis Center</td>
<td>304</td>
</tr>
<tr>
<td>(Notre Dame) Credit Union</td>
<td>106</td>
</tr>
<tr>
<td>Crowley Hall of Music</td>
<td>42</td>
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<tr>
<td>Cushing Hall of Engineering</td>
<td>40</td>
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<tr>
<td>DeBaltrato Hall</td>
<td>150</td>
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<tr>
<td>Decio Faculty Hall</td>
<td>83</td>
</tr>
<tr>
<td>Dillon Hall</td>
<td>20</td>
</tr>
<tr>
<td>Early Childhood Development Center</td>
<td>100</td>
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<tr>
<td>Earth Sciences Building</td>
<td>77</td>
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<tr>
<td>East Gate</td>
<td>206</td>
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<tr>
<td>Eck Baseball Stadium</td>
<td>204</td>
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<tr>
<td>Eck Center</td>
<td>520/521</td>
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<tr>
<td>Eck Tennis Pavilion</td>
<td>208</td>
</tr>
<tr>
<td>Edison House</td>
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<tr>
<td>Facilities Building</td>
<td>310</td>
</tr>
<tr>
<td>Facilities/Maintenance Center</td>
<td>67</td>
</tr>
<tr>
<td>Farley Hall</td>
<td>59</td>
</tr>
<tr>
<td>Fatima Retreat House and Shrine</td>
<td>3</td>
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<tr>
<td>Fieldhouse Mall</td>
<td>301</td>
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<tr>
<td>Fire Station</td>
<td>62</td>
</tr>
<tr>
<td>First Year of Studies</td>
<td>28</td>
</tr>
<tr>
<td>Fisher Graduate Community Center FG35</td>
<td>91</td>
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<tr>
<td>Fisher Graduate Residences FG01-FG33</td>
<td>39</td>
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<tr>
<td>Fisher Hall</td>
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<tr>
<td>FitzPatrick Hall of Engineering</td>
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<tr>
<td>Flanner Hall</td>
<td>89</td>
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<tr>
<td>Food Services Support Facility</td>
<td>407</td>
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<tr>
<td>Football Stadium</td>
<td>73</td>
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<tr>
<td>Freimann Life Science Center</td>
<td>84</td>
</tr>
<tr>
<td>Galvin Life Science Center</td>
<td>84</td>
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<tr>
<td>Golf Courses</td>
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<td>Burke Memorial Golf Course</td>
<td>302</td>
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<tr>
<td>Warren Golf Course</td>
<td>450</td>
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<tr>
<td>Grace Hall</td>
<td>90</td>
</tr>
<tr>
<td>Grotto of Our Lady of Lourdes</td>
<td>300</td>
</tr>
<tr>
<td>Haggar Fitness Complex</td>
<td>309</td>
</tr>
<tr>
<td>Haggar Hall</td>
<td>61</td>
</tr>
<tr>
<td>Hamman Notre Dame Bookstore</td>
<td>521</td>
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<tr>
<td>Hank Family Center for Environmental Sciences</td>
<td>86</td>
</tr>
<tr>
<td>Hesburgh Center for International Studies</td>
<td>156</td>
</tr>
<tr>
<td>Hesburgh Library</td>
<td>72</td>
</tr>
<tr>
<td>Hesbert Aerospace Research Center</td>
<td>66</td>
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<tr>
<td>Holy Cross House</td>
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<td>Howard Hall</td>
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<td>Huddle</td>
<td>43</td>
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<tr>
<td>Hurley</td>
<td>41</td>
</tr>
<tr>
<td>Isis Gallery (Riley Hall of Art and Design)</td>
<td>53</td>
</tr>
<tr>
<td>Joyce Center Joyce Athletic and Convocation Center</td>
<td>79</td>
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<tr>
<td>Keenan Hall</td>
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<td>Keough Hall</td>
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<td>Knights of Columbus Council Hall</td>
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<td>Knott Hall</td>
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<tr>
<td>Lafortune Student Center</td>
<td>43</td>
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<tr>
<td>(St. Michael’s) Laundry</td>
<td>401</td>
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<tr>
<td>Laundry Pick-up Center</td>
<td>96</td>
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<tr>
<td>Law School</td>
<td>37</td>
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<td>Lewis Hall</td>
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<td>(Hesburgh) Library</td>
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<td>Lyons Hall</td>
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<td>Malloy Hall</td>
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<td>Mason Support Services Center</td>
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</tr>
<tr>
<td>McGlinn Hall</td>
<td>513</td>
</tr>
<tr>
<td>McKenna Hall (Center for Continuing Education)</td>
<td>81</td>
</tr>
<tr>
<td>Mendoza College of Business</td>
<td>152</td>
</tr>
<tr>
<td>Meyo Field</td>
<td>309</td>
</tr>
<tr>
<td>Moreau Seminary</td>
<td>32</td>
</tr>
<tr>
<td>Morris Inn</td>
<td>21</td>
</tr>
<tr>
<td>Morrissey Hall</td>
<td>10</td>
</tr>
<tr>
<td>Nieuwland Science Hall</td>
<td>52</td>
</tr>
<tr>
<td>North Dining Hall</td>
<td>60</td>
</tr>
<tr>
<td>Notre Dame Credit Union</td>
<td>106</td>
</tr>
<tr>
<td>O’Hara-Grace Graduate Residences</td>
<td>97</td>
</tr>
<tr>
<td>O’Neill Hall</td>
<td>511</td>
</tr>
<tr>
<td>O'Shaughnessy Hall</td>
<td>56</td>
</tr>
<tr>
<td>Pangborn Hall</td>
<td>7</td>
</tr>
<tr>
<td>Paris House (Marital Therapy and Research Clinic)</td>
<td>408</td>
</tr>
<tr>
<td>Pasquerilla Center ROTC</td>
<td>211</td>
</tr>
<tr>
<td>Pasquerilla Hall East</td>
<td>64</td>
</tr>
<tr>
<td>Pasquerilla Hall West</td>
<td>76</td>
</tr>
<tr>
<td>Post Office</td>
<td>24</td>
</tr>
<tr>
<td>Power Plant</td>
<td>63</td>
</tr>
<tr>
<td>Presbytery</td>
<td>35</td>
</tr>
<tr>
<td>Province Archives Center</td>
<td>99</td>
</tr>
<tr>
<td>Radiation Research Building</td>
<td>71</td>
</tr>
<tr>
<td>Reckers/Public Cafeteria</td>
<td>17</td>
</tr>
<tr>
<td>Reyniers Life Annex</td>
<td>105</td>
</tr>
<tr>
<td>Reyniers Life Building</td>
<td>68</td>
</tr>
<tr>
<td>Riley Hall of Art and Design</td>
<td>53</td>
</tr>
<tr>
<td>Rockne Memorial</td>
<td>6</td>
</tr>
<tr>
<td>Rolfs Aquatic Center</td>
<td>79</td>
</tr>
<tr>
<td>Rolfs Sports Recreation Center</td>
<td>75</td>
</tr>
<tr>
<td>ROTC (Pasquerilla Center)</td>
<td>211</td>
</tr>
<tr>
<td>(Basilica of the) Sacred Heart</td>
<td>29</td>
</tr>
<tr>
<td>Sacred Heart Parish Center</td>
<td>(St. Joseph) 31</td>
</tr>
<tr>
<td>Security Office</td>
<td>5</td>
</tr>
<tr>
<td>Sesquicentennial Common</td>
<td>299</td>
</tr>
<tr>
<td>Shaheen Mestrovic Memorial</td>
<td>307</td>
</tr>
<tr>
<td>Siegfried Hall</td>
<td>209</td>
</tr>
<tr>
<td>Snite Museum of Art</td>
<td>54</td>
</tr>
<tr>
<td>Solitude of St. Joseph (Columbia Hall)</td>
<td>30</td>
</tr>
<tr>
<td>Sorin Hall</td>
<td>26</td>
</tr>
<tr>
<td>South Dining Hall</td>
<td>17</td>
</tr>
<tr>
<td>St. Edward’s Hall</td>
<td>45</td>
</tr>
<tr>
<td>St. Michael’s Laundry</td>
<td>401</td>
</tr>
<tr>
<td>(Football) Stadium</td>
<td>73</td>
</tr>
<tr>
<td>Stanford Hall</td>
<td>48</td>
</tr>
<tr>
<td>Stepan Center</td>
<td>69</td>
</tr>
<tr>
<td>Stepan Chemistry Hall</td>
<td>16</td>
</tr>
<tr>
<td>Student Center</td>
<td>43</td>
</tr>
<tr>
<td>Tennis Courts</td>
<td>304</td>
</tr>
<tr>
<td>University Club</td>
<td>78</td>
</tr>
<tr>
<td>University Health Services</td>
<td>46</td>
</tr>
<tr>
<td>University Village</td>
<td>4</td>
</tr>
<tr>
<td>(Eck) Visitors’ Center</td>
<td>520</td>
</tr>
<tr>
<td>Walsh Hall</td>
<td>25</td>
</tr>
<tr>
<td>Warren Golf Club House</td>
<td>452</td>
</tr>
<tr>
<td>Warren Golf Course</td>
<td>450</td>
</tr>
<tr>
<td>Washington Hall</td>
<td>44</td>
</tr>
<tr>
<td>Water Tower</td>
<td>308</td>
</tr>
<tr>
<td>Welsh Hall</td>
<td>512</td>
</tr>
<tr>
<td>Wilson Commons</td>
<td>98</td>
</tr>
<tr>
<td>WNDU Radio and Television</td>
<td>22</td>
</tr>
<tr>
<td>Zahm Hall</td>
<td>50</td>
</tr>
</tbody>
</table>
The Michiana Regional Transportation Center provides from one location services for travel by air, train, bus and rental car, including the South Shore Railroad, an electric commuter train to Chicago. South Bend is also served by Amtrak. The city lies about 90 miles east of Chicago, Illinois, 140 miles north of Indianapolis, Indiana, and 200 miles west of Detroit, Michigan.
<table>
<thead>
<tr>
<th>Index</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philosophy of Religion, Center for</td>
<td>30</td>
</tr>
<tr>
<td>Physics</td>
<td>150</td>
</tr>
<tr>
<td>Policies</td>
<td></td>
</tr>
<tr>
<td>on Harassment and Other Aspects of Student Life</td>
<td>20</td>
</tr>
<tr>
<td>Postdoctoral Research Associates</td>
<td>8</td>
</tr>
<tr>
<td>Psychological Counseling Services</td>
<td>18</td>
</tr>
<tr>
<td>Psychology</td>
<td>184</td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Radiation Laboratory</td>
<td>40</td>
</tr>
<tr>
<td>Reilly Center for Science, Technology and Values</td>
<td>40</td>
</tr>
<tr>
<td>Requirements</td>
<td></td>
</tr>
<tr>
<td>for Doctoral Programs</td>
<td>12</td>
</tr>
<tr>
<td>for Master’s Programs</td>
<td>11</td>
</tr>
<tr>
<td>Research Assistantships</td>
<td>23</td>
</tr>
<tr>
<td>Research Opportunities and Support</td>
<td>16</td>
</tr>
<tr>
<td>Research Support</td>
<td>23</td>
</tr>
<tr>
<td>Reserve Office Training Corps (ROTC), Army</td>
<td>23</td>
</tr>
<tr>
<td>Residency Requirements</td>
<td></td>
</tr>
<tr>
<td>for Doctoral Programs</td>
<td>12</td>
</tr>
<tr>
<td>for Master’s Programs</td>
<td>11</td>
</tr>
<tr>
<td>Retreats International</td>
<td>33</td>
</tr>
<tr>
<td>Romance Languages and Literatures</td>
<td>117</td>
</tr>
<tr>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Satellite Theological Education Program</td>
<td>33</td>
</tr>
<tr>
<td>Scholarships, Tuition</td>
<td>23</td>
</tr>
<tr>
<td>Science, Division of</td>
<td>136</td>
</tr>
<tr>
<td>History and Philosophy of</td>
<td>89</td>
</tr>
<tr>
<td>Snite Museum of Art</td>
<td>15</td>
</tr>
<tr>
<td>Social Concerns, Center for</td>
<td>33</td>
</tr>
<tr>
<td>Social Research Laboratory for</td>
<td>38</td>
</tr>
<tr>
<td>Social Sciences, Division of</td>
<td>167</td>
</tr>
<tr>
<td>Sociology</td>
<td>193</td>
</tr>
<tr>
<td>South Bend Center for Medical Education</td>
<td>42</td>
</tr>
<tr>
<td>Spanish</td>
<td>121</td>
</tr>
<tr>
<td>Spirit of Inclusion at Notre Dame</td>
<td>20</td>
</tr>
<tr>
<td>Student Employment</td>
<td>24</td>
</tr>
<tr>
<td>Submission</td>
<td></td>
</tr>
<tr>
<td>of the Doctoral Dissertation</td>
<td>13</td>
</tr>
<tr>
<td>of the Master’s Thesis</td>
<td>11</td>
</tr>
<tr>
<td>Support, Other Sources of</td>
<td>23</td>
</tr>
<tr>
<td>T</td>
<td></td>
</tr>
<tr>
<td>Teaching (see Master of Education)</td>
<td>200</td>
</tr>
<tr>
<td>Teaching and Learning, Kaneb Center for</td>
<td>35</td>
</tr>
<tr>
<td>Teaching and Research Faculty</td>
<td>204</td>
</tr>
<tr>
<td>Teaching Scholars</td>
<td>8</td>
</tr>
<tr>
<td>Test of English as a Foreign Language (TOEFL)</td>
<td>7</td>
</tr>
<tr>
<td>Theology</td>
<td>124</td>
</tr>
<tr>
<td>Thesis</td>
<td></td>
</tr>
<tr>
<td>Directors</td>
<td>11</td>
</tr>
<tr>
<td>Requirements</td>
<td>11</td>
</tr>
<tr>
<td>Transfer Credits</td>
<td>10</td>
</tr>
<tr>
<td>Transgene Research</td>
<td></td>
</tr>
<tr>
<td>Keck Center for</td>
<td>35</td>
</tr>
<tr>
<td>Tropical Disease Research and Training Center for</td>
<td>30</td>
</tr>
<tr>
<td>Tuition</td>
<td>20</td>
</tr>
<tr>
<td>Tuition Scholarships</td>
<td>23</td>
</tr>
<tr>
<td>U</td>
<td></td>
</tr>
<tr>
<td>Unclassified Student</td>
<td>7</td>
</tr>
<tr>
<td>University Counseling Center</td>
<td>18</td>
</tr>
<tr>
<td>University Fellowships</td>
<td>22</td>
</tr>
<tr>
<td>University Libraries</td>
<td>14</td>
</tr>
<tr>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Visiting Research Students</td>
<td>8</td>
</tr>
<tr>
<td>Visiting Scholars</td>
<td>8</td>
</tr>
<tr>
<td>Visiting Student</td>
<td>7</td>
</tr>
<tr>
<td>Vocare, The Notre Dame Vocation Initiative</td>
<td>34</td>
</tr>
<tr>
<td>W</td>
<td></td>
</tr>
<tr>
<td>Walther Cancer Research Center</td>
<td>42</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>9</td>
</tr>
<tr>
<td>Withdrawal Regulation</td>
<td>21</td>
</tr>
</tbody>
</table>
# GRE Subject Test Requirements

The following is a list of the graduate programs at the University and the graduate degrees conferred. Please note that the University requires all applicants to take the GRE. Many programs also require the GRE Subject Test.

<table>
<thead>
<tr>
<th>Program</th>
<th>Degrees Offered</th>
<th>Subject Test Required</th>
<th>Subject Test Not Required</th>
<th>Subject Test Not Required But Strongly Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerospace and Mechanical Engineering</td>
<td>M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>M.S.A.M.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Architecture</td>
<td>M.Arch.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Art, Art History, and Design</td>
<td>M.A., M.F.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biochemistry</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological Sciences</td>
<td>M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Chemical Engineering</td>
<td>M.S., Ph.D.</td>
<td></td>
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<td></td>
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<tr>
<td>Chemistry</td>
<td>Ph.D.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Civil Engineering and Geological Sciences†</td>
<td>M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Science and Engineering</td>
<td>M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Creative Writing</td>
<td>M.F.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early Christian Studies</td>
<td>M.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics</td>
<td>M.A., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education (ACE participants only)</td>
<td>M.Ed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>M.A., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>German Language and Literature</td>
<td>M.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government and International Studies</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History and Philosophy of Science</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>M.S.A.M., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medieval Studies</td>
<td>M.M.S., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td>M.A./Mmusic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peace Studies†</td>
<td>M.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ph.D. Program in Literature</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Philosophy</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychology</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Romance Languages and Literatures</td>
<td>M.A.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sociology</td>
<td>Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theology</td>
<td>M.A., M.T.S., M.Div., Ph.D.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Includes Bioengineering and Environmental Engineering

**Separate application required. Contact the Joan B. Kroc Institute for International Peace Studies, Box 639, Notre Dame, IN 46556**

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**Where to write for GRE and TOEFL information:**

- **GRE•ETS**
  - P.O. Box 6000
  - Princeton, NJ 08541-6000
  - U.S.A.

- **TOEFL**
  - P.O. Box 6151
  - Princeton, NJ 08541-6151
  - U.S.A.

GRE and TOEFL application booklets generally are available at U.S. colleges and universities and at U.S. consulates and U.S. Information Services offices abroad. Check with these sources before writing to Princeton.
Correspondence

The University’s address is University of Notre Dame, Notre Dame IN 46556.

The area code for all telephone calls is 219. The University’s main number is 631–5000. The Graduate School’s FAX number is 631–4183 and e-mail is gradsch@nd.edu.

Admissions (Graduate): 502 Main Building (631–7706) gradad@nd.edu

Graduate Studies and Research, Office of: Vice President for Graduate Studies and Research and Dean of the Graduate School, 416 Main Building (631–6291) research@nd.edu

Campus Ministry: 103 Hesburgh Library (631–7800) ministry@nd.edu

Career Development: 248 Flanner Hall (631–5200) ndcareer@nd.edu

Center for Social Concerns: Center for Social Concerns (631–5293 or 5319) ndcntrsc@nd.edu

Counseling Center: University Health Center (631–7336) uhcounseling@nd.edu

Financial Aid: 115 Main Building (631–6436) finaid@nd.edu

Graduate School Office: 502 Main Building (631–6291) gradsch@nd.edu

Graduate Student Union: LaFortune Student Center (631–6963) gsu@nd.edu

Health Services: University Health Center (631–7497 or 7567)

Housing: Student Residences, 305 Main Building on-campus housing (631–5878) off-campus housing (631–5583) University Village (631–9145)

Insurance: Accounts and Insurance, 109 University Health Center (631–6114)

International Student Services and Activities (ISSA): 204 LaFortune Student Center (631–3825)

Library: Director, 221 Hesburgh Library (631–5252)

Registrar: 105 Main Building (631–7043) ndreg@nd.edu

Security: Security Office (631–5555) ndsecurity@nd.edu

Student Accounts: 100 Main Building (631–7113) stdacct@nd.edu

Student Activities: 315 LaFortune Student Center (631–9314) stdactiv@nd.edu

Student Affairs: 316 Main Building (631–5550)

Summer Session: 510 Main Building (631–7282) summer@nd.edu

Departments

The following represent the telephone numbers of the departments, centers, and institutes affiliated with the Graduate School (Prefix: 631).

5430 Aerospace and Mechanical Engineering ame@nd.edu
7997 Applied Mathematics, Center for cam@nd.edu
6137 Architecture architecture@nd.edu
7602 Art, Art History, and Design art@nd.edu
6552 Biological Sciences biosadm@nd.edu
7366 Center for Tropical Disease Research and Training kmerz@nd.edu www.science.nd.edu/biology/programs/tropical enfermedad.html
5580 Chemical Engineering chemdept@nd.edu
7058 Chemistry and Biochemistry chem-biochem.chem.1@nd.edu
5510 Church Life, Institute for chll@nd.edu
5380 Civil Engineering and Geological Sciences cee@nd.edu
8320 Computer Science and Engineering cs@nd.edu
5441 Cushwa Center for the Study of American Catholicism cushwa@nd.edu
7090 Early Christian Studies sleyerle@nd.edu
8873 East Asian Languages and Literatures eall@nd.edu
6335 Economics economics@nd.edu
5482 Electrical Engineering ee@nd.edu
6618 English english@nd.edu
5572 German and Russian Languages and Literatures grr@nd.edu
9017 Government and International Studies gov@nd.edu
7266 History history@nd.edu
5015 History and Philosophy of Science reilly@nd.edu
8294 Institute for Educational Initiatives hallinan@nd.edu
6580 Kellogg Institute for International Studies kellogg@nd.edu
3555 Keough Institute for Irish Studies irish@nd.edu
6070 Kroc Institute for International Peace Studies peaceins@nd.edu
5825 Maritain Center, Jacques maritain@nd.edu
7245 Mathematics math@nd.edu
6603 Medieval Institute medinst@nd.edu
6093 Molecular Biosciences Program biosadm@nd.edu
6211 Music music@nd.edu
5600 Office of Information Technologies info.1@nd.edu www.nd.edu/~ndoit
6841 Office of Multicultural Student Programs and Services omsa@nd.edu
7157 Office for Students with Disabilities osd@nd.edu
5435 Pastoral Liturgy, Notre Dame Center for ndpl@nd.edu
9723 Ph.D. Program in Literature moody.1@nd.edu meissner.1@nd.edu
6471 Philosophy ndphil@nd.edu
7339 Philosophy of Religion, Center for cp@nd.edu
6386 Physics physics@nd.edu
6650 Psychology psych@nd.edu
6163 Radiation Laboratory nrd@nd.edu
8686 Romance Languages and Literatures romlang@nd.edu
5293 Social Concerns, Center for ndcntrsc@nd.edu
7458 Social Research, Laboratory for lsr@nd.edu
6463 Sociology soc@nd.edu
5574 South Bend Center for Medical Education sbcme@nd.edu
4254 Theology—M.A. and M.T.S. Program theo@nd.edu
5682 Theology—M.Div. Program theo@nd.edu
5732 Theology—Ph.D. Program theo@nd.edu

WWW ND Home Page

You can find complete information about all of Notre Dame’s graduate programs online. The URL for the Graduate School’s site on the World Wide Web is www.nd.edu/~gradsch.

To request an application, submit the online inquiry form or send an e-mail message to gradad@nd.edu.

For More Information

For further admissions information, contact:
University of Notre Dame Office of Graduate Admissions 502 Main Building Notre Dame IN 46556–5602 631–7706

Business and Law

Information concerning business and law degrees is obtained by writing or calling: Mendoza College of Business Graduate Division, 631–8488 Notre Dame Law School Office of Admissions, 631–6626