Bulletin of *Information*

UNDERGRADUATE PROGRAMS | 2025—2026

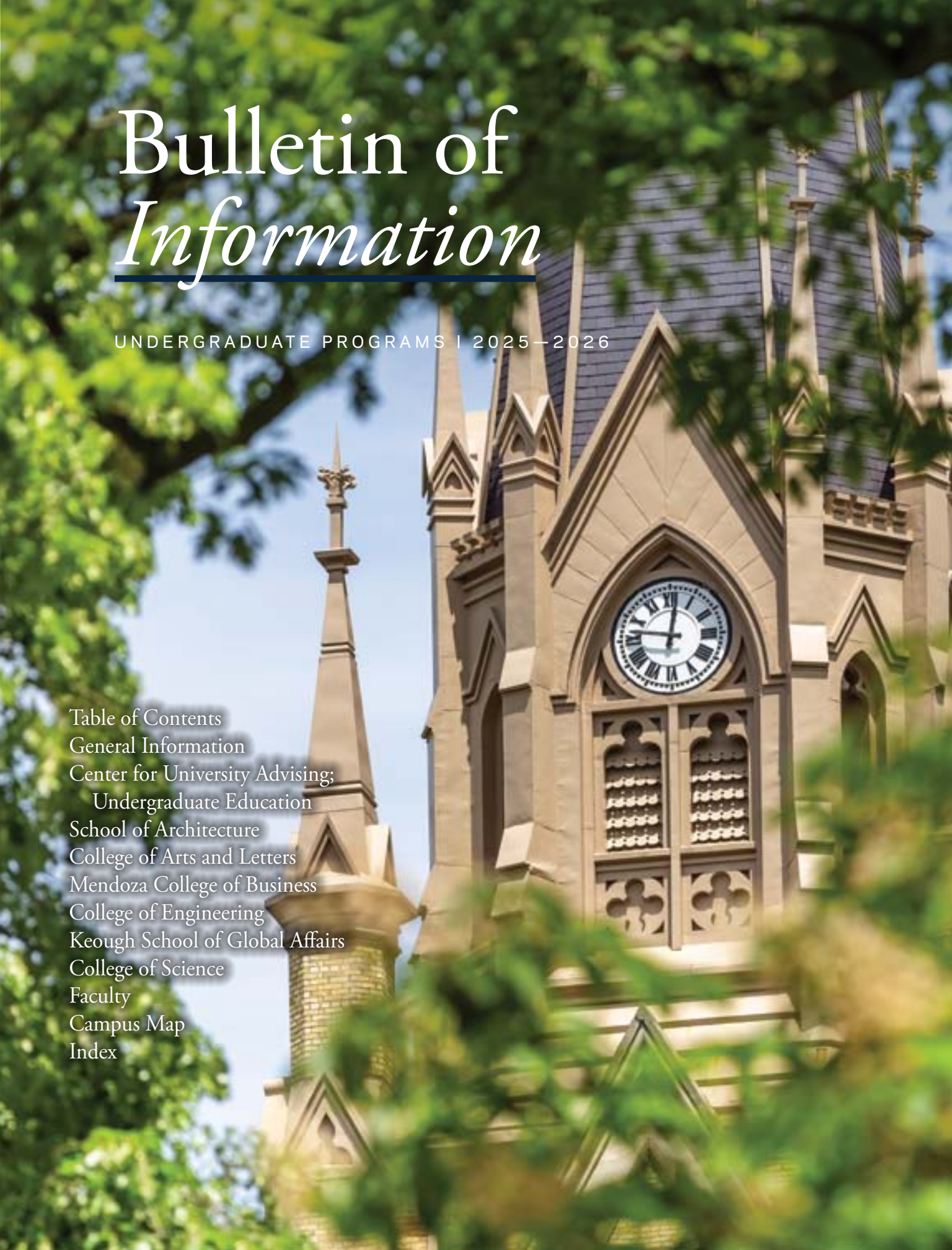


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2025–26
Bulletin of Information
University of Notre Dame
Undergraduate Programs

Vol. 121, No. 2, August 2025
The course offerings and requirements of the University of Notre Dame are continually under examination, and revisions are expected. This *Bulletin of Information* is not a contract; it merely presents the offerings and requirements in effect at the time of publication and in no way guarantees that the offerings and requirements will remain the same. Every effort is made to provide advance information of any changes.

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

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

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

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UNIVERSITY OF NOTRE DAME AND SAINT MARY'S COLLEGE
JOINT ACADEMIC YEAR CALENDAR FOR 2025-2026

FALL 2025 SEMESTER

Aug. 18-19	Mon-Tues	Orientation and advising for new Graduate School students
Aug. 21	Thursday	International Student Orientation for new undergraduates
Aug. 21-24	Thur-Sun	Welcome Weekend for undergraduate transfer students
Aug. 22	Friday	Undergraduate halls open for first-year student move-in beginning at 9:00 a.m.
Aug. 22-24	Fri-Sun	Welcome Weekend for first year undergraduate students
Aug. 23-24	Sat-Sun	STAR Orientation for students returning from time away
Aug. 24	Sunday	Undergraduate halls open for upperclass student move-in beginning at 9:00 a.m.
Aug. 25	Monday	Classes begin
Aug. 26	Tuesday	Mass - formal opening of school year at Notre Dame
Sept. 1	Monday	Labor Day - classes are in session
Sept. 2	Tuesday	Last date for all class changes
Sept. 26	Friday	Last date to drop a class at Saint Mary’s College
Oct. 18-26	Sat - Sun	Mid-Term break
Oct. 20	Monday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Oct. 21	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary’s College
Oct. 31	Friday	Last day for course discontinuance at Notre Dame
Nov. 17-Dec. 3	Mon - Wed	Registration appointments for the Spring 2026 semester
Nov. 26-30	Wed - Sun	Thanksgiving Holiday
Nov. 29-Dec.11	Sat - Thur	Course Instructor Feedback administered
Dec. 10	Wednesday	Last class day
Dec. 11,13-14	Thur, Sat-Sun	Reading days (no examinations permitted)
Dec. 12,15-18	Fri, Mon-Thur	Final examinations (no review sessions permitted)
Dec. 21	Sunday	Undergraduate halls close at Noon
Dec. 22	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame
Dec. 23	Tuesday	All grades due in PRISM by Noon at Saint Mary’s College
Jan. 4	Sunday	January 2026 graduation date (no ceremony)

CLASS MEETINGS*

MWF	42
MW	29
TuTh	28

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

NUMBER OF CLASS DAYS*

	Mon	Tues	Wed	Thur	Fri	Total
August	1	1	1	1	1	5
September	5	5	4	4	4	22
October	3	3	4	4	4	18
November	4	4	3	3	3	17
December	2	2	2	1	1	8
Total	15	15	14	13	13	70

SPRING 2026 SEMESTER

Jan. 11	Sunday	Undergraduate halls open for move-in beginning at 9:00 a.m. Spring Welcome for new undergraduate students
Jan. 12	Monday	Classes begin for Notre Dame and Saint Mary's College
Jan. 19	Monday	Martin Luther King Day – no classes/offices are closed
Jan. 20	Tuesday	Last date for all class changes
Feb. 13	Friday	Last date to drop a class at Saint Mary's College
Feb. 20-22	Fri - Sun	Junior Parents Weekend at Notre Dame - *tentative*
Mar. 7-15	Sat - Sun	Mid-Term break
Mar. 9	Monday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Mar. 10	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary's College
Mar. 18	Wednesday	Registration begins for the 2026 Summer Session at Notre Dame
Mar. 20	Friday	Last day for course discontinuance at Notre Dame
Apr. 3-6	Fri - Mon	Easter Holiday
Apr. 13-24	Mon - Fri	Registration appointments for the Fall 2026 semester
Apr. 15	Wednesday	Priority date for 2026/2027 financial aid applications at ND (for returning students)
Apr. 21-May 3	Tues - Sun	Course Instructor Feedback administered
Apr. 29	Wednesday	Last class day for Notre Dame
Apr. 30	Thursday	Last class day for Saint Mary's College
Apr. 30-May 3	Thur - Sun	Reading days for Notre Dame (no examinations permitted)
May 4-8	Mon - Fri	Final examinations (no review sessions permitted)
May 9	Saturday	Undergraduate halls close at Noon
May 11	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame
May 12	Tuesday	All grades are due in PRISM by Noon at Saint Mary's College
May 15-17	Fri - Sun	Commencement Weekend

CLASS MEETINGS*

MWF	41
MW	28
TuTh	29

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

NUMBER OF CLASS DAYS*

	Mon	Tues	Wed	Thur	Fri	Total
January	2	3	3	3	3	14
February	4	4	4	4	4	20
March	4	4	3	3	3	17
April	3	4	5	4	3	19
Total	13	15	15	14	13	70

2026 SUMMER SESSION (Regular 6-week)

First Class Day - June 8 Last Class Day – July 17 Graduation Date (No Ceremony) – August 2

NOTE: Summer Session classes will not be held on July 4 for most programs

UNIVERSITY OF NOTRE DAME AND SAINT MARY'S COLLEGE
JOINT ACADEMIC YEAR CALENDAR FOR 2026-2027
DRAFT

FALL 2026 SEMESTER

Aug. 17-18	Mon-Tues	Orientation and advising for new Graduate School students
Aug. 20	Thursday	International Student Orientation for new undergraduates
Aug. 20-23	Thur-Sun	Welcome Weekend for undergraduate transfer students
Aug. 21	Friday	Undergraduate halls open for first-year student move-in beginning at 9:00 a.m.
Aug. 21-23	Fri-Sun	Welcome Weekend for first year undergraduate students
Aug. 22-23	Sat-Sun	STAR Orientation for students returning from time away
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Aug. 25	Tuesday	Mass - formal opening of school year at Notre Dame
Aug. 31	Monday	Last date for all class changes
Sept. 7	Monday	Labor Day - classes are in session
Sept. 25	Friday	Last date to drop a class at Saint Mary’s College
Oct. 17-25	Sat - Sun	Mid-Term break
Oct. 19	Monday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Oct. 20	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary’s College
Oct. 30	Friday	Last day for course discontinuance at Notre Dame
Nov. 16-Dec. 2	Mon-Wed	Registration appointments for the Spring 2027 semester
Nov. 25-29	Wed-Sun	Thanksgiving Holiday
Nov. 28-Dec.10	Sat-Thur	Course Instructor Feedback administered
Dec. 9	Wednesday	Last class day
Dec. 10,12-13	Thur, Sat-Sun	Reading days (no examinations permitted)
Dec. 11,14-17	Fri, Mon-Thur	Final examinations (no review sessions permitted)
Dec. 20	Sunday	Undergraduate halls close at Noon
Dec. 21	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame
Dec. 22	Tuesday	All grades due in PRISM by Noon at Saint Mary’s College
Jan. 3	Sunday	January 2027 graduation date (no ceremony)

CLASS MEETINGS*

MWF	42
MW	29
TuTh	28

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

NUMBER OF CLASS DAYS*

	Mon	Tues	Wed	Thur	Fri	Total
August	2	1	1	1	1	6
September	4	5	5	4	4	22
October	3	3	3	4	4	17
November	5	4	3	3	3	18
December	1	2	2	1	1	7
Total	15	15	14	13	13	70

SPRING 2027 SEMESTER - DRAFT

Jan. 10	Sunday	Undergraduate halls open for move-in beginning at 9:00 a.m. Spring Welcome for new undergraduate students
Jan. 11	Monday	Classes begin for Notre Dame and Saint Mary's College
Jan. 18	Monday	Martin Luther King Day – no classes/offices are closed
Jan. 19	Tuesday	Last date for all class changes
Feb. 12	Friday	Last date to drop a class at Saint Mary's College
Feb. 19-21	Fri - Sun	Junior Parents Weekend at Notre Dame - *tentative*
Mar. 6-14	Sat - Sun	Mid-Term break
Mar. 8	Monday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Mar. 9	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary's College
Mar. 17	Wednesday	Registration begins for the 2027 Summer Session at Notre Dame
Mar. 19	Friday	Last day for course discontinuance at Notre Dame
Mar. 26-29	Fri - Mon	Easter Holiday
Apr. 12-23	Mon - Fri	Registration appointments for the Fall 2027 semester
Apr. 14	Wednesday	Priority date for 2027/2028 financial aid applications at ND (for returning students)
Apr. 20-May 2	Tues - Sun	Course Instructor Feedback administered
Apr. 28	Wednesday	Last class day for Notre Dame
Apr. 29	Thursday	Last class day for Saint Mary's College
Apr. 29-May 2	Thur - Sun	Reading days for Notre Dame (no examinations permitted)
May 3-7	Mon - Fri	Final examinations (no review sessions permitted)
May 8	Saturday	Undergraduate halls close at Noon
May 10	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame
May 11	Tuesday	All grades are due in PRISM by Noon at Saint Mary's College
May 14-16	Fri - Sun	Commencement Weekend

CLASS MEETINGS*

MWF	41
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*The number of class meetings and class days differ for Saint Mary's College

NUMBER OF CLASS DAYS*

	Mon	Tues	Wed	Thur	Fri	Total
January	2	3	3	3	3	14
February	4	4	4	4	4	20
March	3	4	4	3	2	16
April	4	4	4	4	4	20
Total	13	15	15	14	13	70

2027 SUMMER SESSION (Regular 6-week)

First Class Day - June 7 Last Class Day – July 16 Graduation Date (No Ceremony) – August 1

NOTE: Summer Session classes will not be held on July 4 for most programs

Mission Statement of the University of Notre Dame

CONTEXT

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

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

MISSION STATEMENT

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

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

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

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

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

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

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

The University of Notre Dame

Notre Dame is at once a Catholic university, a national symbol, and an international community of religious faith, intellectual inquiry, and devotion to the powerless. Among its conspicuous features are its academic reputation, an elaborately designed and golden-domed administration building, a famous collegiate football team, a popular shrine to the Mother of God, two fascinating lakes, a pleasantly landscaped campus, and a spirited student body surrounded by an intensely loyal community of alumni and friends who unabashedly refer to themselves as the Notre Dame "family."

The institution was founded on the site of an old Catholic missionary outpost in 1842. The founders were a small and impoverished band of French and Irish religious brothers whose leader was Rev. Edward F. Sorin, C.S.C., an impetuous, strong-willed, and apparently tireless priest. In a memoir titled *My Notre Dame,* Thomas Stritch, professor emeritus of American Studies and Notre Dame historian, wrote that Father Sorin "carved Notre Dame out of the Northern Indiana wilderness and by sheer strength of character made it go. He built and rebuilt, recruited students where he could, and gradually began the unique image Notre Dame still enjoys. In a college or university, reputation is everything. Somehow Sorin developed a favorable one for Notre Dame, one that reverberated throughout the American Catholic world, the Eastern Seaboard as well as the Midwest. Long before football was invented, Notre Dame caught the imagination of American Catholics."

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

In 1972, five years after the change in governance, a new chapter of University history began to be written as the first undergraduate women were admitted to Notre Dame. A quarter of a century later, the majority of living Notre Dame alumni have been graduated from a fully coeducational institution.

Obviously, many other aspects of the University have been changed by more than a century and a half of turbulent and unpredictable happenings in the Catholic Church and in American life and culture. Fires, outbreaks of infectious diseases, the Civil War, waves of European immigrants and refugees, Church controversies, the Great Depression, two world wars and several smaller bloodlettings, the civil rights movement, and other social convulsions in America, all have involved members of the Notre Dame family and have left deep and indelible imprints on the character and rich tradition of the institution. Rev. William Corby, C.S.C., a successor to Father Sorin, played a memorable national role as a Union chaplain at the Battle of Gettysburg; Rev. Julius Nieuwland, C.S.C., a scientist and faculty member, invented synthetic rubber; Notre Dame students were participants in a nationally publicized scuffle with a resurgent Ku Klux Klan; the University's

colorful football team and something of its campus atmosphere were enshrined in American history and myth by a film featuring a memorable performance by an actor who later became a president. More recently, a second film dramatized the University's spirit and gave a new name to unheralded athletes—*Rudy.*

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

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

Notre Dame's Vision for Undergraduate Education

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

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

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

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

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

Student Life

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

The Division of Student Affairs exists to enrich the experience of all Notre Dame students by offering services, resources, and engagement opportunities designed to develop students to their full potential as individuals, community members, and future leaders in the Church, society, and world.

Comprised of six areas, the Division coordinates University programs and resources that promote community, faith, wellness, belonging, service, engagement, and discernment on behalf of the University's student body.

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

Each of Notre Dame's 33 undergraduate residential communities has an atmosphere and character of its own. Unique traditions in each hall generate a feeling of loyalty and camaraderie among its residents. Well-trained rectors, assistant rectors, and senior resident assistants provide multiple layers of pastoral care for the students who call a Notre Dame residence hall "home."

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

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

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

Campus Ministry encourages participation in the sacramental and liturgical life of the Church; offers opportunities for small group discussions, pilgrimages, retreats, and service; aids in personal and vocational discernment; supports worship and personal prayer; and provides pastoral care.

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

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

Diversity and Engagement: The area of Diversity and Engagement aims to nurture belonging and inclusion among all students while further engaging underrepresented voices throughout the Notre Dame community.

Comprised of the Center for Diversity, Equity, and Inclusion, Multicultural Student Programs and Services, the Gender Relations Center, and the Office of Student Enrichment, the area exists to serve a diverse student population at Notre Dame by providing mentoring opportunities, peer engagement, and resources in support of the University's Catholic, Holy Cross mission.

Student Development: The area of Student Development supports the growth and formation of Notre Dame students through a wide range of programs, services, facilities, and activities that encourage healthy behaviors and the cultivation of community.

Departments that make up this area are the Family Resource Center, University Bands, the Office of Community Standards, RecSports, the Student Activities Office, and Student Media.

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

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

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

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

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

The Campus Life Council was created by the University's Board of Trustees to allow for discussion among students, faculty, and administrators concerning life on campus. The council is empowered to pass resolutions recommending student life policy changes to the administration.

The programming arm of the Student Senate at Notre Dame is the Student Union Board. This board coordinates such events as lectures, plays, concerts, movies, and more.

Student Conduct. A Catholic university is a society composed of students, faculty, and staff whose primary purpose is the pursuit of Christian wisdom. The society can exist only in an atmosphere of responsibility and good order. The University seeks, therefore, to provide those conditions and opportunities best suited for educating students.

Students registering at the University of Notre Dame agree to abide by the regulations concerning student conduct set forth in *du Lac, A Guide to Student Life*. *du Lac* is available online at dulac.nd.edu.

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

Intercollegiate Athletics

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

The University is committed to a well-rounded program for both men and women. The Notre Dame athletic tradition boasts national contenders across 26 varsity sports (13 men's sports and 13 women's sports) and since 2001, the Irish have won national championships in fencing ('05, '11, '17, '18, '21 '22 and '23), women's basketball ('01 and '18), women's soccer ('04 and '10), men's lacrosse ('23) and men's soccer ('13).

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

FACILITIES

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

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

On top of all that, the Joyce contains the administrative and business offices and houses a vast majority of Notre Dame athletics employees. Lastly, on the second floor of the Joyce Center is Heritage Hall, a special display of all former Monogram winners and key moments in the varsity programs' various histories.

Purcell Pavilion opened in October 2009 after a massive $26.3 million addition and renovation to the Joyce Center. The finished product, which maintains the intimate environment that has provided a home-court advantage for Notre Dame since the facility first debuted in 1968, added chair-back seating throughout the venue. It also added a three-story updated structure to the south end that now houses Notre Dame ticket operations, the Mike Leep Sr. Varsity Shop and Club Naimoli, a spacious (16,500 square feet) and comfortable hospitality area that can be used during basketball games and for University private functions.

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

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

The University of Notre Dame is enjoying its 19th full season with access to the Guglielmino Athletics Complex, affectionately referred to as "The Gug" (pronounced Goog). The Gug houses the football practice-week locker rooms, coaches' offices and meeting rooms in addition to enhanced sports medicine, strength and conditioning and weight room equipment for all Notre Dame student-athletes.

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

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

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

Loftus Sports Center is now in its 37th full year of service at the University of Notre Dame and is one of the most widely used athletics buildings on campus. Designed for use by all Notre Dame athletics teams as well as students, faculty and staff, the center comprises nearly 129,000 square feet and stands tucked in a forested area of campus just north of LaBar Practice Complex and connected to the Guglielmino Athletics Complex. Dedicated on April 23, 1988, the Loftus Center saw its first football practice on Sept. 30 of that season. The facility is a gift of John R. Loftus, a member of Notre Dame's basketball team in 1944, 1948 and 1949. The Irish track and field program hosts a number of indoor meets in the complex each season, including the well-known Meyo Invitational. The men's and women's lacrosse, softball and baseball teams practice on Meyo Field (a gift of Raymond D. Meyo), a 100-yard Prestige Turf field, throughout the winter and spring seasons.

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

Labar Practice Complex enters its 16th season of use and is home to the outdoor practice fields of the Fighting Irish football team. A gift of Rees and Carol LaBar, the practice fields are located directly south of the Guglielmino Athletics Complex (on the former site of Moose Krause Stadium and Cartier Field). The LaBar Practice Complex features three football fields, lights, video towers, a maintenance building to provide storage, and is secured with an eight-foot fence. All three practice fields are FieldTurf fields (installed for 2019), allowing the Irish to practice year-round without fear of damaging grass fields due to inclement weather and general wear and tear. The third field is a natural grass field.

Construction of Compton Family Ice Arena, a state-of-the-art, two-sheet ice facility, began in March 2010 south of the Joyce Center. The rink (200'x90') in the main arena (capacity ~5,000) is named in honor of legendary Irish coach Charles W. "Lefty" Smith Jr., while an Olympic-sized (200'x100') auxiliary rink sits on the basement level. The facility includes offices, locker rooms, strength, cardio and other training areas for the Notre Dame hockey program as well as locker rooms, service and support staff and areas necessary to operate campus and community hockey, skating and other recreational ice sport usage. For Irish games and other hospitality functions, O'Brien's, a club area with adjacent premium seating is available on the mezzanine level. The facility opened on October 18, 2011, and Notre Dame played its first hockey game in the new building on October 21 against RPI.

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

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

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

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

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

The construction of the new Harris Family Track and Field Stadium was completed in 2018, featuring an existing nine-lane track where the Irish hold outdoor meets during the spring competition season. Harris Family Stadium is located southeast of the Joyce Center and features space for throwing and jumping events in two directions and a warm-up area at one end of the track. Among the amenities are men's and women's locker rooms, a training facility and a team room, in addition to press box and concession facilities. The first meet held in the venue was the Bob Harris Open, which was held on May 1, 2021.

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

Campus Security and Fire Safety

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

The Spirit of Inclusion at Notre Dame

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

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

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

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

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

Academic Profile

DEGREES AND ACADEMIC PROGRAMS

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

In the 2022–23 academic year, there were a total of 9,038 enrolled undergraduate students. The students enrolled in the College of Arts and Letters topped the enrollment figures with approximately 2,606. There were 2,450 students in the Mendoza College of Business, 1,895 students in the College of Science, 2,011 students in the College of Engineering, 239 students in the School of Architecture, and 127 students in the Keough School of Global Affairs.

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

Africana Studies
American Studies
Anthropology
Art, Art History, and Design
- Art History
- Art Studio
- Design

Classics
- Arabic
- Classics
  - Greek
  - Latin
- Greek and Roman Civilization

Computer Science
East Asian Languages & Cultures
- Chinese
- Japanese

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

English
Film, Television, and Theatre
Gender Studies
German and Russian Languages and Literatures
- German
- Russian

History
Mathematics (honors only)
Medieval Studies
Music
Neuroscience and Behavior
Philosophy
Philosophy and Theology
Political Science
Program of Liberal Studies
Psychology
Romance Languages and Literatures
- French and Francophone Studies
- Italian
- Romance Languages and Literatures
- Spanish

Sociology
Theology

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

Accountancy
Business Analytics
Business Technology
Finance
Strategic Management
Marketing

The College of Engineering offers curricula leading to degrees of:

B.S. in Aerospace Engineering
B.S. in Chemical Engineering
B.S. in Civil Engineering
B.S. in Computer Engineering
B.S. in Computer Science
B.S. in Electrical Engineering
B.S. in Environmental Earth Sciences
B.S. in Environmental Engineering
B.S. in Mechanical Engineering

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

Applied and Computational Mathematics and Statistics
Biochemistry
Biological Sciences

Chemistry
Chemistry/Computing
Environmental Sciences
Mathematics
Neuroscience and Behavior
Physics
Physics in Medicine
Preprofessional Studies
Science–Computing
Science–Education
Statistics

The Keough School of Global Affairs offers the degree of bachelor of arts in global affairs.

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

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

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

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

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

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

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

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

Advising. All first-year students are assigned an academic advisor in their college. The **Center for University Advising** office is located in 319 Bond Hall, and advising offices for each college/school can be found across campus: the **School of Architecture** in 114 Walsh Family Hall of Architecture; the **College of Arts and Letters** in 104 O'Shaughnessy Hall; the **Mendoza College of Business** in 101 Mendoza; the **College of Engineering** in 257 Fitzpatrick Hall; the **Keough School of Global Affairs** in 1010 Jenkins Nanovic Halls; and the **College of Science** in 215 Jordan Hall. After a major has been declared, students are assigned a departmental advisor as well.

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

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

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

University Requirements

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

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

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

Four courses exploring explicitly Catholic dimensions of the liberal arts:
*1. A foundational Theology course
*2. A developmental Theology course
*3. An introductory Philosophy course
*4. An additional Philosophy course or a Catholicism and the Disciplines course

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

The two-semester Moreau Program

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

(a) Only courses identified as approved "Ways of Knowing" for the University Core Curriculum can be used to fulfill a University requirement. Approved courses are administratively marked with a "WKxx" identifier in Class Search each semester to denote their approved status as a "Way of Knowing." These courses can be viewed for a particular academic term by selecting the "Class Search" link within insideND or by visiting the home page of the Office of the Registrar website and clicking on the "Class Search" link.

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

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

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

(e) A minimum cumulative average of 2.000.

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

(g) Enrollment in the last semester on the main University campus. Under extraordinary circumstances this requirement can be waived by the dean (or the dean's designee) of the student's college. Students also take a second required one-credit course at the end of their undergraduate studies as part of the Moreau Program. More can be found at moreaufirstyear.nd.edu.

The following principles guide the application of these requirements.

1. All courses approved for the University Core must be at least 2.5 credit hours. In rare circumstances, a maximum of two so-called "mini-courses" (less than 2.5 credit hours) may be reviewed by a Core subcommittee and approved (as a combined set) but only if they form a coordinated and coherent whole.
2. Courses counting toward the University Core must be letter-graded and may not be graded as Satisfactory/Unsatisfactory or Pass/Fail.
3. Transfer students (a) are not required to complete the Core's University Seminar requirement and (b) may choose to take another approved Writing Intensive course in lieu of the Writing and Rhetoric requirement. Other University Core requirements are not waived for transfer students.
4. At the discretion of the student's dean or dean's designee, transfer credits may be accepted for University Core requirements. The student's dean or dean's designee typically seeks an appropriate correspondence between transfer courses and approved courses in Notre Dame's Course Catalog. When no such correspondence exists, transfer courses (and study abroad courses) are vetted by Notre Dame's academic departments and the Core curriculum subcommittees.

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

Central to undergraduate education at Notre Dame is the Core curriculum, a set of University required courses intended to provide every undergraduate with a common foundation in learning. Detailed rationales for each requirement can be found at http://corecurriculum.nd.edu/.

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

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

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

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

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

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

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

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

Fine Arts and Literature. Students approach works of art and literature from critical perspectives—as viewers, readers, or listeners—and they apply the analytical tools needed to realize the insights and pleasures that artistic texts and works offer. Students may engage in the creative process, and in so doing gain insights as to how artists interact with their media and how creativity meshes with understanding. The critical analysis of others' creative practice will enable students to develop the analytical tools to recognize a work's formal dimensions and its ideas as well as the often-complex interaction between the two. Engagement with artworks will also lead students to reflect on how aesthetic forms of expression

help us define ourselves and our world. Analysis of a work of art, be it through its production, through careful interpretation of the work, or through its reception, will lead students to a deeper reflection on how art and society interact, and how artistic expression reflects the position of the artist and the individual with respect to society at large.

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

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

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

Moreau Program. The Moreau First-Year Seminar is a reflection of the distinct manner in which Notre Dame seeks to integrate academic rigor with personal growth, bringing together students, faculty, and staff from across all departments in a shared endeavor to study and practice living well. You will

Grading System

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

Letter Grade	*Point Value*	*Description*	*Explanatory Comments*
A	4.000	Truly Exceptional	Work meets or exceeds the highest expectations for the course
A-	3.667	Outstanding	Superior work in all areas of the course
B+	3.333	Very Good	Superior work in most areas of the course
B	3.000	Good	Solid work across the board
B-	2.667	More than Acceptable	More than acceptable, but falls short of solid work
C+	2.333	Acceptable: Meets All Basic Standards	Work meets all the basic requirements and standards for the course
C	2.000	Acceptable: Meets Most Basic Standards	Work meets most of the basic requirements and standards in several areas
C-	1.667	Acceptable: Meets Some Basic Standards	While acceptable, work falls short of meeting basic standards in several areas
D	1.000	Minimally Passing Work	Work just over the threshold of acceptability
F	0.000	Failing	Unacceptable performance
X	0.000		Given with the approval of the student's dean (or the dean's designee) in extenuating circumstances beyond the control of the student. After consultation with the student's dean (or the dean's designee), the Registrar converts an X grade to an "F" if the grade is not otherwise resolved within 30 days after the beginning of the next semester.

The following grades may be assigned by the Registrar. They may not be given by a member of the faculty.

W	Discontinued with permission.	Discontinued with permission of the student's dean (or the dean's designee) following the last day for course discontinuance, per the Undergraduate Academic Code.
NR	Not Reported	Final grade(s) not reported by the instructor because of extenuating circumstances. No final grade reported for the course. It will revert to an "F" if not resolved by the beginning of final week in the next semester for which the student is enrolled.
F*	Not Reported	No final grade reported for an individual student. Assigned when the instructor has failed to report a grade for either an individual student or an entire class. It reverts to "F" if not changed within 30 days after the beginning of the next semester in which the student is enrolled.

The following letter grades may be given, but are not included in the computation of a student's Grade Point Average.

P	Pass (Pass/Fail Option: Junior or senior undergraduates may file with their academic dean [or the dean's designee], during the first six class days of the semester, the decision to take on a pass/fail basis one course per semester. Policy details are outlined in the Undergraduate Academic Code.)
S	Satisfactory work (courses with zero credit hours, as well as research courses, departmental seminars, colloquia or directed studies; workshops; field education and skill courses).
U	Unsatisfactory work (courses with zero credit hours, as well as research courses, departmental seminars, colloquia or directed studies; workshops; field education and skill courses).

conclude your Moreau experience in your final year when you reflect on your efforts to live well and anticipate how to flourish after graduation.

Graduation Rate

Of the students entering a full-time, first-year bachelor degree-seeking program in the fall of 2018, 95 percent graduate within six years. The complete IPEDS Graduation Rate Survey may be found in the Office of Institutional Research, Innovation, & Strategy (http://iris.nd.edu).

Honors at Graduation. In the undergraduate colleges, a degree will be granted with highest honors (summa cum laude) if the student's grade point average ranks among the top 5.000 percent of those students graduating from the student's college or school; for a student whose grade point average ranks among the top 15.000 percent of the student's college or school, a degree will be granted with high honors (magna cum laude); for a student whose grade-point average ranks among the top 30.000 percent of the student's college or school, a degree will be granted with honors (cum laude). A student who meets the requirements of more than one category of honors will be awarded only the highest honor for which that student qualifies.

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

Academic Code of Honor

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

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

Before matriculation, each entering student must pledge:

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

The Undergraduate Academic Code

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

Using Notre Dame Email

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

Notre Dame NetID Student Policy

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

Hesburgh Libraries

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

We often hear students say, "If only I had known sooner how much help I could get from the Libraries…my job as a student would have been much easier!" Subject Librarians offer research assistance in all academic disciplines and are available face-to-face, by email, phone and chat. Check out our website at library.nd.edu for a list of subject specialists, resource guides and special programs to help focus your efforts and develop your research skills.

During a typical academic year, the Hesburgh Library is open nearly every day, with 24-hour access 5 days per week. For more information about the services, spaces and collections at the Hesburgh Libraries visit library.nd.edu.

Main Library. The iconic Theodore M. Hesburgh Library opened in 1963 as "Memorial Library" and was one of the largest collegiate libraries of its day. Home to many core services and resources as well as reference and subject librarians, the Hesburgh Library continues to serve as the flagship building of the Hesburgh Libraries system here at Notre Dame. In addition to the general research collections on open stacks, three specialty Libraries and Centers reside within the Hesburgh Library building:

Hesburgh Library
(574) 631-6679
library.nd.edu

Medieval Institute Library
7th Floor, Hesburgh Library
(574) 631-5724
library.nd.edu/medieval

Navari Family Center for Digital Scholarship
2nd Floor NE, Hesburgh Library
(574) 631-4900
cds.library.nd.edu

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

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

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

Architecture Library
150 Walsh Family Hall of Architecture
(574) 631-6654
library.nd.edu/architecture

Mahaffey Business Library
L001 Mendoza College of Business
(574) 631-9098
library.nd.edu/business

Music Library
310 O'Neill Hall
(574) 631-8686
library.nd.edu/music

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

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

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

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

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

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

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

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

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

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

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

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

Academic Resources

Faculty. In 2024–25, Notre Dame's instructional faculty numbered 1,329 full-time and 205 part-time. Other faculty, such as administrative, professional specialists, librarians, and research fellows, numbered 337 full-time and 3 part-time. Ninety-one percent of the full-time instructional faculty have terminal degrees; 93 percent of them have doctorates. Ninety-eight percent of the full-time instructional faculty are lay persons. (The faculty to student ratio is 1:8)

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

The University Institutes at Notre Dame include the Ansari Institute for Global Engagement with Religion, Institute for Social Concerns, Eck Institute for Global Health, Fitzgerald Institute for Real Estate, Institute for Educational Initiatives, Kellogg Institute for International Studies, Keough-Naughton Institute for Irish Studies, Kroc Institute for International Peace Studies, Lucy Family Institute for Data & Society, McGrath Institute for Church Life, Medieval Institute, Nanovic Institute for European Studies, and Tantur Ecumenical Institute.

The University Centers at Notre Dame include the Berthiaume Institute for Precision Health, Center for Research Computing, Environmental Change Initiative, Global Center for the Development of the Whole Child, Institute for Advanced Study, Klau Center for Civil and Human Rights, ND Energy, NDnano—Center for Nanoscience and Technology, and Technology Ethics Center (ND-TEC).

The College Institutes at Notre Dame include the Environmental Research Center (UNDERC), Harper Cancer Research Institute, Institute for Flow Physics and Control, Institute for Latino Studies, Liu Institute for Asia and Asian Studies, Notre Dame Institute for Global Investing, Pulte Institute for Global Development, and Wireless Institute.

The College Centers at Notre Dame include the Boler-Parseghian Center for Rare and Neglected Diseases, Center for Accounting Research and Education (CARE), Center for Astrophysics (CANDU), Center for Citizenship & Constitutional Government, Center for Civic Innovation, Center for Ethics and Religious Values in Business, Center for Italian Studies, Center for Mathematics, Center for Philosophy of Religion, Center for Research on Educational Opportunity, Center for Stem Cells and Regenerative Medicine, Center for STEM Education, Center for the Study of Religion and Society, Center for the Study of Social Movements, Cushwa Center for the Study of American Catholicism, de Nicola Center for Ethics and Culture, Eugene D. Fanning Center for Business Communication, John J. Reilly Center for Science, Technology and Values, Notre Dame Deloitte Center for Ethical Leadership, Notre Dame International Security Center, Rooney Center for the Study of American Democracy, Ruth M. Hillebrand Center for Compassionate Care in Medicine, Warren Family Research Center for Drug Discovery & Development, William J. Shaw Center for Children and Families, Wilson Sheehan Lab for Economic Opportunities, and W.M. Keck Center for Transgene Research.

The Competitively Awarded Centers at Notre Dame include the Actinide Center of Excellence, Applications and Systems-Driven Center for Energy-Efficient Integrated Nanotechnologies (ASCENT), Center for Shock Wave-Processing of Advanced Reactive Materials (C-SWARM), Institute for Structure and Nuclear Astrophysics (ISNAP), Joint Institute for Nuclear Astrophysics—Center for the Evolution of the Elements (JINA-CEE), NSF Center for Computer-Assisted Synthesis, Pratt & Whitney Center of Excellence (Turbomachinery Laboratory), QuarkNet, Radiation Laboratory, and Robinson Community Learning Center.

Other academic support units include the Analytical Science and Engineering Core Facility, Center for Environmental Science and Technology, Center for the Study of Languages and Cultures, Center for Social Science Research, Center for University Advising, Chemical Synthesis and Drug Discovery Core Facility, Creative Computing Group, Engineering and Design Core Facility, Flatley Center for Undergraduate Scholarly Engagement, Genomics and Bioinformatics Core Facility, Institute for Scholarship in the Liberal Arts, Integrated Imagining Facility, Kaneb Center for Teaching Excellence, Magnetic Resonance Research Center, Mass Spectrometry and Proteomics Facility, Materials Characterization Facility, Nanofabrication Facility, Navari Family Center for Digital Scholarship, Notre Dame Learning, and The Writing Center.

Notre Dame Research. At the University of Notre Dame, research awards of more than $223 million have paved the way for new discoveries, unlocked knowledge, and improved technologies. Notre Dame Research is committed to supporting a culture of research, scholarship, and creative endeavor throughout campus, in order to help the University be a repository for knowledge and a powerful means for doing good in the world.

NDR provides support to these researchers in various aspects of research activity, including administration, compliance, technology transfer, innovation, and more. In addition, NDR supports and encourages innovation in more than 30 world-class core facilities and resources, as well as in a number of key areas of research, including cancer, environmental change, global health, and many more.

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

More information regarding Notre Dame Research can be found at research.nd.edu or by following https://www.linkedin.com/company/undresearch on LinkedIn.

Raclin Murphy Museum of Art. Classic but contemporary, the Robert A.M. Stern-designed facility features more than twenty galleries and numerous site-specific commissions by internationally renowned artists such as Jenny Holzer, Maya Lin, Mimmo Paladino, Jaume Plensa, and Kiki Smith. In addition to presenting the storied permanent collection and dynamic temporary exhibitions, the Museum features a chapel—*Mary, Queen of Families,* a sacred space for contemplation and masses—that offers a unique curatorial opportunity to consider important works from the collection.

With origins dating to 1875, the Raclin Murphy Museum of Art (formerly Snite Museum of Art) is one of the oldest and most highly regarded university art museums in America. Founded on the principle that art is essential to understanding individual, shared, and diverse human experiences and beliefs, the Museum encourages close looking and critical thinking. Experiences with significant, original works of art are intended to stimulate inquiry, dialogue, and wonder for audiences across the academy, the community and around the world—all in support of the University of Notre Dame's Catholic mission. The renowned permanent collection contains more than 30,000 works representing many cultures and periods of world art history.

The galleries integrate painting, sculpture, decorative arts, works on paper, and textiles. A multi-story Sculpture Court is an integral feature of the building, with natural light that creates a luminous and spacious area for displaying sculpture. The Teaching Gallery, Learning Commons, and Object Study Room celebrate the vital educational mission of the Museum, and, nestled in the central atrium, the cafe and bookshop provide a complete visitor experience.

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

The Raclin Murphy Museum is part of the nine-acre Charles B. Hayes Family Sculpture Park. Sculpture has long played a significant role in the cultural life of the University of Notre Dame, and the Park has become an open-air gallery fully engaging with the natural environment. The Park features work by acclaimed international sculptors.

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

Admission

The Office of Undergraduate Admissions saw around 35,000 applications for admission to Notre Dame's first-year class this past year. Most applicants will have the academic aptitude and preparation necessary to complete a degree program at the University. The Committee on Admissions decides which applicants will be among the 2,080 included in the class. To understand how this is done, it is first necessary to know the procedure for applying to Notre Dame.

ACADEMIC PREPARATION

The University requires the completion of the following high school courses in order to be considered for admission. A unit is equivalent to the credit for a year of satisfactory work in an accredited secondary school. The two language units must be in the same language and a language offered by the University of Notre Dame.

Students are required to take 16 units during their high school career. This distribution will differ slightly based on the student's intended area of study, but must include the following:

- 4 units of English
- 3 units of Mathematics—Algebra I, Algebra II, and Geometry *(4 units preferred)**
- 2 units of Foreign Language *(3–4 units preferred)*
- 2 units of Science *(4 units preferred)***
- 2 units of History/Social Science *(3–4 units preferred)*

*For students with an intended major within the College of Science, the College of Engineering, the School of Architecture, or certain majors within the College of Arts & Letters (Neuroscience and Behavior, Pre-Health, Computer Science), 4 units of Mathematics are required, which must include an advanced Mathematics course (Pre-Calculus or Calculus).

**Students with an intended major within the College of Science or the College of Engineering must take a unit of Chemistry. Additionally, the following majors require a unit of Physics:

- Applied and Computational Mathematics and Statistics
- Chemistry
- Biochemistry
- Chemistry with Business
- Mathematics (B.A. or B.S.)
- Physics
- Physics-in-Medicine
- All Engineering majors (except for Computer Science)

It is also strongly recommended that students with the following intended majors take a unit of Physics:

- Architecture
- Biological Sciences
- Computer Science (B.A. and B.S.)
- Environmental Sciences
- Neuroscience and Behavior (B.A. and B.S.)
- Science Preprofessional Studies
- Arts and Letters Pre-Health
- Science – Computing
- Science – Education
- Statistics

Although a minimum of 16 academic units are required for admission, the most competitive applicants will have four units in each major academic area and in the most rigorous level their high school offers. We do include algebra and/or foreign language courses completed during eighth grade in our count of admissions requirements.

APPLICATION PROCESS

First-year students are admitted to the University of Notre Dame for the fall semester of each academic year. A student who wishes to be considered must have the following items on file: (1) a completed application with accompanying writing supplement, (2) an official high school transcript, (3) one letter of evaluation from a teacher of a core subject area. While SAT or ACT have historically been required, the University has been test-optional for the past five years, and will continue to be so for the 2025–26 application cycle. This policy allows applicants to choose whether or not they wish to submit their test scores as part of their application.

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

The University of Notre Dame offers three secure online application options for first-year applicants, and prospective applicants may register for an account to access the online application and writing supplement beginning August 1.

- Common Application at commonapp.org
- Apply Coalition on Scoir at https://app.scoir.com/app/signup/2800092
- Questbridge Application at questbridge.org

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

Testing. Notre Dame is test-optional for the 2025–26 application cycle, meaning applicants have the choice of whether they wish to submit SAT or ACT scores for consideration as part of the evaluation process for admission. Those wishing to include test results, should take the standardized tests no later than January of their senior year.

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

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

DECISION AND NOTIFICATION PLANS

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

Restrictive Early Action: November 1

Notre Dame has a Restrictive Early Action program.

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

Students who apply in the Restrictive Early Action process receive an admissions decision in mid-December. Three decisions are possible:

- Admission to the University
- Not selected for admission to the University
- Deferral of decision until Regular Decision

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

Because the Admissions Committee is unable to extend all of its offers of admission in the Restrictive Early Action process, it is highly conservative when making these admission decisions. The Admissions Committee advises students to apply in the Restrictive Early Action process if Notre Dame is one of their top choices and they are able to submit their strongest application by November 1. Further clarification of Restrictive Early Action standards for this year can be gained by contacting the Office of Undergraduate Admissions at admissions@nd.edu or visiting admissions.nd.edu.

Regular Decision: January 2
The Regular Decision process at Notre Dame is also non-binding. Three decisions are possible following the Regular Decision process:

- Admission to the University
- Not selected for admission to the University
- Waitlist

Students will receive one of these decisions by late March and, if admitted, are required to submit their enrollment confirmation and deposit by May 1. Students who are not selected for admission to the University may choose to attend another four-year institution for one or two years and then apply to Notre Dame as a transfer student.

Waiting List. Some applicants will be notified that they have been placed on a waiting list and will receive a final decision by mid-June. Applicants who are placed on the waiting list should make plans to attend another institution as the number of applicants who will gain admission from the waiting list in a given year is unpredictable. Students admitted from the waiting list typically have around one week to submit a $500 advance payment, confirming their intention to enroll in the first-year class.

THE SELECTION PROCESS

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

Academic Preparedness. In evaluating a student's academic achievement, the Committee on Admissions considers a student's curriculum, classroom performance, concentration of talent in the high school, test scores and/or other quantitative evidence (if submitted), teacher recommendation, and essays. Most students admitted to Notre Dame have taken the most demanding courses available and have demonstrated a high degree of academic preparation.

Personal Qualities. Each student's application is studied to determine what talents, skills, and interests that person might offer Notre Dame's community. We have a strong interest in people who can make unique contributions, as there is need in each first-year class for a variety of talents and personalities. The listing of activities, written statements, and evaluations give the Committee on Admissions a view of the person represented by the application. Therefore, it is important to present talents as well as personal and intellectual interests on the application.

MENDOZA COLLEGE OF BUSINESS

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

STUDENTS WITH DISABILITIES

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

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

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

For more information, contact Sara Bea Accessibility Services at 574-631-7833 or sarabeacenter@nd.edu.

INTERNATIONAL STUDENTS

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

The admissions process for international students who are not Permanent Residents of the United States differs from the process for U.S. citizens.

Additionally, as English proficiency is critical to a student's academic success at the University, students who do not speak fluent English must take the Test of English as a Foreign Language (TOEFL), IELTS, DET, or PTE Academic. We will wave the English proficiency exam if:

- An applicant scores 650 or above on the Evidence-Based Reading and Writing section of the SAT, and/or
- An applicant scores 26 or above on the English or Reading Sections of the ACT.

Please refer to admissions.nd.edu for up-to-date information related to our international admissions process.

TRANSFER ADMISSION

Some students are admitted to Notre Dame with advanced standing. Students wishing to apply for admission as a transfer student must have obtained the equivalent of at least 24 semester hours of transferable credit, and maintained a cumulative "B" average in all courses. (The competition is such that the average GPA for admitted students is significantly higher.) The committee gives strong preference to applicants whose curriculum aligns with Notre Dame's Core Curriculum and have satisfied course prerequisites for particular majors, as outlined on the admissions website. Asynchronous online courses, distance-learning courses, USAFI courses, and credits earned through the College Level Examination Program (CLEP) are not transferable.

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

Transfer applicants must provide the Office of Admissions with (1) a completed application form, (2) an official transcript from each college attended along with course syllabi, (3) a final high school transcript, (4) optional: an official SAT or ACT score, (5) a mid-term grade report, and (6) a college student record form.

On-campus housing for transfer students cannot be guaranteed. Off-campus housing close to the University is available; and transfer students are offered campus accommodations from a waiting list if rooms become available.

The transfer application deadline for the fall semester is March 15. The Transfer Admissions Committee will notify of its decision between May 20 and June 14. The deadline for the spring semester is October 1. The committee will notify you of its decision between December 1 and January 5.

Students interested in applying for transfer will find the application at https://admissions.nd.edu/apply/resources-for-transfer-applicants/apply/.

In addition to the standard transfer process, Notre Dame also offers Engineering Dual-Degree Programs with specific partner institutions. Students in these programs spend three or four years at the partner institution, then apply to complete their engineering studies at Notre Dame in their fourth

and/or fifth year. Students earn two degrees at the end of five years—a bachelor of arts or bachelor of science degree from the partner institution and a bachelor of science in engineering degree from Notre Dame. Student requirements for eligibility in the program are determined by a Memorandum of Understanding between Notre Dame and individual partner institutions. Additional details of the program, including a current list of partner institutions, can be found on Notre Dame's Admission website at https://admissions.nd.edu/apply/resources-for/transfer-applicants/dual-degree-programs-with-partner-schools/.

Fees and Expenses

In the undergraduate colleges, the University is essentially a residence school for full-time students. The Office of Residential Life requires students to live on campus for six semesters. Permission to live off campus must be obtained from the Office of Residential Life. The fees listed below are for the academic year 2025–26 and are subject to change according to factors operating within the economy that affect universities as well as the country as a whole.

Campus Resident Student. The basic fee for the academic year 2025–26 is $43,022.50 per semester. This fee entitles the student to instruction and tuition for the semester; meals in the University dining halls; a room in a residence hall; the use of the general library and the departmental libraries; admission to many lectures, concerts, and entertainment in Washington Hall and DeBartolo Performing Arts Center; the use of the Rockne Memorial, the Joyce Center, the Smith Center for Recreational Sports, the athletic fields, and the University golf course (there is a nominal fee for the use of the golf course); a copy of each issue of the *Scholastic* (the news magazine of the University) and a copy of the *Dome* (the yearbook of the University) in the second semester.

Off-Campus Student. The tuition and fees for the full-time off-campus student is $33,803.50 per semester for the academic year 2025–26, which entitles the student to instruction for the semester and those things listed above under the total fee for the campus resident student. For the off-campus student requiring board and lodging at the University Health Services in time of illness, there is a daily charge.

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

Undergraduate Fees.

- Technology Fee: $125 per semester.
- Health Center Access Fee: $75 per semester.
- Student Activity Fee: $47.50 per semester.
- *Observer* Fee (student newspaper): $6 per semester.

The above fees do not cover the cost of textbooks, course packets, etc., which is estimated at $1,250 per year for the average undergraduate student.

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

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

Student Accident and Illness Insurance Plan. To assist in financing any medical or hospital bills, a student health insurance plan is available to students. Notre Dame requires all international students and students enrolled in their first year at Notre Dame to have health insurance coverage comparable to the University Plan; therefore, they are automatically enrolled in and charged for the student health insurance plan.

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

The cost of the premium for the 2025–26 academic year is detailed on the University Health Service website at uhs.nd.edu.

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

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

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

Monthly Payment Plan. The University makes available a monthly payment plan administered by Nelnet, the company that provides and supports **IRISH**PAY. This plan allows families to make payments over a 10-month period rather than make two larger payments, one at the beginning of each semester.

The annual fee to enroll in the program is $50. For additional information or to enroll in the plan, call Nelnet toll-free at 888-470-6014 or visit studentaccounts.nd.edu/payments.

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

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

Students receiving University and/or Federal Title IV financial assistance who separate from the University within the first sixty percent (60%) of the semester are not entitled to the use or benefit of University and/or Federal Title IV funds beyond their separation date. Such funds shall be returned promptly to the entity that issued them, on a pro rata basis, and the return of such funds to the issuing entity will be

reflected on the student's University account. When a student separates from the University after the first sixty percent (60%) of the semester, the student is entitled to the full benefit of the University and/or Federal Title IV funds awarded to him/her and no such funds are required to be returned to the issuing entity.

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

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

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

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

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

This Separation Regulation may change subject to federal regulations.

SARA Complaint Resolution Policies and Procedures. With regard to courses and programs delivered online to individuals outside the State of Indiana, the University is an approved institution by the National Council for State Authorization Reciprocity Agreements (SARA). As a result, the University has authorization to provide courses and programs online to individuals in all of the states that are participants in SARA. If you are a participant in an online course or program offered by the University in a SARA state, we encourage you to contact the relevant department at the University with any complaints you may have about such course or program. However, if you would like to pursue a complaint with a state agency about the course or program, you should contact the following Indiana state agency, regardless of the SARA state in which you reside or from which you are taking the online course or program: Indiana Commission for Higher Education; 101 W. Ohio Street, Suite 300; Indianapolis, IN 46204-4206; (ph) 317-232-1033. Visit https://www.in.gov/che/student-complaints/ for more information and to access the student complaint form.

Student Financial Aid

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

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

Cost of Attendance. The estimated average 2025–2026 Notre Dame undergraduate student expense budget includes:

Direct Costs	
Tuition and Fees	$67,607
Housing and Food*	18,438
Total	$86,045

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

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

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

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

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

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

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

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

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

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

International Students. Prospective students wishing to be considered for need-based financial aid must complete CSS Profile Application. The Profile is available at collegeboard.org and should be filed according to the priority dates on the Office of Financial Aid website. The Profile is required for University need-based scholarship consideration. Notre Dame's CSS code for the Profile is 1841.

FINANCIAL AID PROGRAMS

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

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

SCHOLARSHIPS/GRANTS

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

Merit Scholarships. Notre Dame offers a limited number of merit scholarships to students accepted for admission as a first-time incoming freshman. Recipients demonstrate exceptional accomplishment, leadership, commitment to service, and intellectual promise. These scholarships are renewable for four years.

Notre Dame Scholarships. All students accepted for admission, who have completed the financial aid process as outlined above, are automatically considered for University scholarships. The level of University assistance is first based on demonstrated financial need.

Renewal of University scholarship assistance is based upon a review of students' academic performance at the University and their annually demonstrated financial need. Based on the students' admitted class level, University scholarship consideration is given for a maximum of eight semesters (10 semesters for the Architecture program and the combination five-year engineering program with the College of Arts and Letters). Students electing to remain at Notre Dame to pursue a second major, second degree, or dual-degree program are not eligible for University scholarships.

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

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

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

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

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

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

State Scholarships and Grants. Indiana provides need-based grants to Indiana residents attending Notre Dame.

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

Veterans Educational Benefits. Veterans' benefits are approved by the Indiana State Approving Agency. Students who qualify to use educational benefits can find information on the certification process on the Office of the Registrar's website, https://registrar.nd.edu/enrollment-registration/veteran-affairs/.

Department of Veteran Affairs Pending Payment Policy: The University will not take any of the four following actions toward any student using the U.S. Department of Veteran Affairs (VA) Post-9/11 G.I.Bill® (Ch. 33) or Veteran Readiness and Education (Ch. 31) benefits, while their payment from the VA is pending:

- Prevent their enrollment;
- Access a late penalty fee;
- Require they secure alternative or additional funding;
- Deny their access to any resources available to other students who have satisfied their tuition and fee bills.

However, to qualify for this provision, students using Ch. 33 or Ch. 31 benefits are required to:

- Produce the VA's Certificate of Eligibility by the first day of class;
- Confirm their use of VA benefits via a Benefit Election eForm.

Attention: Students utilizing Department of Veteran Affairs Education Benefits—The current policy *does not permit* Notre Dame to certify educational benefits for our study abroad programs listed in this bulletin. Students can still participate in these programs, however, VA funds cannot be certified or applied for these courses. Any tuition and fees for these courses would be the responsibility of the student to fund through other means.

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

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

STUDENT EMPLOYMENT

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

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

LOANS

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

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

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

OTHER

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

Federal Direct PLUS. Parents of dependent students who have a valid FAFSA on file and whose student is enrolled at least half-time may apply for the Direct PLUS Loan. The parent must be a U.S. citizen or permanent resident. Direct PLUS Loan applications are subject to Department of Education credit review. For additional information on the terms and conditions of Direct Loans visit https://studentaid.gov/understand-aid/types/loans/plus. *Note: program is subject to federal legislative changes.*

Standards of Progress for Recipients of Financial Aid

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

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

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

Minimum Cumulative Grade Point Average (GPA)
Students are required to meet the following minimum cumulative GPA requirements:

Classification	*Minimum Cumulative GPA*
First Year Freshmen	1.95
Upperclass Students	2.0

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

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

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

Credits and Grades Used to Determine Pace and Maximum Time Frame
All coursework attempted, including repeated and withdrawn coursework recorded on the student's academic record as of the seventh class day, is considered when calculating pace and maximum time frame and determining whether the student meets satisfactory academic progress.

Course/Grade	*Included in Earned Credits*	*Included in Attempted Credits*
AP (Advance Placement) Credits	X	X
Credit by Exam	X	X
Transfer Credits	X	X
Grades: A, A–, B+, B, B–, C+, C, C–, D, P, S	X	X
Grades: F,F*,I,NR,U,V,W,X		X
Withdrawn courses after seventh class day		X

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

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

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

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

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

the student to meet the requirements of academic progress at a specified future point in time.

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

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

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

Denied Appeals/Students Who Choose Not to Appeal

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

Institute for Social Concerns

The Institute for Social Concerns is an interdisciplinary institute responding to the complex demands of justice through a combination of justice education and research for the common good. We bring people together to think carefully about the world's most pressing social concerns in order to develop creative and effective approaches to addressing them.

- The Institute offers a range of innovative justice education courses on topics such as the environment, labor, mass incarceration, migration, poverty, and technology. Many of these courses fulfill core requirements.
- Interested students may also apply for the McNeill Common Good Fellows, a community of students from across all Notre Dame colleges committed to exploring life's biggest questions through shared coursework, community engagement, faculty-mentored research, and adventure.
- Courses with immersive experiences such as RISE, Proximities, Appalachia, NDBridge, and Social Concerns Summer Fellowships are open to all disciplines, and most are fully funded.
- The Institute houses the Poverty Studies Interdisciplinary Minor and jointly manages the Catholic Social Tradition Minor with the Department of Theology.
- Graduate Justice Fellowships and the Graduate Student Institute for Engaging Research and Teaching are available for graduate students.
- The Institute offers events, workshops, and panel discussions with scholars, activists, artists, and journalists on various justice-related questions.

Visit the Institute for Social Concerns at https://socialconcerns.nd.edu/

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Institute for Social Concerns.* Course descriptions can be found by clicking on the subject code and course number in the search results.

POVERTY STUDIES INTERDISCIPLINARY MINOR WITHIN THE INSTITUTE FOR SOCIAL CONCERNS

Poverty Studies
(socialconcerns.nd.edu/povertystudies)

Director:
Connie Snyder Mick
cmick@nd.edu 574-631-0498

The Poverty Studies Interdisciplinary Minor (PSIM) contributes to Notre Dame's mission to "develop in students a disciplined sensibility to the poverty and injustice that burden the lives of so many" by focusing on the Catholic social teaching principle of the preferential option for the poor. Poverty Studies asks students to examine poverty, injustice, and oppression through research in multiple disciplines and through experiential learning in which students encounter people experiencing and addressing poverty firsthand. Through Poverty Studies, students combine passion, curiosity, knowledge, and skills to discern how they can help create a more equitable world in any profession they choose.

Poverty Studies Interdisciplinary Minor students take four types of courses, for a total of 15 credit hours:

- Capstone Seminar or Special Studies Capstone (3 credits)
- Gateway Course: Introduction to Poverty Studies (3 credits)
- Experiential Courses (3 credits)
- Electives (6 credits)

COURSE DESCRIPTIONS

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

Eck Institute for Global Health

The University of Notre Dame's Eck Institute for Global Health (EIGH) is interdisciplinary and recognizes health as a fundamental human right and works to promote research, training, and service to eliminate health disparities around the world. The EIGH brings together multidisciplinary teams to understand and address health challenges that disproportionately affect the poor and to train the next generation of global health practitioners.

GLOBAL HEALTH MINOR WITHIN THE ECK INSTITUTE FOR GLOBAL HEALTH

Director:
Marie Donahue
Affiliated Faculty:
Visit globalhealth.nd.edu/affiliates

The Global Health Minor (GHM) aligns with the mission of the University to have "a disciplined sensibility to the poverty, injustice, and oppression that burden the lives of so many" and to "create a sense of human solidarity and concern for the common good that will bear fruit as learning becomes service to justice."

The GHM recognizes that health is not limited to treating diseases but that the root causes of health inequality must be addressed. Solutions to these "social determinants of health" require expertise in every discipline—including the social sciences, policy and governance, engineering, education, human rights and ethics. Because of the interdisciplinary nature of global health practice, the GHM is an ideal supplement to every major at the University.

Requirements: The GHM consists of 15 credit hours, including a required gateway course, one research methods course and two elective courses from an approved list or by permission from the director, and a capstone experience.

Gateway course (3 credits): The course provides foundational knowledge necessary to understand what global health is today; its history and evolution; how the application of the biosocial model is necessary to understand global health challenges and in designing effective intervention strategies; and topics such as health inequality, maternal-child health, infectious diseases, noncommunicable diseases, climate change, governance, and relevant international organizations.

Research methods course (3 credits): Students will choose one research methods course from an approved list of courses, which focus on analytical or methodological approaches that are relevant for evaluating and understanding global health issues.

Electives (6 credits): Students will choose two electives from approved courses encompassing a wide range of topics from across all schools and

departments. Students may also take an additional research methods course as one of their electives.

Capstone experience (3 credits): The capstone project provides an opportunity for students to complement coursework with a global health practice experience that can be domestically or internationally based. The capstone project will include the following three components:

Experiential Learning in Global Health Practice: a one-credit course that will prepare students for any fieldwork practice component of the capstone.

Global Health Practice Capstone Project: The practice component is a supervised practical application of global health activities. By the second semester of the junior year, students will write a proposal outlining their practice project, including identifying a faculty mentor to supervise the project. The practice component may be either:

1) Internship/practicum: students will work in a global health setting which may include, community organizations; health departments/agencies; non-governmental, governmental, or international organizations;
2) Research: students will collaborate with a faculty member on a research project. This could include a research paper on a topic of interest (thesis), secondary analysis of an existing data set, or work on an existing project.

COURSE DESCRIPTIONS

To see the courses associated with the minor that will be taught during the upcoming semester, visit classsearch.nd.edu, go to the "Any Subject" dropdown menu, and select "Global Health" Course descriptions can be found by clicking on the subject code and course number in the search results.

Reserve Officers Training Corps Programs

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

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

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

In the School of Architecture, ROTC students are permitted a maximum of six credits of 40000-level air, military or naval science courses as substitutes for electives within the 165 credit hours required for the bachelor of architecture degree.

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

MILITARY SCIENCE AND LEADERSHIP

Chair and Professor:
Lieutenant Colonel William Kobbe
Assistant Professors:
Captain Christian Henderson; Captain Emilie White; Master Sergeant James Kuritz

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

Student Awards and Prizes.
George C. Marshall Award. An award given annually to the top Cadets in US Army Cadet Command. Winners participate in a national seminar with some of the nation's highest ranking leaders in Fort Knox, KY.

The Dixon Award. Named in memory of an alumnus of the Notre Dame Army ROTC Battalion, annually recognizes an outstanding senior who has exemplified the highest professionalism, dedication, and service to the Fightin' Irish Battalion.

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

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

The McKee Award. Named in honor of an alumnus of the Notre Dame Army ROTC Battalion, a commemorative plaque is presented annually to an outstanding member of the Army Color Guard.

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

The Belin Award. A commemorative K-BAR presented annually to the Cadet who served on the Battalion Staff with commitment and excellence. This cadet displayed qualities of military leadership, discipline, and resourcefulness, directly resulting in the success of the Fightin' Irish Battalion.

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

COURSE DESCRIPTIONS

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

NAVAL SCIENCE

Chair and Professor:
CAPT John Smith, USN
Associate Professor:
CDR Matthew Wood, USN
Assistant Professors:
Capt Andrew Hunold, USMC
LCDR Matthew Desrosiers, USN
LT Sean Dunne, USN
LT Adrian Navotas, USN
LT Thomas Yoder, USN

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

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

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

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

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

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

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

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

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

Captain John A. McGurty Jr. Award is a Navy or Marine sword awarded to a Midshipman who has demonstrated superior leadership through entire NROTC career and best embodies the spirit of can-do attitude.

NROTC Carter Family Sword Endowment for Excellence is a Navy or Marine sword who consistently demonstrated the highest standards of leadership, initiative, professionalism, and service before self.

The Commander Ronald Wong ('53) Sword for Excellence are two officer swords awarded to the Honor Company Commander for the Fall and Spring Semester.

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

COURSE DESCRIPTIONS

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

AEROSPACE STUDIES

Chair and Professor:
Colonel Charles M. Freel, USAF
Assistant Professors:
Lieutenant Colonel Travis Clark, USAF
Captain Lindsey Brewer, USAF

The Air Force Reserve Officer Training Corps (AFROTC) Detachment 225 is a premier education and training program designed to give men and women the opportunity to become world-class leaders as Air Force officers while completing an undergraduate four-year academic degree. The AFROTC program develops leadership and management skills that students need to become effective and trusted leaders in the 21st century. In return for perseverance and dedicated efforts, we offer the opportunity for education and training, advancement, and a sense of pride that comes from serving in the United States Air Force. Programs like Project Go offer language immersion opportunities and You Can Fly scholarships are available to those interested in gaining flight hours. Upon completion of the Air Force ROTC program, students are commissioned as second lieutenants in either the United States Air Force or United States Space Force, depending on which path the cadet chooses to follow. Following commissioning, there are excellent opportunities for additional education in a wide variety of academic fields before moving into a new career.

Student Organizations and Activities. All Air Force ROTC cadets are given opportunities to participate in a variety of extracurricular activities to develop their leadership skills. Activities available for AFROTC cadets include: the Arnold Air Society (AAS), a group dedicated toward service in the local community; Veterans Day Vigil; the annual Flying Irish Basketball Tournament, which is the largest ROTC cadet-run event in the country; the TriMil Cup, played between the three ROTC branches; study abroad programs; intramural and varsity athletics; University band and cheerleading activities, as well as the Honor Guard. The Honor Guard performs at campus and community functions while developing individual drill proficiency. Foreign language programs, engineering programs, and cultural leadership studies are also available during the summer when the opportunity becomes available. There are typically several opportunities throughout the year to travel to different universities and active duty bases if a cadet is in good standing and nominated by detachment cadre.

Student Awards and Prizes.

The Commander's Leadership Award, and an Air Force officer's sword, are presented to the top graduating senior in Air Force ROTC for their strong academic record and outstanding character, leadership, and officer potential.

The LtCol James Fowler Award, named in memory of a 1959 alumnus of Notre Dame Air Force ROTC program, is given to a rated officer candidate in the

junior class who truly personifies LtCol Fowler's legacy of service before self. The awardee receives a sculpture that "honors the heroes of the sky—our American pilots who soar up in the area and tell stories with their hands," (artist: Michael Garman, "And There I Was").

The Nöel Dubé Memorial Award, named in memory of a 1970 alumnus of the Notre Dame Air Force ROTC program, is presented to a senior Arnold Air Society member who carries the most wing spirit, holds the most potential as an officer, and has contributed the most to furthering the ideals and goals of the society within the University and the local community. The cadet is also awarded an Air Force officer's sword.

The Captain Paul Robérge Leadership Award, named in memory of an 1981 alumnus of the Notre Dame Air Force ROTC program, annually recognizes the top senior pilot candidate who most exhibits the leadership characteristics that exemplify the Air Force core values of integrity, service before self, and excellence in all we do. The chosen cadet is also awarded an Air Force officer's sword. In addition, one junior, sophomore and freshman with the same characteristics are recognized with a small monetary award.

The Captain Reid Nishizuka Award, named in memory of an 2005 alumnus of the Notre Dame Air Force ROTC program, is given to a senior/commissioning cadet that most embodies Captain Nishizuka's superior mentorship capabilities, cheerful disposition and utmost professionalism. The cadet is also awarded an Air Force officer's sword.

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

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Air Force-Aerospace Studies.* Course descriptions can be found by clicking on the subject code and course number in the search results.

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

Study Abroad & Off-Campus Programs

Notre Dame Global's Study Abroad offers over 70 study abroad programs in more than 30 countries during both the academic year and summer.

For over 55 years, Notre Dame has made it possible for students to earn credits toward graduation by participating in study abroad programs. Study in another tradition, direct personal experience of another language and culture, and travel, all broaden and deepen the liberal education of the whole person to which the University has always been committed. Study abroad programs are one of the many opportunities open to students seeking an international experience that will complement their study plan.

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

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

Qualified students from all undergraduate colleges may apply to spend a semester or a year abroad in one of our study abroad programs. Participation is typically during the junior year, but some programs are designed to accommodate sophomores as well as seniors. Currently, only select study abroad programs are approved by the Department of Veteran Affairs to be certified under education benefit chapters. To determine if a program is approved, reach out to Notre Dame Global or the primary School Certifying Official for VA educational benefits in the Office of the Registrar.

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

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

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

Students are eligible to apply for a leave of absence through their college for study in a program offered by another college or university. *They may not, however, take a leave of absence to attend international programs at sites (schools) where Notre Dame offers its own study abroad programs.* The information published here summarizes the planned study abroad opportunities at the University of Notre Dame for the 2025–26 academic year. Please consult the Study Abroad office's website at https://studyabroad.nd.edu/ for the latest information.

ACADEMIC YEAR PROGRAMS

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

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

In Africa, the Middle East, and Eastern Europe, students have the option to participate in programs in Jerusalem and Tel Aviv, Israel; Amman, Jordan; Rabat, Morocco; Stellenbosch, South Africa; Nairobi, Kenya; and Almaty, Kazakhstan.

Notre Dame also offers programs in the Asia-Pacific region in Fremantle, Perth, and Sydney, Australia; Shanghai, Beijing, Shenzhen, and Hong Kong, China; Mumbai and Sonipat, India; Nagoya and Tokyo, Japan; Seoul, South Korea; and Singapore.

The Rome International Scholars program offers a semester of specialized study in Rome and funding for disciplinary study and/or a practicum during the summer following the semester of study. The Sustainability Scholars Program offered in Santiago, Chile allows students from any academic discipline the opportunity to engage in sustainability-related coursework and independent research, with funding available for related travel and expenses.

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

Instruction is in Arabic and English in Amman; Chinese and English in Beijing, Shanghai, Shenzhen,

and Hong Kong; English in Athens, Budapest, Dublin, Durham, Fremantle, Galway, Jerusalem, Leuven, London, Mumbai, Norwich, Oxford, Perth, Rabat, Seoul, Singapore, St. Andrews, Stellenbosch, and Sydney; French in Angers and Paris; German in Berlin and Heidelberg; Italian in Bologna; Italian and English in Rome; Japanese and English in Nagoya, and Tokyo; Portuguese and English in São Paulo; and instruction is in English and Spanish in Mexico City; and Spanish in Alcoy, Puebla, Santiago, and Toledo.

SUMMER PROGRAMS

International summer programs for students who have completed at least one year of studies at Notre Dame are available in São Paulo, Brazil; Santiago, Chile; Paris, France; Corinth, Greece; Mumbai, India; Dublin, Ireland; Jerusalem, Israel; Milan and Rome, Italy; Mexico City, Mexico; Lisbon, Portugal; Warsaw, Poland; Cape Town, South Africa; Bangkok, Thailand; Kampala, Uganda; and London, United Kingdom. The locations of the faculty-led summer programs may vary from year to year. The length of the programs and the credits offered also vary by program.

Specialized summer programs include international internships through the Global Professional Experience and research through the Global Research Experience program in Brazil, Chile, China, India, Italy, Jerusalem, Kenya, Mexico, and the UK. See the Study Abroad website for detailed information about each summer program.

AUSTRALIA: PERTH – UNDA

Semester
University of Notre Dame Australia (UNDA)
Study Abroad Office | 32 Mouat Street | Fremantle, W. Australia 6160 |Australia

Students in the Colleges of Business and Arts & Letters enroll in courses at the University of Notre Dame Australia (UNDA) through this program. Students enroll in five courses (15 credits) either semester in any combination depending on their major, college requirements, and individual need. A list of course offerings for the fall normally is available around April and for the spring term around October.

AUSTRALIA: PERTH – UWA

Semester
University of Western Australia (UWA)
35 Stirling Highway | Crawley 6009 | Perth, Western Australia |Australia

The Perth program is designed for juniors and is open to students from the colleges of Engineering and Science. Students in Arts and Letters, especially pre-professional and anthropology majors, may also apply. Engineering students may be able to take a technical elective course at UWA and are encouraged to work closely with their advisors to identify appropriate options. All students will carry 30 UWA credit points, which translate to 15 Notre Dame credits. All students enroll in a self-guided, non-credit online course called Indigenous Studies Essentials, which all undergraduate students at UWA complete. Students have the opportunity to engage in research projects and for-credit internships during their semester in Perth.

AUSTRALIA: SYDNEY PROGRAM

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

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

BELGIUM: LEUVEN PROGRAM

Spring Semester
Katholieke Universiteit Leuven (KU)
Oude Markt 13, 3000 Leuven, Belgium

The exchange program at *Katholieke Universiteit Leuven* is open to qualified juniors and best suited for students in the College of Science. This program operates only in the Spring semester. Students can take courses across disciplines like Biology, Chemistry, and Ecology, learning from leading researchers from across the continent. Beyond the classroom, students will have the chance to engage in hands-on research alongside faculty, gaining invaluable experience in a globally renowned scientific community.

BRAZIL: SÃO PAULO PROGRAMS

Semester
Fundação Getulio Vargas (FGV-EAESP)
Casa Verde Building, Rua Silvia, 23,
Building 05-10 & 12, Bela Vista, Brazil

The São Paulo School of Business Administration, FGV-EAESP, is widely recognized as the best business school in Brazil. Some Spanish or Portuguese proficiency is encouraged, but not required, as FGV offers a wide selection of business and elective courses in English. Students have the opportunity to take an intensive Portuguese language course.

Semester
Pontificia Universidade Catolica - São Paulo (PUC-SP)
R. Monte Alegre, 984 | Perdizes, São Paulo | SP, 05014-901, Brazil

Students with Portuguese proficiency may study at PUC-SP, a top-ranked private university in Brazil. PUC-SP offers courses primarily in the social sciences and humanities, as well as some degree programs in science, engineering and technology. This program is best suited for A&L students with an interest in studying Portuguese, Brazilian Studies, Poverty Studies or Sociology.

CHILE: SANTIAGO PROGRAM

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

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

CHINA: BEIJING PROGRAMS

Spring Semester
Beijing-PKU | Peking University | 5 Yiheyuan Road |Haidian Qu | Beijing, China, 100080

The Beijing-PKU program is a direct enroll exchange program at Peking University that allows students to take their classes alongside local and other international students. The program is recommended for students from the College of Arts and Letters and the Mendoza College of Business, but students from the College of Science may also apply. Students can choose to study intensive Chinese language or take classes in English in a variety of subject areas.

Semester
Beijing-TBC | The Beijing Center | No. 10 East Street Chaoyang District | Beijing, China 100029

Participants in the Beijing Center program study China while living in China. There is no Chinese language prerequisite. All courses, except Chinese language courses, are taught in English by local professors and practitioners in the fields of Asian studies, business, communication, fine and performing arts,

history, literature, philosophy, political science, sociology, and theology. Students are required to take a Chinese language class. Each semester students participate in a cultural excursion—Silk Road Excursion in fall and Yunnan Trip in spring—that explores and expands understanding of the history and cultures of China. Students live on the campus of University of International Business and Economics (UIBE) where the Beijing Center is located.

Spring Semester
Tsinghua University
Bei Jing Shi | China

Founded in 1911, Tsinghua University has the prestigious reputation as a top engineering school in China—and the world with over 300 courses fully taught in English for exchange students. Students will directly enroll into Tsinghua University as an exchange student during their semester abroad and will take classes either in English or Chinese alongside local and other international students.

CHINA: HONG KONG PROGRAMS

Spring Semester
Chinese University of Hong Kong (CUHK)
Shatin, N.T. | Hong Kong, China

The CUHK program is an exchange program open to juniors and is particularly suited to students studying the humanities, business, engineering, or science. CUHK is a bilingual, bicultural institution with local and international students and scholars. CUHK receives students from over 180 academic institutions worldwide. No Chinese language study is required, and students may choose from many courses that are taught in English or take courses taught in Chinese (if they meet the language requirement). Students may choose courses from the faculty of arts, business administration, engineering, science, or social science. In addition to this, students may also take courses from the International Asian Studies Program. This program includes Chinese, Asian, and international studies courses and Chinese language courses.

Fall Semester
University of Hong Kong (HKU)
Polfulam Road | Hong Kong, China

The HKU exchange program is open to juniors who wish to study in Hong Kong for one semester. The program is suited for students in the Colleges of Arts and Letters, Business, Engineering, or Science. No Chinese language is required. All courses (except those offered by the Department of Chinese) are taught in English. The University of Hong Kong is a dynamic, comprehensive university of world-class standing and a leading international institution of higher learning in Asia.

Semester Program
Hong Kong University of Science and Technology (HKUST)
Clear Water Bay | Kowloon | Hong Kong, China

The HKUST program is an exchange program open to juniors and is particularly well-suited to students in the Colleges of Science and Engineering, although students from the Colleges of Arts and Letters and Business may also apply. HKUST is a top-rated international research university dedicated to excellence in education and research. HKUST receives students from over 250 academic institutions worldwide. No Chinese language study is required, and students may choose from many courses that are taught in English or take courses taught in Chinese if they meet the language proficiency requirement. Internships are available.

CHINA: SHANGHAI PROGRAM

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

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

DENMARK: COPENHAGEN PROGRAM

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

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

FRANCE: ANGERS PROGRAM

Semester or Academic Year
Two available tracks (CIDEF & UCO)

UCentre International d'études Françaises (CIDEF)
3, place André Leroy | BP 10808 | 49008 Angers, France

The Angers-CIDEF program is open to sophomores and juniors in all colleges. Declared and prospective French majors must consult with the Department of Romance Languages and Literatures before they apply for the program. Students will be fully immersed in the French language as all courses are taught in French and students will have the opportunity to live a Parisian life with their host families. Students looking to participate in a full academic year or just the Fall semester will begin with a month-long language intensive summer session.

Université Catholique de l'Ouest (UCO)
3, place André Leroy | BP 10808 |49008 Angers, France

The Angers-UCO program is open to sophomore, junior, and senior students with a more advanced understanding of French. This unique direct enroll track will provide students the opportunity to go beyond language learning by focusing on subject matter comprehension across varying subjects and disciplines with French native students. Courses available in this track will be taught in both French and English across a multitude of disciplines and subjects to meet academic requirements. Students will have the opportunity to live with host families or within student residences in Angers.

FRANCE: PARIS PROGRAM

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

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

Semester or Academic Year
Universite de la Sorbonne Nouvelle—
Sorbonne Nouvelle University (Paris III)
8 avenue de Saint-Mandre | 75012 Paris, France

Located in the intellectual heart of Paris, the *Universite de la Sorbonne Nouvelle* welcomes students for a semester or year-long exchange. Founded after the split of the historic University of Paris, Sorbonne Nouvelle University offers high-level multi-disciplinary degrees in fields of Modern Languages, Literature, Arts, Social, and Human Sciences. Qualified junior applicants will be immersed in the multitude of courses taught in French and English stretched across the three campuses located around Paris. Students interested in participating in this program will be presented with countless opportunities to integrate further into the Parisian culture and

community at one of France's most internationally focused institutions.

GERMANY: BERLIN PROGRAM

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

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

GERMANY: HEIDELBERG PROGRAM

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

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

GREECE: ATHENS PROGRAM

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

CYA offers an extensive range of academically outstanding courses and unique learning opportunities spanning a wide range of disciplines from Ancient to Contemporary studies, enriched by hands-on learning opportunities and on-site classes. In addition to Anthropology, Art History & Archaeology, and Classical Languages of Ancient Greek and Latin, students are offered classes in Communications, Economics, Environmental Studies, History, Literature, Modern Greek, Philosophy, Political Science & International Relations, Religion, and Urbanism & Sustainability. Notre Dame students attending this program will study with students from other American universities who are also studying at CYA.

HUNGARY: BUDAPEST PROGRAM

Semester
Budapest Semesters in Mathematics (BSM)
Bethlen Gábor tér 2, Budapest, 1071 Hungary

This program is designed for high-achieving mathematics majors eager to explore a wide variety of topics at the intermediate and advanced level. BSM classes are held at the College International, a Hungarian-based educational institution focusing on international students studying in Budapest, and taught in English by eminent international scholars. Students in the Budapest program have the option to participate in a two-week intensive Hungarian language course prior to the start of the semester.

INDIA: MUMBAI PROGRAM

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

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

INDIA: DELHI PROGRAM

Spring Semester
Ashoka University
National Capital Region Sonipat, Haryana 131029

Ashoka University is India's premier liberal arts and sciences university, located in the Delhi NCR capital region. It is a pioneer in its focus on providing a liberal arts education on par with the best in the world. Ashoka University welcomes students from international institutions across the globe to experience the university's unique academic offerings through the Visiting Student Programme (VSP).

IRELAND: DUBLIN PROGRAMS

Semester
University College Dublin (UCD)
Belfield | Dublin 4, Ireland
Trinity College Dublin (TCD)
College Green | Dublin 2, Ireland
Dublin City University (DCU)
International Office | Drumcondra | Dublin 9, Ireland

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

IRELAND: GALWAY PROGRAM

Semester
The University of Galway
International Office |7 Distillery Road | Galway, Ireland

Notre Dame students have an opportunity to study in the cultural center of Ireland at the University of Galway, the largest and oldest university in the west of Ireland. It is a leading research university in biomedical science and engineering, marine science, energy and environmental science. Additionally, the University of Galway promotes study of the humanities, including Irish Studies, to provide for the study of modern and contemporary Irish literature, music, history, language and culture.

ISRAEL: JERUSALEM PROGRAM

Semester
University of Notre Dame at Tantur
PO Box 11381 | 91113 Jerusalem, Israel

Notre Dame's program in Jerusalem at Tantur is located on a hilltop on the road from Jerusalem to Bethlehem. Students will take courses at Tantur. Additionally, students can choose from a variety of classes offered in English at local universities, including Hebrew University and Bethlehem University. Taking classes at these institutions affords them the opportunity to interact with local students from Israel and Palestine. Arabic and Hebrew language classes are also available. Students will also have the opportunity to participate in internships, for credit, with NGOs. There will be numerous excursions throughout the Holy Land, which serves to enhance the material covered in classes.

ISRAEL: TEL AVIV PROGRAM

Spring Semester
Tel Aviv University (TAU)
Tel Aviv 69978, Israel

The Tel Aviv exchange program allows Notre Dame students the opportunity to study and live directly alongside their peers at Tel Aviv University (TAU). Students attend classes at TAU and live with fellow international students in student dorms or apartments in downtown Tel Aviv. TAU offers coursework

suitable for Arts and Letters students, particularly those in the following majors: History, Philosophy, Middle Eastern Studies, Political Science, Pre-Law, Psychology, American Studies, and Arabic language. Opportunities may be available for students in the College of Science and the College of Engineering. TAU is about 40 minutes away from The University of Notre Dame at Tantur (UNDT) facility, home of the Jerusalem Global Gateway undergraduate program and the Tantur Ecumenical Institute.

ITALY: BOLOGNA PROGRAM

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

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

ITALY: ROME – AME PROGRAM

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

The Rome Aerospace and Mechanical Engineering (AME) Program is taught by Notre Dame faculty at the Rome Global Gateway in cooperation with La Sapienza. Students will take three AME courses, one Global Gateway course, *All Roads Lead to Rome,* and one theology course that may vary from year to year. Proficiency in Italian language is not required; instruction is in English. Participants must be approved by the College of Engineering.

ITALY: ROME – ICCS PROGRAM

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

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

ITALY: ROME UNDERGRADUATE PROGRAM

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

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

JAPAN: NAGOYA PROGRAM

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

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

JAPAN: TOKYO PROGRAMS

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

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

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

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

KAZAKHSTAN: ALMATY PROGRAMS

Semester or Academic Year
Al-Farabi Kazakh National University
Al-Farabi Avenue 71 | Almaty 050040 | Kazakhstan

This program provides an intensive, immersion-based study of Russian language with an emphasis on Central Asian culture and society. Coursework typically includes phonetics, grammar, and conversation, as well as composition, oral comprehension, and reading. Language courses also cover topics in literature, history, politics, culture, mass media, and area studies. The program offers a wide range of extracurricular activities, including volunteer opportunities and community service, regional field studies, conversation partners, and discussion groups with local students.

KENYA: NAIROBI PROGRAM

Fall Semester Only
Strathmore University
Madaraka Estate | Nairobi, Kenya

Strathmore University (SU) is home to over 4,000 students and its student population represents over 40 different nationalities. Strathmore College was started in 1961 and was the first in pre-independence Kenya to accommodate students of all races, religions, and social standing. Saint Josemaría Escrivá, founder of Opus Dei, inspired and encouraged them to start the College, a group of professionals who formed a charitable educational trust (now the Strathmore Educational Trust). While SU was originally renowned for their Accountancy program, students are now studying Computing and Engineering Sciences, Business, Law, Humanities & Social Sciences, and Tourism and Hospitality.

JORDAN: AMMAN PROGRAM

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

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

MEXICO: PUEBLA PROGRAM

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

The program is open to students from all colleges at Notre Dame with the equivalent of four semesters or better in Spanish language. Notre Dame offers a pre-medical program in the fall semester at UPAEP, which includes the first semester of General Physics (taught in English). During the spring semester, students may participate in an internship in a variety of fields such as public policy, business, sustainability, or education. International excursions are also a part of the spring semester. Excursions are coordinated by on site ND staff. Students live with host families.

MEXICO: MEXICO CITY PROGRAM

Semester
Tecnologico de Monterrey-Ciudad de Mexico Campus
Calle del Puente #222 | Col. de Huipulco | Tlalpan, 14380, Mexico D.F., Mexico

This is an exchange program with Mexico City campus of Tec de Monterrey, a private, non-profit institution that is consistently ranked the top university in Mexico and one of the top 10 universities in Latin America. There are course offerings in both English and Spanish in engineering, sciences, business, economics, political science, global affairs, communication, arts and design, and more. Students have the opportunity to apply for research or an internship, and they can also take up to three Tec21 Block courses during a semester which offer hands-on learning experiences. Students can live with a host family vetted by Tec de Monterrey or in off-campus lodging near campus.

MOROCCO: RABAT PROGRAM

Semester
School for International Training (SIT)
CCCL | Avenue Laalou, DerbJirari | Zankat Elhassani, #11 | Rabat Medina, Morocco 10101

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

SEMINARIAN PROGRAMS: VARIOUS LOCATIONS

Semester

Rome
Pontifical University of Saint Thomas Aquinas (Angelicum)
Largo Angelicum 1, Roma, Italy

Santiago
Pontificia Universidad Catolica de Chile (PUC)
Campus San Joaquin, Av. Vicuna Mackenna 4860, Macul | Santiago, Chile

Twickenham
St. Mary's University
Waldegrave Road | Strawberry Hill, Twickenham | London, United Kingdom

The Seminarian study abroad programs are designed specifically for Old College undergraduate students. Old Collegians can study abroad in Rome, Italy, Santiago, Chile; or Twickenham, England while continuing their discernment toward a call to religious life. Students will take classes that fulfill degree requirements, live in community with other seminarians and novices from around the world, and gain pastoral experience in parishes, schools, hospitals, or hospice care.

SINGAPORE: SINGAPORE PROGRAM

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

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

SOUTH AFRICA: STELLENBOSCH PROGRAM

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

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

SOUTH KOREA: SEOUL PROGRAM

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

The Seoul exchange program is open to sophomores and juniors. It is particularly suited to students in Liberal Arts, Economics, Business, Science, Engineering, Life System, Korean Language, Social Science, and Korean Studies. Yonsei is a private Christian research institution with local and international students and scholars and is one of the oldest universities in South Korea. Yonsei receives students from more than 290 academic institutions worldwide. Instruction is in Korean but students may also choose from over 800 courses that are taught in English, and Korean language skills are not a requirement to participate in the program. Students may also choose courses from the various other faculties.

SPAIN: ALCOY PROGRAM

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

This exchange program accepts Notre Dame undergraduate engineering students to study during the spring semester of their sophomore or junior academic year. The program is designed for undergraduate computer science and computer engineering students. Courses are conducted through the Polytechnic University of Valencia in Alcoy, Spain. Courses are taught in Spanish.

SPAIN: TOLEDO PROGRAM

Semester or Academic Year
Fundación Ortega-Marañón (FOM)
Callejon de San Justo | 45001 Toledo, Spain

The Toledo program is open to students of all majors, but is a particularly good fit for those in the College of Arts & Letters due to the program's abundance of courses in the arts and humanities. Students may study during the fall or spring semester and must have completed the equivalent of four semesters of college-level Spanish before arriving on-site. All classes in the Toledo program are taught fully in Spanish. A philosophy course is offered in the fall. Credit-bearing internships are available in Toledo. Students may apply for internships in several areas, including government, the arts, social service, and communications. Students can choose to live in a dormitory with other students, or with a local host family vetted by the program staff.

SWITZERLAND: GENEVA PROGRAM

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

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

UNITED KINGDOM: DURHAM PROGRAM

Academic Year
Durham University
Stockton Road, DURHAM, DH1 3LE, UK

Durham is one of the UK's most historic universities and one of the world's leading universities in the rankings, with academic staff who are acknowledged as experts in their fields and are at the forefront in their subjects. Students participating in this program have the opportunity to engage in a number of research opportunities and are encouraged to work independently using all the academic resources which are available. Modules are taught via a combination of lectures, tutorials or a research project depending on your area of study. Durham University operates in three terms from September through June. Students from Arts & Letters, Engineering, Science and Mendoza are eligible to apply. A GPA of 3.0 or higher is required.

UNITED KINGDOM: LONDON UNDERGRADUATE PROGRAM

Semester
Notre Dame London Global Gateway
1 Suffolk Street | London SW1Y 4HG | United Kingdom

The London Undergraduate Program was initiated in 1981 as an Arts and Letters program and has since expanded to provide an opportunity for all Notre Dame undergraduates from the colleges of arts and letters, business, engineering, Keough school of global affairs, and science to spend one semester of their junior year in the London Undergraduate Program. While in London, students take classes offered by Notre Dame and British professors at the University of Notre Dame in London near Trafalgar Square. Notre Dame's British faculty is selected to include experts whose work is internationally recognized in their fields. Students participating in the program live as a group in Conway Hall, a Notre Dame residential facility with supervision provided by the program. Arts and Letters students who are interested in independent research can apply to be a Kennedy Scholar. Those selected to be Kennedy Scholars participate in a 3-credit research seminar in which they examine research methodologies, visit prominent centers of research and culture, and ultimately prepare individual prospectuses for senior projects. Additionally, they take four other courses offered at the London Global Gateway. Kennedy Scholars will be eligible to apply for various research grants to begin or continue their research in the summer following their semester in London or early in their senior year. In particular, these students will be extremely qualified for a prestigious Kennedy Undergraduate Research Opportunity Program (UROP) grant. Students have the opportunity to apply for a 3-credit internship or placement-based opportunities from a variety of different areas, including government, corporations, charities, schools, educational labs, and the arts.

UNITED KINGDOM: NORWICH PROGRAM

Semester
University of East Anglia (UEA)
Norwich Research Park | Norwich NR4 7TJ | United Kingdom

Notre Dame students can enroll in UEA's wide range of courses in American studies, American and English literature, and creative writing. The School of American Studies has a special reputation in creative writing. The School houses the Arthur Miller Centre for American Studies, which hosts an annual international literary festival featuring notable writers. The UEA exchange program is open to juniors with a GPA of 3.0 or higher.

UNITED KINGDOM: OXFORD PROGRAM

Academic Year
New College and Oriel College, Oxford University
Oriel Square | Oxford, OX1 4EW

This program provides juniors in the colleges of science, engineering, and arts and letters the opportunity to study at Oxford for a full academic year. Each Oxford college dictates the fields in which they will accept students. It is required that candidates have an overall GPA of 3.8 at the time of application. At Oxford, students participate in Oxford's celebrated tutorial system. Students work individually or in small groups with a tutor to pursue their major courses of study in depth. Tutors are full-time faculty at Oxford. They include some of the most accomplished scholars in the world in their fields. Participating students live in New College or Oriel College accommodations.

UNITED KINGDOM: ST ANDREWS PROGRAM

Semester
University of St Andrews
College Gate | St Andrews | KY16 9AJ | Fife, Scotland, UK

The University of St Andrews is renowned for its academic strength in numerous disciplines. This selective program is open to most majors in the College of Arts and Letters, as well as thos studying Computer Science, and requires a minimum 3.5 cumulative GPA. Students apply in the fall semester of their sophomore year to study at St Andrews in either semester of their junior year.

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

DOMESTIC OFF-CAMPUS PROGRAMS

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

WASHINGTON, D.C.: THE WASHINGTON PROGRAM

Semester
University of Notre Dame Washington Program
1400 16th St, NW
Washington, D.C. 20036

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

Moreau Program

"[Education] is the art of helping young people to completeness…"
from Blessed Basil Moreau, Christian Education

The Moreau Program is a reflection of the distinct manner in which Notre Dame seeks to integrate academic rigor with personal growth, bringing together students, faculty, and staff from across all departments in a shared endeavor to study and practice living well.

The Moreau First-Year Seminar is the first component of the Moreau Program and a requirement of the University of Notre Dame's Core Curriculum. The course provides students an opportunity to study and practice living well. Students' inquiry is informed by diverse texts, contemporary authors from our community, the perspectives of instructors and peers, and co-curricular experiences. Students address perennial questions about worth, purpose, and relationships with others, the world, and God. Animated by Notre Dame's Catholic mission and a sacramental vision of God working through persons, students engage such questions in community. Students join their peers in stepping back from the routines and tasks of life, considering their lives at Notre Dame as a whole, and participating in the life-long endeavor of living well. Students also take a second required one-credit course at the end of their undergraduate studies as part of the Moreau Program. More information can be found at moreaufirstyear.nd.edu.

COURSE DESCRIPTIONS

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

Information Technology

The Office of Information Technology (OIT) is the central division that supports computing at Notre Dame. The OIT manages the products and services that you will use every day to complete tasks related to your studies and jobs.

Notre Dame provides students with an @nd.edu email account hosted by Google. Google also provides students with access to tools such as Calendar, Drive and Chat.

Each student living in undergraduate residence halls and graduate student residences has access to the internet via the eduroam wireless network, which is available throughout most of campus.

OIT has also partnered with major cellular telephone providers, including AT&T, Sprint/T-Mobile and Verizon Wireless, to provide enhanced coverage.

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

The OIT supports computer labs across campus. Students, faculty, and staff have access to these labs that contain both Windows and Mac computers, as well as virtual desktops that can be used to also access licensed software.

The Service Desk can provide assistance to students with computer questions, as well as questions about supported software applications, network configuration, operating system, file storage, etc. You can reach the Service Desk via phone at 574-631-8111 or email at servicedesk@nd.edu. It is located at 115 DeBartolo Hall.

An extensive knowledge base and self-service portal (servicenow.nd.edu) is also available 24/7. It can be used to find most answers to IT questions with the convenient search or automated chat feature.

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

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

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

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

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

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

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

The Meruelo Family Center for Career Development

The Meruelo Family Center for Career Development serves all Notre Dame undergraduate students in all stages of the career development process. The staff of professionals prepare students for lifelong career readiness by guiding them to discern, pursue, and achieve career goals that align with their values, interests, and skills.

OUR SERVICES

One-on-One Appointments—Our career consultants and counselors meet with students to assist with self-assessment, career decisionmaking, industry exploration, resumes, cover letters, job and internship searches, and interviewing. Appointments can be scheduled through Handshake.

Workshops—Career counselors host career development skill-building workshops on numerous topics, including but not limited to: resumés, networking, interviewing, and industry-specific job search strategies.

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

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

Interview Rooms—The Center for Career Development offers 40+ rooms on the 5th floor of Duncan Student Center where students can interview with employers participating in on-campus recruiting. Rooms are available for virtual interviewing and post-graduate exam preparation.

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

Hours of Operation

- Monday–Friday: 8:00 am to 5:00 pm
- 15-minute walk-in appointments and peer student advisor consultations are available when regular classes are in session. Virtual appointments are available upon request. For the most up to date information, visit: careerdevelopment.nd.edu.
- Virtual appointments are available upon request.

Holy Cross Seminary Formation

The undergraduate seminary (Old College) is housed in the original campus structure built in 1843 by Notre Dame's founder, Holy Cross priest Rev. Edward Sorin, C.S.C., and 7 Holy Cross brothers. It serves as the residence for those undergraduate men who are exploring a vocation as a priest or brother in the Congregation of Holy Cross. With more than 50 men in formation in the United States alone, Holy Cross is a growing, international religious community with 1,400 priests, brothers, seminarians, and brothers in formation in 17 countries throughout the world.

Old College provides an introduction to religious life and ministry in Holy Cross through participation in daily Mass, the Divine Office, Eucharistic Adoration, spiritual direction, service placements, weekly community nights, retreats, and academics (including courses in philosophy and theology). Students in Old College may select their major and tailor the rest of their academic program accordingly. Old Collegians take all classes with other Notre Dame students and actively participate in clubs, organizations, and other aspects of campus life. They are also encouraged to spend a semester or year abroad. Old College combines a challenging religious formation structure with a complete Notre Dame undergraduate experience.

Moreau Seminary, also located on the Notre Dame campus, is the primary scholasticate (house of studies) for the Congregation of Holy Cross in the United States. It is the formation community for both postulants and for temporarily-professed seminarians and brothers.

The one-year Postulancy is a pre-Novitiate year designed for those with a bachelor's degree in any field who wish to discern a vocation to priesthood or brotherhood within vowed religious life. Postulants typically take 15 hours of philosophy and/or theology credits at the University each semester and have ministry placements supervised by seminary staff.

Upon completion of the Novitiate, newly-professed seminarians and brothers begin their formal theological studies and pastoral training in the Master of Divinity program at Notre Dame.

Postulants, seminarians, and brother scholastics live together at Moreau Seminary with perpetually-professed Holy Cross priests and brothers. They discern their vocation and prepare for active ministry by way of human, spiritual, intellectual, and pastoral formation. They receive regular spiritual direction and participate in a vibrant community life centered around common prayer (e.g., daily Mass, Divine Office, and Eucharistic Adoration) and common table.

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

For additional information, please contact:

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

Saint Mary's College

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

Center for University Advising; Undergraduate Education

Director, Learning Resource Center STEM Learning:
Greg Macklem
Director, Academic Services:
Chris Temple
Program Director for Centralized Advising Services:
Kate Broadbent
Senior Exploratory Advisor:
Katharine Mahon

OVERVIEW

The Center for University Advising (CUA) provides support and programming to broaden opportunities for intellectual enrichment and to foster connections between faculty members, staff, and students.

CENTRALIZED ADVISING SERVICES

Centralized advising services supplement academic advising work conducted by collegiate-level advisors. These efforts include managing the academic onboarding of incoming first-year students, facilitating the collective aspects of first-year registration for the fall and spring semesters, and aiding in the planning and execution of Welcome Weekend. Additionally, the CUA supports academic discernment for undergraduate students through an exploratory advising program, and offers continuing professional development opportunities to the broader advising community on campus.

LEARNING RESOURCES

The Learning Resource Center (LRC) provides undergraduate students with the academic help they need to transition successfully into the University. The LRC offers a portfolio of services including resources to help students think about their study habits and academic tutoring to support students in specific courses. All sessions are free and are intended to supplement a student's layered strategy for academic success. Learn more about the types of services on the LRC website https://advising.nd.edu/academic-support/.

CREDIT AND/OR PLACEMENT BY EXAMINATION

Up-to-date information on Advanced Placement (AP), International Baccalaureate (IB), and other forms of exam-based course credit pertinent to first-year students is maintained on the Center for University Advising website at https://advising.nd.edu/first-year-and-incoming-students/requirements-and-credits/advanced-credit-and-placements/. Synoptic charts of exams and equivalences appear on following pages.

The maximum number of credit hours allowed each semester for an undergraduate student varies by college or school and is determined by the dean (or dean's designee) of each college or school. The chart below is only reflective of main campus maximum credit hours.

MAXIMUM CREDIT HOURS PER SEMESTER BY COLLEGE

College	Classification	Maximum Credit Hours/Fall Semester	Maximum Credit Hours/Spring Semester
Arts & Letters	01 – First Year	18.000	17.000
	02 – Sophomore	17.000	17.000
	03 – Junior	17.000	17.000
	04 – Senior	17.000	17.000
Architecture	All	19.000	19.000
Business	01 – First Year	18.500	17.500
	02 – Sophomore	17.500	17.500
	03 – Junior	19.000	19.000
	04 – Senior	19.000	19.000
Engineering	All	19.000	19.000
Global Affairs	01 – First Year	18.000	17.000
	02 – Sophomore	17.000	17.000
	03 – Junior	17.000	17.000
	04 – Senior	17.000	17.000
Science	01 – First Year	19.000	18.000
	02 – Sophomore	18.000	18.000
	03 – Junior	18.000	18.000
	04 – Senior	18.000	18.000

ADVANCED PLACEMENT EXAMINATIONS—NOTRE DAME CREDIT

Advanced Placement Exam	AP Grade Required	Number of Credits Awarded	Notre Dame Equivalent Course	Notre Dame Exam Course Credited (if different)
Biology	5	8	**Biological Sciences** 10161 and 10162	**Biological Sciences** 10098 and 10099
Biology	4	3	**Biological Sciences** 10101	**Biological Sciences** 10091
Calculus AB	5	4	**Mathematics** 10550	**Mathematics** 10091
Calculus BC	5	8	**Mathematics** 10550 and 10560	**Mathematics** 10091 and 10092
Calculus BC/AB Subscore	5	4	**Mathematics** 10550	**Mathematics** 10091
Chemistry	5	4	**Chemistry** 10171	**Chemistry** 10097
Chemistry	4	3	**Chemistry** 10101	**Chemistry** 10091
Economics (Micro)	5	3	**Economics** 10010	**Economics** 10091
Economics (Macro)	5	3	**Economics** 10020	**Economics** 10092
English Language and Composition	4	3	**Writing and Rhetoric** 13100	
Government (American Politics)	5	3	**Political Science** 10100	**Political Science** 10098
Government (Comparative)	5	3	**Political Science** 10400	**Political Science** 10099
History				
European History	5	3	**History** 10020	**History** 10092
United States History	5	3	**History** 10010	**History** 10091
World History	5	3	**History** 10030	**History** 10093
Latin	4	8	**Latin** 10001 and 10002	
Latin	3	4	**Latin** 10001	
Music Theory	5	3	**Music** 10090	**Music** 10099
Physics I	5	3	**Physics** 10111	**Physics** 10091
Physics II	5	3	**Physics** 10222	**Physics** 10092
Physics C, Mechanics	5	4	**Physics** 10310	**Physics** 10093
Physics C, Mechanics	4	4	**Physics** 20210	**Physics** 10095
Physics C, Elec. & Magnetism	5	4	**Physics** 10320	**Physics** 10094
Physics C, Elec. & Magnetism	4	4	**Physics** 20220	**Physics** 10096
Psychology	5	3	**Psychology** 10000	**Psychology** 10091
Statistics	5	3	**Applied** and Computational Mathematics and Statistics 10140	**Applied** and Computational Mathematics and Statistics 10091

ADVANCED PLACEMENT & SAT II SUBJECT TESTS FOR FRENCH, GERMAN, ITALIAN, AND SPANISH

SAT-II Subject Test Score	Advanced Placement Test Score	Credits (Courses)	Placement Level
French and French with listening			
790–800	**5**	**6** (20201-20202)	**30310** or 30320
690–780	**4**	**6** (20201-20202)	**20300** or 20600
590–680	**3**	**7** (10102-20201)	**20202**
490–580	**2**	**8** (10101–10102)	**20201** or 20215
480	**1**	**4** (10101)	**10102** or 10115* or 10110*
German and German with listening			
790–800	**5**	**7** (10102-20201)	**20202** or 30000+
690–780	**4**	**8** (10101-10102)	**20201**
570–680	**3**	**4** (10101)	**10102**
Italian and Italian with listening			
790–800	**5**	**6** (20201-20202)	**30310**
690–780	**4**	**7** (10102-20201)	**20202**
590–680	**3**	**8** (10101-10102)	**20201** or 20215
490–580	**2**	**4** (10101)	**10102**
Spanish and Spanish with listening			
800	**5** (lang.)/4 (lit.)	**6** (20201-20202)	**30310** or 30320
690–790	**4** (lang.)/3 (lit.)	**6** (20201-20202)	**20600**
570–680	**3** (lang.)/2 (lit.)	**7** (10102-20201)	**20202**
460–560	**2** (lang.)/1 (lit.)	**8** (10101-10102)	**20201** or 20215
450	**1** (lang.)	**4** (10101)	**10102** or 10115* or 10110*

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

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INTERNATIONAL BACCALAUREATE—NOTRE DAME CREDIT

IB Higher Level Exam	Grade Required	Number of Credits Awarded	Notre Dame Equivalent Course	Notre Dame Exam Course Credited (if different)
Biology	6	6	**Biological Sciences** 10101 and 10107	**Biological Sciences** 10091 and 10097
Biology	7	8	**Biological Sciences** 10161/ 11161 and 10162/11162	**Biological Sciences** 10098 and 10099
Chemistry	6	3	**Chemistry** 10101	**Chemistry** 10091
Chemistry	7	4	**Chemistry** 10171	**Chemistry** 10097
Economics	6	6	**Economics** 10010 and 10020	**Economics** 10091 and 10092
English	6	3	**Writing and Rhetoric** 13100	
Foreign Languages				
Arabic	6	10	**Arabic** 10001-10002	
Chinese	6	5	**Chinese** 10111	
French	6	8	**French** 10101-10102	
German	6	8	**German** 10101-10102	
Greek	6	8	**Greek** 10001-10002	
Italian	6	8	**Italian** 10101-10102	
Japanese	6	5	**Japanese** 10111	
Latin	6	8	**Latin** 10001-10002	
Russian	6	8	**Russian** 10101-10102	
Spanish	6	8	**Spanish** 10101-10102	
History of the Americas	6	3	**History** 10010	**History** 10091
IB Math Analysis and Approaches	7	4	**Mathematics** 10550	**Mathematics** 10091
IB Math Applications and Interpretations	7	7	**Mathematics** 10120 and 10150	**Mathematics** 10088 and 10089
Physics	6	6	**Physics** 10111 and 10222	**Physics** 10091 and 10092
Physics	7	8	**Physics** 10310 and 10320	**Physics** 10093 and 10094
Psychology	6	3	**Psychology** 10000	**Psychology** 10091
Social and Cultural Anthropology	6	3	**Anthropology** 10109	

NOTRE DAME EXAMS COURSE CREDIT

Notre Dame Course	Course Title	Notre Dame Exam Course Credited	Qualifying Score
ACMS 10140	**Elements** of Statistics	**ACMS** 10091	80%
MATH 10250	**Elements** of Calculus I	**MATH** 10090	80%
MATH 10550	**Calculus** I	**MATH** 10091	80%
MATH 10560	**Calculus** II	**MATH** 10092	80%
MATH 20550	**Calculus** III	**MATH** 10093	80%
MATH 20580	**Introduction** to Linear Algebra and Differential Equations	**MATH** 10094	80%

School of Architecture

Francis and Kathleen Rooney Dean of the School of Architecture:
Stefanos Polyzoides
Associate Dean for Faculty Affairs and Curriculum:
Samir Younés
Associate Dean for Research, Scholarship & Creative Work:
Ming Hu
Assistant Dean and Academic Director/Rome Studies:
Selena Anders
Assistant Dean for Graduate Studies:
Richard Economakis
Director of the Michael Christopher Duda Center for Preservation, Resilience, and Sustainability:
Paul Kapp
Professors:
Philip Bess (retired); Richard Economakis; Sean Nohelty; Stefanos Polyzoides; Steven Semes; Duncan Stroik; Samir Younés
Associate Professors:
Ming Hu; Paul Kapp; Krupali Krusche; Alessandro Pierattini; Marie Soundy Escobar
Assistant Professors:
Xu Han; Mari Yoko Hara
Professors of the Practice:
Robert Brandt; Marianne Cusato; Alan DeFrees (retired); Ettore Mazzola; John Mellor; Michael Mesko
Associate Professors of the Practice:
Douglas Duany; Stephen Hartley; Julio Cesar Perez-Hernandez; Paolo Vitti; Jonathan Weatherill
Associate Teaching Professors:
Selena Anders; Giuseppe Mazzone; Christopher Miller; Lucien Steil
Concurrent Associate Professor:
Luis Fargier Gabaldon
Concurrent Teaching Professor:
Brian Smith
Concurrent Associate Teaching Professor:
Kevin Walsh
Adjunct Professors:
Thomas Albrecht; Jean-François Lejeune; Richard Piccolo
Adjunct Professors of the Practice:
Tiffany Abernathy; Craig Brandt; Stephen Kromkowski; Nikolas Vakalis
Adjunct Associate Professors of the Practice:
Lorenzo Fei; Stefano Fera
Adjunct Assistant Professors of the Practice:
Nicholas Rolinski; Charles Shafer; Todd Zeiger
Adjunct Assistant Teaching Professors:
Andrea Avelar Tuchan; Sara Bega; Kai Hu; Sam Lima
Visiting Professor:
Markus Tubbesing
Visiting Assistant Professor:
Cailin Nikel-Zueger
Teaching Scholar:
Nikolai Grigorevskii
Postdoctoral Research Associate:
Michelle Lynch-Koycu

Programs of Studies. The study of architecture has a long and distinguished history at the University of Notre Dame. Courses in architecture were taught at the University as early as 1869. Formal instruction in architecture began in 1898. The Department of Architecture, previously part of the College of Engineering, became the free-standing School of Architecture in 1994. The School offers a five-year program leading to the degree of Bachelor of Architecture, a two-year program leading to the degree of Master of Architectural Design and Urbanism, and two- and three-year programs leading to the degree of Master of Architecture. The professional degree programs (B.Arch. and M.Arch.) are accredited by the National Architectural Accrediting Board, and the curricula conform to NAAB requirements for the professional degree in architecture.

While the primary objective of the curriculum is professional education, students have opportunities to explore fields such as business, engineering, environmental sciences, and the liberal arts through electives and building on University requirements.

In the spring of 2024 the School of Architecture completed its most recent NAAB accreditation evaluation and was granted a full 8-year term of accreditation. The next accreditation visit of all programs will be in 2032.

Since the early 1990s, the School's curriculum has been based on education in traditional and classical architecture and urbanism. Instruction teaches the skills, cultivates the talents, and imparts the knowledge necessary to produce buildings that represent innovation within long-standing traditions, use nature's materials responsibly, and contribute to building livable communities. The School believes this is best done by learning how recurring problems in designing and constructing buildings and fitting them into existing urban and rural settings have been addressed in the past and adapting those lessons to the ever-changing circumstances of the modern world.

The goals of the curriculum include developing competence in the design of individual buildings, understanding the relationship between individual buildings and their physical and cultural contexts, and recognizing the ethical dimensions of the professional practice of architecture. Architects play a primary role in shaping the built environment and have a professional responsibility to do so in a manner that contributes to the civil life of society. Their work must also help to renew and sustain the integrity of the natural world and promote social welfare.

In addition to the five-year undergraduate professional degree of Bachelor of Architecture (B.Arch.), the School of Architecture offers multiple paths of study leading to one of three masters degrees.

The two-year post-professional graduate course of study leads to the Master of Architectural Design and Urbanism (MADU) degree, and is for those who already hold a professional degree in architecture (B.Arch. or M.Arch.).

The two-year professional graduate course of study leads to the Master of Architecture (M.Arch.) degree, and is for those who hold a four-year pre-professional degree (B.S. or B.A. in Architecture).

The three-year professional graduate course of study leads to the Master of Architecture (M.Arch.) degree, and is for those who hold an accredited undergraduate degree in a field other than architecture.

The Master of Science in Historic Preservation (MSHP) program prepares architects to manage the care of historic places. The curriculum prepares students to observe, analyze, and reinforce the identity of historic buildings and sites; understand and correctly apply conservation principles; acquire the necessary technical skills to conserve historic places for the long term; design new construction in harmony with historic places; and address climate change and other challenges emerging from the natural and man-made environment. The MSHP program is open to recent graduates and working professionals with professional or non-professional degrees in architecture.

All of these graduate courses of study entail one or three foundational studio courses, a one-year advanced study of architecture and urban design including one semester in Rome, and conclude with a one-semester thesis project.

Concentrations in furniture design, in historic preservation, and in architectural practice and enterprise, are options within the undergraduate degree program. Concentrations are declared at the end of the third year.

Required courses for the concentration in furniture design are Beginning Furniture, Advanced Furniture, Special Projects in Furniture I, and Special Studies in Furniture Design II.

The concentration in historic preservation requires four courses: Research and Documentation of Historical Buildings, History of American Architecture (1630–1915), Historic Preservation and Traditional Construction, and History and Theory of Preservation.

Students in the concentration in practice and enterprise take four courses from the Mendoza College of

Business: Accountancy I, Principles of Management, and two other courses chosen from offerings in various aspects of business.

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

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

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

Students are in contact with practicing professionals through collaboration between the School of Architecture and the Northern Indiana Chapter of the American Institute of Architects. The School of Architecture has an active chapter of the American Institute of Architecture Students.

Accreditation
In the United States, most registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit professional degree programs in architecture offered by institutions with U.S. regional accreditation, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted an eight-year, three-year, or two-year term of accreditation, depending on the extent of its conformance with established educational standards.

Doctor of Architecture and Master of Architecture degree programs may require a preprofessional undergraduate degree in architecture for admission. However, the preprofessional degree is not, by itself, recognized as an accredited degree.

The University of Notre Dame School of Architecture offers the following NAAB-accredited degree programs:

B.Arch. (165 undergraduate credits)
M.Arch. (preprofessional degree + 54 graduate credits)
M.Arch. (non-preprofessional degree + 93 credits)

Next accreditation visit for all programs: 2032

Research
School of Architecture faculty are actively engaged in research, practice, and creative work. Key research priorities include Urban and Placemaking; Climate Resilience, Environmental Justice, and Health; Time-tested and Emerging Technologies; and Architecture, Design and Preservation

Additionally, the School is home to the following faculty-led research labs, many of which provide research assistant opportunities to students: Digital Historical Architectural Research and Material Analysis Lab (DHARMA); Built Environment Decarbonization Analysis Lab (BEDA) and Historic Urban Environments Lab (HUE-ND). For the most up-to-date research news, visit the School of Architecture's website at https://architecture.nd.edu/.

Facilities
From its first quarters on the uppermost floor of the Main Building, Architecture has progressed to ever more sophisticated facilities. From 1964 to 2018 it was housed in the former Lemonier Library, extensively renovated in 1994 as Bond Hall of Architecture. In January of 2019 the School inaugurated Walsh Family Hall of Architecture. Located next to the Marie DeBartolo Center for the Performing Arts near O'Neill Hall of Music, the Raclin Murphy Museum of Art, and an anticipated facility for Art, Art History and Design, Walsh Family Hall is part of the developing "Arts District." It is a 100,000 square foot facility featuring classrooms, studios, an auditorium, library, digital design lab, and furniture workshop, in addition to a Hall of Casts and public plaza. In Rome, Architecture began with modest basement studio space but soon moved to a building in Renaissance Rome. In 2014, having outgrown that space, the program was moved to a facility one street from the Colosseum, as part of the newly established Rome Global Gateway which includes Architecture and other scholarly disciplines in Rome.

The Michael Christopher Duda Center for Historic Preservation, Resilience, and Sustainability.
The Michael Christopher Duda Center for Historic Preservation, Resilience, and Sustainability provides resources in support of the graduate degree program for the Master of Science in Historic Preservation, as well as for a vibrant research and outreach program, including support for individual scholarship, student studio travel for projects based beyond campus and the Rome Global Gateway, charrettes, exhibitions, conferences, and publications. The Center will also house interdisciplinary efforts that engage scholars and practitioners elsewhere in the University and in the wider academic and professional community. In this way, the Center further infuses the Architecture program with the principles of sustainability and resilience which are key to Notre Dame's mission to be a force for good in the world.

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

UNDERGRADUATE CURRICULUM

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

Course	*Credit Hours*
First Semester	
Writing I: University Seminar	3
Philosophy I: Introductory	3
Liberal Arts I: Principles of Physics I	3
Theology I: Foundational	3
ARCH 11011: Graphics I - Drawing	3
Moreau First Year Seminar	1
Total credits	16
Second Semester	
Writing 2: Writing & Rhetoric	3
Liberal Arts 2: Physics of Civilization	3
Liberal Arts 3: Mathematics in Architecture	3
ARCH 10211: Global History of Architecture	3
ARCH 11021: Graphics II - Drafting	4
Total Credits	16

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

Third Semester	
ARCH 21111: Design I	6
ARCH 20411: Building Technology I	3
ARCH 20211: Architectural History I	3
ARCH 21011: Intro to Architecture I	3
Liberal Arts 6 (WKSS or WKLC)	3
Total credits	18

Fourth Semester

ARCH 21121: Design II	6
ARCH 20221: Architectural History II	3
ARCH20511: Structural Mechanics	3
ARCH 20111: Intro to Architecture II	3
Philosophy 2 or Catholicism and the Disciplines	3
Total credits	18

Fifth Semester (Rome)

ARCH 34112: Design III	6
ARCH 34312: Architectural History III	3
ARCH 34012: Graphics III - Freehand Drawing	3
ROIT XXXXX: Conversational Italian *(number and title to be finalized)*	4
Total credits	16

Sixth Semester (Rome)

ARCH 34122: Design IV	6
ARCH 34322: Architectural History IV	3
ARCH 34311: Roman Urbanism & Architecture	3
ARCH 34022: Graphics IV - Watercolor	3
Total credits	15

Seventh Semester

ARCH 41111: Design V	6
ARCH 40511: Structural Design for Architects	3
ARCH 41011: Graphics V - Computers	3
ARCH 40411: Environmental Systems I	3
Concentration or elective	3
Total credits	18

Eighth Semester

ARCH 41121: Design VI	6
ARCH 40521 Applied Structural Systems	3
ARCH 40421: Building Technology II	3
Concentration or elective	3
Elective	3
Total credits	18

Ninth Semester

ARCH 51111: Design VII	6
ARCH 50419: Environmental Systems II	3
Theology 2: Developmental	3
Concentration or elective	3
Total credits	15

Tenth Semester

ARCH 51121: Design VIII (Thesis)	6
ARCH 50711: Professional Practice	3
Concentration or elective	3
Elective	3
Moreau Senior Capstone	1
Total credits	16

Notes:

- *Courses in Calculus or Physics strengthen preparation for structures courses. Students who enter the University with test credit equivalent to these courses should work with their advisors to identify appropriate coursework in calculus, physics, or environmental issues that will fulfill the Quantitative Reasoning and Science and Technology core requirements.*
- *The four required courses in Architectural History do not count as University core requirement history courses but do fulfill the "Arts & Literature or Language & Culture" requirement.*
- *From the group of History or Social Science or "Integration" course requirements, students must take two of the three, e.g.: An Architecture student with a history minor can count only one History course toward the core, and must take either Social Science or an "Integration" course.*

Total for five years: 165 semester hours.

COURSE DESCRIPTIONS

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

Student Awards and Prizes

AIA Medal for Academic Excellence. This American Institute of Architecture (AIA) award honors the graduating Bachelor of Architecture and Master of Architecture student who has the highest grade-point average for the complete course of study.

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

Alliance Architects Scholarship. Selected by the faculty, the Alliance Architects Scholarship is awarded to a student who has shown a personal or professional interest in serving or otherwise supporting under-represented minority communities, as evidenced by active membership in either the University's chapter of the National Organization of Minority Architecture Students (NOMAS-ND), in which all students are eligible to participate regardless of race or ethnicity, or the University's Student Association for Women in Architecture (SAWA-ND), which is open to all students regardless of sex.

Alpha Rho Chi. Selected by faculty, the Alpha Rho Chi Medal goes to the graduating student who has shown exceptional ability for leadership and has performed willing service for the School.

Andrew F. Kervick Award for Design and Drawing. Founded by Prof. Francis W. Kervick, former head of the School of Architecture in memory of his father, this award, selected by the fourth- and fifth-year faculty, honors the student whose work in freehand drawing in the fourth or fifth year has been of the highest merit.

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

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

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

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

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

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

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

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

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

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

Liang Ssu-Ch'eng Award. Selected by the fifth-year thesis jurors and the dean, this award recognizes excellence in non-Western architecture.

Lois E. Nichols Prize. Established in 2025, the prize celebrates, promotes, and advances the craft of architectural hand-draftsmanship as foundational to the education of the Architect. It is awarded to a graduating student whose culminating work embodies the highest ideals and skills as exemplified in a singular hand-crafted plate in the Ecole des Beaux-Arts tradition.

Michael and Julie Hanahan Architecture Prize. Selected by the students, this prize recognizes overall excellence in the study of architecture.

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

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

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

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

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

Robert Amico Studio Award. Selected by the dean and faculty for design excellence in the fourth or fifth year of study.

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

Ruiz Award for Excellence in Accessibility Design. Awarded to a rising fifth-year student to recognize their inclusion of accessibility issues in their studio work. Their work is well designed, demonstrates an awareness of ADA, and goes above and beyond the minimum design standard.

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

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

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

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

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

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

Student Organizations

The American Institute of Architecture Students. – Notre Dame Chapter (AIAS-ND). The American Institute for Architecture Students chapter at the University of Notre Dame enlivens the educational and social life of Walsh Family Hall of Architecture. AIAS-ND enhances the educational process by scheduling visits to active construction sites on campus with the cooperation of the University Architect and inviting guest speakers from nearby AIA chapters. In addition to these educational aspects, the club sponsors trips to national and regional events. The goal of AIAS-ND is to spur conversation, curiosity, and passion in this chosen field of study.

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

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

Stoa Magazine. Stoa—the student-led, student-designed, and student-edited magazine of the University of Notre Dame School of Architecture—serves as a platform for showcasing student experiences, design research, and writing. By bringing the unique Notre Dame student perspective to broad architectural themes, Stoa acts as a catalyst for mindful exposition and theory for contributors and readers alike. Above all, the magazine cultivates a community for intellectual growth by connecting students, alumni, and faculty, as well as fostering a dialogue with the wider academic and architectural world.

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

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

Students for New Urbanism – Notre Dame Chapter (SNU-ND). Students for New Urbanism (SNU-ND) provides education on the New Urbanist planning approach. The chapter also supports New Urbanism initiatives in the local community. The club also supports student participation in city forums related to downtown revitalization projects including the St. Joseph County Public Library renovation and the South Bend Riverfront redesign. Every year, the club brings planners, architects, and real-estate personnel to give lectures and engage in discussion with the Notre Dame students and faculty to encourage thought and enthusiasm for traditional city-planning.

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

Advisory Council

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College of Arts and Letters

The College of Arts and Letters is the oldest, and traditionally the largest, of the four undergraduate colleges of the University of Notre Dame. It houses 20 departments and several programs through which students at both undergraduate and graduate levels pursue the study of the fine arts, the humanities and the social sciences.

Liberal Education. The College of Arts and Letters provides a contemporary version of a traditional liberal arts education. In Arts and Letters, students have the opportunity to understand themselves as heirs of a rich intellectual and spiritual tradition and as members of a complex national and international society. The faculty of the college are committed to the life of the mind, to the critical and constructive engagement with the whole of human experience. On the basis of a firm yet broad foundation, graduates of the college are equipped for a lifetime of learning in an ever-changing world. The overall curriculum and the specific major programs encourage students to approach issues reflectively, to analyze them carefully, and to express their reasoned conclusions with clarity. The intellectual quest conducted in Arts and Letters takes place in an explicitly Catholic environment. Here ultimate questions of the meaning and value of human life before God are welcome, and efforts to deal with such questions utilize the immense resources of the Catholic tradition. Inquiry and faith are seen not as opposing forces but as complementary elements of the fully human pursuit of truth.

Organization. The College's undergraduate administrative center is the Office for Undergraduate Studies, located in 104 O'Shaughnessy Hall. All undergraduates in Arts and Letters are invited to consult with the assistant deans regarding questions about their academic progress, educational and career goals, and any other concerns of an academic or administrative nature. Pre-health and pre-graduate school advising is available in this office. In particular, sophomores in the college who have not yet declared a major should seek academic advising in this office. Because education is not limited to the classroom, the college also sponsors and encourages events which are intended to enrich the undergraduate experience and facilitate faculty-student interaction both on and off campus.

DEGREE REQUIREMENTS FOR THE COLLEGE OF ARTS AND LETTERS

The College of Arts and Letters offers curricula leading to the degree of the bachelor of arts and the bachelor of fine arts. Students in the College are required to complete 122 degree-countable credits, all University and College requirements, and the requirements for one major. The programs offered by the College of Arts and Letters include majors, supplementary majors, and minors. Every student in the college must complete one major. Supplementary majors and minors are optional and may be taken to supplement or enhance a student's major but do not lead to graduation in and of themselves.

ARTS AND LETTERS PROGRAMS

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

The major in liberals arts programs are normally declared in the sophomore year and is completed in the junior and senior years. Each semester before registration, the students are encouraged to seek advising from their undergraduate dean in the College as well as from the Director of Undergraduate Studies in their major(s). Majors include:

Art, Art History, and Design
Art History
Art Studio
Design
Classics:
- Arabic
- Classics
- Greek
- Latin
- Greek and Roman Civilization

Computer Science
East Asian Languages & Cultures:
- Chinese
- Japanese

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

English
Film, Television, and Theatre
Gender Studies
German, Slavic, and Eurasian Studies:
- German
- Russian

History
Mathematics (honors only)
Medieval Studies
Music
Neuroscience and Behavior
Philosophy
Philosophy and Theology
Political Science
Program of Liberal Studies
Psychology
Romance Languages and Literatures
- French and Francophone Studies
- Italian
- Romance Languages and Literatures
- Spanish

Sociology
Theology

Supplementary Majors. Supplementary majors typically require fewer courses than majors. They cannot stand alone in qualifying a student for an undergraduate degree but must be taken in conjunction with a primary major. They include both interdisciplinary and departmental offerings as follows:

Africana Studies (24 hours)
Arts and Letters Pre-Health (49 hours)
Art History (24 hours)
Asian Studies (24 hours)
Chinese (24 hours)
Classics (24 hours)
Education, Schooling, and Society (24 hours)
French and Francophone (24 hours)
Gender Studies (24 hours)
Greek and Roman Civilization (24 hours)
Italian (24 hours)
Japanese (24 hours)
Latino Studies (24 hours)
Medieval Studies (24 hours)
Russian (24 hours)
Spanish (24 hours)
Theology (25 hours)

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

Departmental Minors
Africana Studies
Anthropology
Art History
Business Economics
Chinese

Classics
- Classical Studies: Civilization
- Classical Studies: Heritage
- Middle Eastern and North African Studies

Collaborative Innovation
French and Francophone
Gender Studies
German
German Studies
Greek
Health, Humanities, and Society
History
- History
- Economic and Business History

Irish Language and Literature
Irish Studies
Italian
Japanese
Korean
Latin
Music
Philosophy
Portuguese and Brazilian Studies
Russian
Russian Studies
Slavic and Eurasian Studies
Sociology
- Sociology
- Data Science

Studio Art
Theatre
Theology

Interdisciplinary Minors
Catholic Social Tradition
Computing & Digital Technology
Constitutional Studies
Education, Schooling, and Society
Hesburgh Program in Public Service
International Security Studies
Journalism, Ethics, and Democracy
Latino Studies
Linguistics
Liturgical Music Ministry
Medieval Studies
Musical Theatre
Philosophy, Politics, and Economics
Philosophy, Religion, and Literature
Philosophy, Science, and Mathematics
Science, Technology, and Values
Sport, Media, and Culture

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

College and University Requirements

In contrast to major requirements, College and University requirements expose students to a broad range of fundamental courses in multiple disciplines or "ways of knowing" deemed essential for a liberal arts education within the context of a Catholic university. Exposure to these disciplines is normally defined as taking a limited number of courses (typically one or two) within that field or way of knowing.

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

Multi-Counting. The College offers a generous multi-counting policy. University Seminars (USEM) and Writing Intensive courses (WRIT) may fulfill the USEM and WRIT requirements and another requirement of the University core. For example, an upper-level ENGL course that has the WRIT and WKAL attributes may count for WRIT, LA4 or LA6, College LIT, and the ENGL major.

Cross-Counting. Students may cross-count a single course to satisfy two requirements in two different programs that require the same or similar courses. This course must be replaced by another course in one of the programs ("Waive and Replace.") For example, a student majoring in two disciplines that require statistics would need (with departmental approval) to take only one such course for the two majors. However, the student must take an additional course within one of the majors for the waived-and-replaced course, such that each major will always comprise at least ten unique courses (or 30 credit hours) in accordance with major requirements. The same applies for minors: if a course is waived-and-replaced in a minor, it is expected that the minor will nevertheless consist of a minimum of five unique courses (15 credits) with another appropriate course replacing the waived-and-replaced course. In each case, however, courses may still multi-count between University and College requirements.

Credit Exclusions. Students may not count both examination and degree credit for the same course toward graduation hours. For example, a student who has advanced placement credit for ROSP 20201 may not take ROSP 20201 and count both toward the 122 hours required in Arts and Letters. Students also may not count for degree credit both of two equivalent courses taught at Notre Dame. For example, PHIL 10101 and 20201 are considered to be equivalent courses, as are ECON 10010 and 20010. Students should take only one of each pair but not both. In cases where a student has double credit for the same course, the credits for only one course will be counted for credit, despite the fact that credits for both will appear on the student's transcript. A list of equivalent math and science courses can be found at the end of the College of Science section of the *Bulletin*. The same rules about double credit apply to them.

SPECIAL COLLEGIATE REQUIREMENTS

Students in the College of Arts and Letters must fulfill the following specific requirements. University requirements are described under "University Requirements," in the front section of this *Bulletin*. Arts and Letters students are required to take one of each of the following courses, three of which may be double-counted, as appropriate, towards the University Core Requirements designated as Liberal Arts 4, Liberal Arts 5, and Liberal Arts 6:
- Literature
- Fine Arts
- History
- Social Science

Such courses must carry the relevant University attribute attesting to its ability to fulfill a requirement in one of those three core categories. The University Core describes one of the options in Liberal Arts as "Art & Literature" meaning one course that is either art or literature. Arts and Letters students must take both art (FNAR) and literature (LIT).

Additionally, students must fulfill the following signature requirements of the College of Arts and Letters:
- Foreign Language (1–4 courses)
- College Seminar

Foreign Language Requirement. The College recognizes that students come to Notre Dame with some foreign language competency, as this is usually a requirement for admission. The foreign language requirement may be satisfied through the study of any modern or classical language offered at the University through the fourth-semester level. This will normally be a minimum of 14 credit hours over four semesters. Students cannot be exempted from this requirement by placing at a higher level: all students must take at least one semester of a foreign language at or above the fourth-semester level. Such a requirement recognizes the importance of foreign languages and cultures in our increasingly global society. Students who enter the University from a high school program outside the United States where the language of instruction is other than English may be exempted from the foreign language requirement. Such students should petition the dean of the college (or the dean's designate) and may be subject to an oral interview and/or a written exam in the relevant language before the exemption is granted.

Students without Advanced Placement or SAT-II credit, but who come with some background in the

language they elect will be placed by examinations given during first-year orientation and prior to spring registration. Departmental placement exams are not credit-bearing. Students may receive up to 8 hours of credit based on their scores on the AP and SAT-II tests. If, for some reason, more than 8 hours of credit appear on the transcript, the credits beyond 8 will be non-counted and will be manually subtracted from the total number of degree credits counting for graduation.

College Seminar: The College Seminar is a unique one-semester course shared by all students earning a degree in the College of Arts and Letters. Typically taken in the sophomore year, the course offers students an introduction to the diversity and distinctive focus of arts and letters at the University of Notre Dame. Specific sections of the College Seminars vary in their topics and texts, but all feature an interdisciplinary approach, commitment to engaging important questions, employment of major works, and emphasis on the development of oral skills. Every College Seminar syllabus will include works that approach the topic from the perspective of each of the three divisions of the college: the arts, humanities, and social sciences. College Seminar fulfills the CSEM requirement and cannot fulfill any other requirement. Students with significant oral communication disabilities may petition to be exempted from the College Seminar requirement.

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

Arts and Letters Special Opportunities

Activity and Experiential Learning Courses. Three elective credits of the required 122 hours can be satisfied by one or more of the following activity courses:

Band (Marching and Concert)
Orchestra
Chorale
Glee Club
Liturgical Choir
Folk Choir
Music Lessons and Ensembles
Social Concerns Seminars

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

Pass-Fail. With permissions from the academic dean, juniors and seniors may take one elective on a pass-fail grading basis. The pass-fail option may not be used for courses within the disciplines of declared majors, supplementary majors, or minors, or courses used to satisfy University or College core requirements.

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

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

Combination Five-Year Program with the College of Engineering. In 1952, in cooperation with the College of Engineering of the University, the College of Arts and Letters instituted a five-year program that combined a liberal arts program with the requirements of the various engineering programs. Students who complete the combination program will earn two degrees: the degree of bachelor of arts and the degree of bachelor of science in the engineering major pursued. Dual degree students are eligible to join the Reilly Program in Engineering and Arts and Letters described at https://reilly.nd.edu/undergraduate/dual-degree/. Dual-degree declarations should ideally be made during the sophomore year. No declaration after the beginning of a student's junior year (sixth semester) will be allowed.

Study Abroad. In light of the College's focus on intercultural studies, Arts and Letters students are encouraged to participate in the University's study abroad programs. For students whose academic program needs cannot be met through existing Notre Dame programs, limited exceptions to allow a student to attend non-Notre Dame programs abroad will be made on an individual basis after extensive consultation among the students, their faculty advisors, and the deans.

Student Awards and Prizes

COLLEGIATE AWARD IN MODERN AND CLASSICAL LANGUAGES

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

AFRICANA STUDIES

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

AMERICAN STUDIES

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

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

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

The Professor James Withey Award for Notable Achievement in Writing—The Professor James Withey Award is given for notable achievement in writing. The department conducts a writing contest for seniors in honor of a legendary teacher of writing at Notre Dame. According to Thomas Stritch, professor emeritus and a former student of Withey, "Withey was the best teacher I ever saw in action. He was not a prophet, like Frank O'Malley or Joe Evans, and he would not let a coterie or cult develop around him. He taught as a charity, God's work, and while he had the strongest likes and dislikes I ever saw, he gave each student his money's worth." This award is available to an American Studies major.

ANTHROPOLOGY

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

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

The Father Patrick Gaffney Integrative Anthropology Paper Award—given to a student who has written a paper that crosses traditional boundaries and draws from a range of different areas of scholarship to develop a fuller understanding of being and becoming human.

James McKenna and Joanne Mack Promising Anthropology Major Award—awarded to a first- and second-year student with outstanding early performance in the major.

The Carolyn Nordstrom Professional Achievement Award—awarded to the student with outstanding performance in academic publication, presentation at professional meetings, grants, and fellowships.

ART, ART HISTORY, AND DESIGN

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

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

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

Mabel L. Mountain Memorial Art Award—awarded for excellence in studio art.

The Radwan and Allan Riley Prize in Design—awarded to a senior design major for excellence in his or her respective field.

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

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

Eugene M. Riley Prize in Photography—awarded to an undergraduate or graduate photography major for excellence in photography.

Father Anthony J. Lauck, C.S.C. Award—awarded to a senior BA for excellence in his or her respective field.

Judith A. Wrappe Memorial Award—awarded to an outstanding junior studio/design major. It is presented at the beginning of the student's senior year of study.

ARTS AND LETTERS PRE-HEALTH

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

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

ASIAN STUDIES

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

CLASSICS

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

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

EAST ASIAN LANGUAGES & CULTURES

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

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

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

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

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

ECONOMICS

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

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

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

ENGLISH

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

Eleanor Meehan Medal for Literary Merit—presented to the English major who submits the best original critical essay written for an English course.

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

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

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

FILM, TELEVISION, AND THEATRE

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

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

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

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

GENDER STUDIES

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

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

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

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

GERMAN, SLAVIC, AND EURASIAN STUDIES

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

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

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

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

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

HISTORY

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

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

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

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

IRISH LANGUAGES AND LITERATURE

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

IRISH STUDIES

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

JOHN J. REILLY CENTER

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

MEDIEVAL STUDIES

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

MUSIC

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

PHILOSOPHY

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

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

POLITICAL SCIENCE

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

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

The Guillermo O'Donnell Prize—for the best senior thesis in the field of comparative politics.

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

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

PROGRAM OF LIBERAL STUDIES

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

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

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

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

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

PSYCHOLOGY

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

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

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ROMANCE LANGUAGES AND LITERATURES

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

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

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

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

SOCIOLOGY

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

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

THEOLOGY

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

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

Service Awards

AMERICAN STUDIES

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

ECONOMICS

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

MUSIC

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

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

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

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

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

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

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

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

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

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

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

POLITICAL SCIENCE

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

ROMANCE LANGUAGES AND LITERATURES

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

The Mara Fox Award for Service to the Hispanic Community—awarded to a graduating senior who has performed outstanding service benefiting the Hispanic community.

William Richardson Award in Hispanic Culture for an African American Student—given to a graduating African American student who has shown an unusually strong interest in Hispanic culture through his or her active participation in campus and/or community projects or activities.

José Tito Sigenza Award for Service to Hispanic Youth—awarded to the senior who has studied Spanish at Notre Dame and contributed outstanding service to Hispanic youth.

Africana Studies

Chair:
Mark Sanders, Professor, English and Africana Studies

Faculty:
Paulinus Odozor, Professor, Theology and Africana Studies
(The Rev.) Hugh R. Page Jr., Inaugural Vice President for Institutional Transformation and Advisor to the President; Professor, Theology and Africana Studies
Dianne Pinderhughes, Rev. Edmund P. Joyce, C.S.C. Professor, Africana Studies and Political Science
Maria McKenna, Professor of the Practice, Africana Studies and Education, Schooling, and Society
Ernest Morrell, Professor, Africana Studies, English, and IEI; Coyle Professor of Literacy Education; Associate Dean, Arts & Letters
Mark Sanders, Professor, Africana Studies and English; Director, Race and Resilience Initiative
Scott Alves Barton, Assistant Professor, Africana Studies
Bernard Forjwuor, Assistant Professor, Africana Studies (concurrent Political Science)
Zachary Sell, Assistant Professor, Africana Studies
Allison Mitchell, Assistant Professor, American Studies and Africana Studies
Pyar Seth, Assistant Professor, Africana Studies
La Donna Folsgren, Associate Professor, Film, Television & Theatre and Africana Studies

Emeritus Faculty:
Stuart Greene, Africana Studies and English
Richard B. Pierce, John Cardinal O'Hara, C.S.C., Associate Professor, History and Africana Studies

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

Director of Undergraduate Studies:
BMaria McKenna, mmckenna@nd.edu

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

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

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

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

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

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

Major (30 credit hours)
Introduction to Africana Studies (3 credit hours)
Interdisciplinary Requirement (9 credit hours)
Students will choose one AFST course from each of the following disciplines: literature/fine arts, history, and social science.
Senior Project or *Senior Thesis* (6 credit hours)
Four elective AFST courses (12 credit hours)

Supplementary Major (24 credit hours)
Introduction to Africana Studies (3 credit hours)
Interdisciplinary Requirement (9 credit hours)
Students will choose one AFST course from each of the following disciplines: literature/fine arts, history, and social science.
Four elective AFST courses (12 credit hours)

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

COURSE DESCRIPTIONS

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

American Studies

Chair:
Annie Gilbert Coleman
Director of Undergraduate Studies:
Pete Cajka
Professors:
Kathleen Sprows Cummings; Jason Ruiz; Sophie White
Professors Emeriti:
Erika Doss; Benedict Giamo; Thomas J. Schlereth; Robert Schmuhl; Thomas Tweed; Robert Walls; Ronald Weber
Associate Professors:
Annie Gilbert Coleman; Perin Gurel; Korey Garibaldi; Anthony Petro
Assistant Professors:
Ashlee Bird; Laurel Daen; Jennifer Huynh, Allison Mitchell
Assistant Teaching Professors:
Peter Cajka; Katherine Walden
Adjunct Assistant Professor:
Jason Kelly
Concurrent Faculty:
Gail Bederman (History); Jon Coleman(History); Patrick Griffin (History); Sandra Gustafson (English); Darlene Hampton (AL); Cyraina Johnson-Roullier (English); Michael Kackman (FTT); Mary Celeste Kearney (FTT); Kate Marshall (English); Timothy Matovina (Theology); Terry McDonnell (Sociology); John McGreevy (History); Rebecca McKenna (History); Dianne Pinderhughes (History); Pamela Wojcik (Film, Television and Theatre).

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

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

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

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

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

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

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

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

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

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

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

Once accepted, students should confirm their plans with their primary advisor and be sure to register in the fall for the **Senior Thesis AMST 47909** (3 credit hours). This course is limited to thesis writers, will meet during a regular class time, and is required. It is designed to help students develop their thesis projects, conduct research, and think about how their work relates to the field of American Studies. Students will work closely with the instructor and their primary advisor, and less formally with a secondary reader of their choice. Students writing a thesis and thus enrolled in The Senior Thesis AMST 47909 have the option to take, as their tenth class required for the major, either a senior seminar or an additional "inside" 30000-level class. In the spring students will register for **Senior Thesis Writing AMST 47910** (3 credit hours). This course is independent work with the primary advisor; students will complete their research and writing, as well as plan and give presentations of their work. The final senior thesis project is due in early April.

Thesis writers are expected to fulfill all the requirements for the major and remain in good academic standing. Those who fail to show good progress or maintain a satisfactory GPA will be asked to abandon their thesis project. Theses will be evaluated by both the primary advisor and secondary reader. Students will present their projects to students and faculty in April at the departmental celebration of research; presentation at the Notre Dame Undergraduate Scholar's Conference is encouraged.

Every thesis will be honored at the departmental commencement event and recognized on the departmental website.

Departmental Honors. Completion of a senior thesis is a central requirement for earning departmental honors, but not the only one. Honors in American Studies will be conferred upon graduating seniors in three levels: highest honors, high honors, and honors, based on 1) the originality and significance of the student's senior thesis; 2) the excellence of the student's GPA in the major as of January senior year; and 3) the student's degree of engagement with the field of American Studies, as demonstrated by participation in relevant lectures, conferences, internships, grants and fellowships, conversations with scholars, and completion of additional advanced courses. All students receiving honors will be recognized at the departmental commencement ceremony. For more information see the departmental website or contact the Director of Undergraduate Studies.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***American Studies***
- ***Journalism, Ethics & Democracy***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Anthropology

Chair:
Lee T. Gettler
Edmund P. Joyce Professors of Anthropology:
Roberto A. DaMatta (emeritus); James J. McKenna (emeritus)
Professors:
Susan Blum; Catherine Bolten; Meredith S. Chesson; Lee T. Gettler; Ian Kuijt; Carolyn Nordstrom (emeritus); Irwin Press (emeritus); Mark R. Schurr; Vania Smith-Oka
Associate Professors:
Maurizio Albahari; Christopher Ball; Alex E. Chávez; Rev. Patrick D. Gaffney, C.S.C. (emeritus); Donna Glowacki; Joanne M. Mack (emeritus); Kenneth E. Moore (emeritus); Cara Ocobock; Susan G. Sheridan
Associate Professor of the Practice:
Eric Haanstad
Assistant Professors:
Kristine Joy Chua; Mark Golitko; Aaron Michka, C.S.C.; Luis Felipe R. Murillo; Sam Patterson; Aidan Seale-Feldman
Director of Graduate Studies
Meredith S. Chesson
Director of Undergraduate Studies
Eric Haanstad
Affiliated Faculty
Ann-Marie Conrado, Associate Professor, Art, Art History and Design; Diarmuid Ó Giolláin, Professor, Department of Irish Language and Literature; Maira Hayat, Assistant Professor of Environment and Peace Studies; David Hernandez, Associate Professor, Department of Classics; Carlos Jáuregui, Associate Professor, Romance Languages; Peter Jeffery, Professor, Department of Music; Julia Kowalski, Assistant Professor, Keough School of Global Affairs; Rahul Oka, Associate Research Professor, Anthropology and Keough School of Global Affairs; Matthew Ravosa, Professor, Department of Biological Sciences; Karen Richman, Professor of the Practice, Institute for Latino Studies; Todd Whitmore, Associate Professor, Department of Theology; Jared C. Katz, Associate Curator of the Americas and Africa

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

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

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

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

Writing-Intensive Requirements: All courses taught in the department include writing components, which are both informal and formal and vary by course level. These assignments may include

response papers, journals, in-class writing, analyses, field research, or research papers. Courses offered in anthropology develop both critical thinking skills and global awareness through written and other assignments. Every major is required to take an advanced theory seminar (ANTH 40400, Perspectives in Anthropological Analysis) where they develop analytical and synthetic skills through intensive writing assignments combined with class discussion. All of the optional Senior Thesis sections (ANTH 48900) are also writing intensive.

PROGRAMS

1. **The Major.** There are no prerequisites to the major. The major requires 30 credits, six of which must be in the sequence of fundamentals, including ANTH 20201 (Fundamentals of Biological Anthropology), ANTH 10202/20202 (Fundamentals of Archaeology), ANTH 10203/20203 (Fundamentals of Social and Cultural Anthropology), and ANTH 10204/20204 (Fundamentals of Linguistic Anthropology). In addition, majors must take ANTH 40400 (Perspectives in Anthropological Analysis), one methods course (3 credits), and 18 credits of electives. At least six credits of the electives must be at the 40000 level. It is recommended that students take the fundamentals by the end of their sophomore year, whereas ANTH 40400 is usually taken as a junior or senior.

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

3. **The Minor.** The minor requires 15 credit hours. There are no prerequisites. Students must take two of the four fundamentals, ANTH 20201, 20202, 20203, and 20204. In addition, students must take nine credits of electives.

4. **Business Anthropology Concentration.** This track follows the major including 9 credit hours of business anthropology electives (ANBA).

5. **Bio-Medical Anthropology Concentration.** This track follows the major including 9 credit hours of bio-medical anthropology electives (ANMD).

Courses taken for pass-fail credit will not satisfy requirements for the major, the honors track, or the minor.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found at classsearch.nd.edu. The scheduled classes for a given semester may be found by selecting the subject (ANTH) *Anthropology.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Art, Art History, and Design

Chair:
Jim Collins
Professors:
Rev. Austin Collins, C.S.C.; Heather Minor; Martina Lopez; Michael Schreffler; Scott Shim
Associate Professors:
Clinton Carlson; Ann-Marie Conrado; Jason Lahr; Rev. Martin Lam Nguyen, C.S.C.
Assistant Professors:
Jason Carley; Marius Hauknes; Sarah Edmands Martin; Rachel Patt; Tatiana Reinoza; James Rudolph; Rodrigo Lara Zendajas
Professor of the Practice:
Elyse Speaks
Associate Professors of the Practice:
Justin Barfield; Emily Beck
Assistant Professors of the Practice:
Emily Harris

Website: http://artdept.nd.edu/

The Department. The Department of Art, Art History, and Design at the University of Notre Dame, is a multidisciplinary department offering programs of study in studio art, art history, and design. The mission of the department is to provide students with intellectually informed, hands-on instruction in creative studies within the context of a liberal arts university. An active lecture and visiting artist series and the extensive collections of the Raclin Murphy Museum of Art strengthen and broaden the work in the classroom and studio. The South Bend and Chicago areas provide additional cultural activities and experiences.

The department has fourteen studio art and design faculty, and six art history faculty. Undergraduate students may pursue coursework leading to one of two degrees: the bachelor of arts (BA) in studio art, art history or design; or the bachelor of fine arts (BFA) in studio art or design. A minor in studio art, collaborative innovation or art history is also offered to those students who wish to add experience in visual art to their undergraduate studies.

The departmental office is located in Riley Hall along with all studio art facilities, classrooms, and studio faculty offices. The art history classrooms are on the first floor of O'Shaughnessy Hall and the art history faculty offices are in Decio Faculty Hall. The design classrooms, studios, and design faculty offices are located in West Lake Hall. Skilled teaching scholars and support facilities are available as appropriate for each medium that is offered. The Center for Creative Computing operates five specialized computing labs for studio and design work including a professional digital printing studio in Riley Hall.

Students with a degree in creative studies are uniquely competitive among job-seeking graduates today. It is well recognized that creative study fosters methods of scholarship and production that employers and research institutions alike find compelling. A creative person draws on innovative approaches to solve problems; is willing to take initiatives in the face of ambiguity and uncertainty; is able to accept critical feedback to revise or expand an idea; can successfully communicate the value of their approach to others; and has the ability to mobilize resources to realize their ideas in an original form. In short, creative study is essential to the educational preparation needed to compete in the complex world culture we work and live in today.

THE STUDIO ART AND DESIGN MAJOR AND MINOR IN STUDIO ART

Bachelor of Arts Degree in Studio Art and Design
The Bachelor of Arts degree program in art and design is defined as a general liberal arts degree. The BA degree is ideal for the student who desires a liberal education with a strong emphasis in art. Students enrolling in the BA degree program are required to complete a five-course core curriculum. These courses are Drawing I, 2D Foundations, 3D Foundations, and two art history courses. Students select a major and concentration for the BA degree. For the Studio Art major, students may choose to concentrate in Ceramics, Painting, Printmaking, Photography, or Sculpture. For the Design major, students may choose to concentrate in Visual Communication Design or Industrial Design. The BA degree consists of 36 hours in art and design, of which 27–30 are in studio/design and 6–9 in art history.

Bachelor of Arts with Honors in Studio Art
The BA with Honors consists of two additional 3-credit honors thesis courses taken in sequence, fall/spring of the senior year. It is a special two-semester course sequence designed for the most talented and motivated department majors who wish to develop a capstone project during their senior year. The BA with Honors consists of 39 hours in art, of which 30–33 are in studio and 6–9 in art history.

Bachelor of Arts, Professional Track in Design
With similar requirements to the general B.A. degree, the Bachelor of Arts–Professional Track in industrial design is a liberal arts degree comprised of 48 credit hours. The curriculum focuses on helping students build their portfolio in pursuit of a design position immediately after graduation.

Bachelor of Fine Arts Degree in Studio Art and Design
The BFA program in art and design is intended for the student who wishes to pursue a professional career in the visual arts. The program is organized into a four-year sequence of study that provides a solid understanding of art and art history. The student has an opportunity to explore a variety of curricular options and then chooses an intensive and professional major. For the Studio Art major, students may choose to concentrate in Ceramics, Painting, Printmaking, Photography, or Sculpture. For the Design major, students may choose to concentrate in Visual Communication Design, or Industrial Design. In addition to a primary

concentration, BFA students are encouraged to select a secondary area of interest to broaden their thinking and to enrich their creative study. BFA candidates share a close working relationship with the department's faculty who are active professional artists and designers. Intensive studio work is complemented by an academic education with strong art history and liberal arts component. The BFA degree consists of 66 credit hours in art, of which 54–57 are in studio/design and 9–12 in art history.

BFA Freshman and Sophomore Years
Students beginning in the program are required to complete a studio core curriculum during their first two years. Five of these courses are mandated: Drawing I, Figure Drawing or Advanced Visualization, 2D Foundations, 3D Foundations and Photography I. The remaining two studio courses are optional, based on the student's interest. This intensive curriculum establishes a base for the studio practices and principles for all visual art expression. At the end of the fourth semester, students who have earned a minimum 3.25 grade point average in their studio courses will be accepted as candidates for the BFA degree. Students who do not qualify are eligible for the BA degree.

BFA Junior and Senior Years
Students accepted into the BFA program begin a two-year primary concentration in one of the following areas: ceramics, visual communication design, industrial design, painting, photography, printmaking, or sculpture. The concentration requires 15 hours of study in a major concentration area during the last four semesters. Teaching in the major is highly individualized and stresses the creative development and preparation of the student for the professional world. In addition to pursuing a concentration, all BFA majors must enroll in the BFA Seminar and the Senior Thesis courses. The culmination of the BFA degree is the completion of a senior thesis. This two-semester senior project, directed by a faculty member, will be exhibited and approved by the faculty as a requirement for graduation.

MINOR IN STUDIO ART

The minor in studio art is intended for the student who wishes to add studio art experience to their undergraduate studies. Freshmen, Sophomores and Juniors are eligible to declare a minor in studio art, which requires 15 credit hours, or 5 courses in studio art. Before being able to declare a minor, a student must be enrolled in or have already taken one of the following: Drawing I, 2D Foundations, or 3D Foundations.

As with the major, students seeking the minor may elect either a general or focused course of study; that is, students may take the four studio courses selected from among any of the studio disciplines (ceramics, painting, photography, printmaking, sculpture) or they may take four studio courses from within a single discipline. Because the Department offers multiple entry-level courses, students are able to enter the program at a variety of points.

STUDIO ART AND DESIGN CONCENTRATIONS

Studio Art Concentration
The Studio Art major is designed both for the student artist and the student interested in art as a second major or minor. Courses are offered in painting and drawing, ceramics, photography and video, printmaking, and sculpture. The Studio Art major provides an excellent basis for continuing work in graduate school and pursuing art-related fields such as design, art criticism, teaching, museum and auction house work, art therapy, media and publishing, commercial photography, exhibition design, and advertising.

The Studio Art major provides students with an opportunity to develop the techniques, visual sensibility, and historical understanding necessary for working with various materials. The mission of the major is to provide students with intellectually informed, hands-on instruction in creative studies within the context of a liberal arts university. One of the inherent values of visual art is that by giving tangible form to the social, political, and private aspects of human existence, it makes visible the invisible; it provokes the expansion of intellectual boundaries, gives form to complex ideas, reveals deep but abstract emotions and extends our capacity to comprehend the lives of others. Each of the programs in our department offers a distinct means of confronting and understanding the important visual aspects of our wider engagement with and construction of the world.

Ceramics Concentration
Ceramics is a concentration emphasizing clay and glaze as the primary vehicles for expression. Traditional pottery, vessel making, and sculpture may be addressed through a variety of processes that include hand building, throwing, and casting. Students are encouraged to develop technical skills and a direction of their own choosing. In addition to traditional ceramic materials and processes, students will be encouraged to study and utilize other sculptural media, as well as become familiar with contemporary and historical source material that will inform their own directions in ceramics.

Painting Concentration
Painting, with its many traditions, is a medium put to an extraordinary diversity of contemporary uses. Capable of representing everything from the material to the intangible, painting continues to be a means for artists of vastly different interests to address their subjects in highly individual ways. The painting concentration at Notre Dame fosters the aesthetic, critical, and technical development of each student through a program of course work, independent study, and regular critiques. Emphasis is placed on being well-versed in contemporary critical issues, on articulating individual themes, and on developing the technical means to give visual form to thematic concerns.

Photography Concentration
Images are arguably the most important documents of the 21st century, operating at the intersection of communication, commerce and culture. The photography program educates students to be technically skilled, visually literate and creatively prepared for a world where photography, video and streaming media permeate our everyday experiences. Beginning with foundation work through senior thesis, courses are designed to inform students about photographic traditions while engaging them in the critical issues and methodologies of contemporary practice. The photography major prepares students for a career in visual media (including fine art, media communications or advertising), education or institutional professions at galleries, museums or auction houses.

Sculpture Concentration
Sculpture today encompasses diverse materials and contexts for the expression of ideas in space. Within this broad description, students are encouraged to develop the technical skills that will help them expand their ideas into thoughtful individual expression. We embrace a breadth of vision and experience, which will challenge the student to investigate and respond to contemporary issues through problem-solving. A full range of traditional and non-traditional media are available in specific courses and through individual mentoring. By blending required and elective courses and independent study, students can experience a curriculum that responds to their particular needs and direction.

Design
Design is the order of form and the control of function; it is what designers do. Humans are conditioned to make decisions on the basis of appearance and contextual input, accepting or rejecting information and material goods in response to a variety of visual cues. Effective, user-centered design can do more than attract interest or manipulate perception: it can enable people. Good design and careful planning can promote understanding, simplify use, improve safety, instill confidence, add value, and create community.

At Notre Dame, undergraduate design education begins with immersion into the liberal arts curriculum. This social, philosophical, critical, ethical, and historical experience helps build a foundation of cultural understanding that naturally informs the creative and problem-solving methods. Responsible designers, consequently, approach the development process with sensitivity for human need, human aspiration, and the functional requirements for both production and implementation. At its best, design serves the spectrum of needs from individuals to constituencies in industry, society and the global environment.

Though design has been part of the Notre Dame curriculum since the early 1950s, students enjoy the advantages of a campus that provides access to current technologies. Technically advanced collaborative

teaching spaces and digital labs support all student design activities, including an on-site 20-station 2D computer studio, a 16-station 3D computer studio, and a high performance digital imaging studio, all maintained by the services from Notre Dame's Center for Creative Computing. In addition, a model shop provides rapid prototyping capabilities ranging from traditional hand tools to precision computer controlled fabrication and 3D printing. Intermediate and advanced level undergraduate students share an energized design community with defined studio spaces located in close proximity to all design-related resources and facilities in the Design Center at West Lake Hall.

Visual Communication Design Concentration
At its most basic level, visual communication design is a creative process that combines the visual arts and technology to communicate ideas. In the hands of a talented designer, these ideas are transformed into visual communication that transcends mere words and pictures. By controlling color, type, movement, symbols, and images, the designer creates and manages the production of visuals designed to inform and persuade a specific audience. By combining aesthetic judgment with project management skills, designers develop visual solutions and communications strategies. The professional designer works with writers, editors, illustrators, photographers, code writers, and printers to complete compelling designs that effectively communicate a message.

At Notre Dame, the undergraduate visual communication design curriculum begins with a foundation in the liberal arts. Such a basis is a design student's best path to meet and solve the varied communication challenges inherent in today's complex world. Because a design solution may emerge from the humanities, an algorithm, or a scientific discovery, the curriculum provides a student with the opportunity to be firmly grounded in the fundamentals of design and the visual arts, while also taking courses in science, math, history, philosophy, and theology. As students progress through the tiered design program, they develop as a designer, as an intellectual, and as a moral person, prepared to address the social, ethical, and political circumstances influenced by the design profession.

At its core, the Notre Dame visual communication design program asserts that the designer can make a difference not only in the strategic plan of a business but also in the world. During their time on campus, students develop projects that aspire to positively influence the lives of culturally diverse people, critique the ethical dimensions of contemporary culture, and give visual form to complex social issues. As design professionals, Notre Dame graduates will be responsible for the future of our visual culture.

Industrial Design Concentration
Industrial designers give form to virtually all mass-manufactured products in our culture. They seek opportunity and advantage through identifying and solving problems. Their creative contributions impact the utility, appearance, and value of our tools and environment. Their most innovative solutions lie at an intersection of what is knowable and what is possible.

The industrial design profession demands excellent organizational skills, an awareness of visual and tactile aesthetics, human behavior, human proportion, material, process, and the responsible appropriation of resource, during and after use. Designers express conceptual proposals through a combination of well-developed drawing, physical modeling, computer modeling, writing, and verbal skills. Designers best serve the consumer through sensitive and innovative collaboration with art, science, engineering, anthropology, marketing, manufacturing, and ecology. Properly implemented, industrial design affords greater benefit, safety, and economy to all participants and recipients impacted by the product development cycle.

Notre Dame's Industrial Design Program (NDID) maintains student chapter affiliation with the Industrial Designers Society of America (IDSA). NDID interacts with regional, national, and international corporate design and consulting offices in the form of annual conferences, sponsored projects, field trips, and internships.

MINOR IN COLLABORATIVE INNOVATION

The Minor in Collaborative Innovation offers students a dynamic catalyst for process-based, cross-disciplinary collaboration and learning between various academic departments in Arts & Letters, and wider disciplinary interests across the university. The minor seeks to build a strong core competency in design thinking and collaborative innovation to meet the growing demand for this skill among these various communities, attracting broad and diverse student enrollment and re-establishing the primacy of a humanistic, collaborative approach to the complex problems and integrated challenges facing a rapidly changing world.

The minor offers a five-course sequence starting with *Design Matters,* a large, introductory, lecture-based design-thinking. Declared minors will then cycle through a series of four additional courses introducing students to the various skillsets implicated in design thinking including research methods, visualization, and entrepreneurship. The minor culminates in the capstone course *Collaborative Product Development,* bringing the minor's various disciplines (1st majors) together in fruitful collaboration with design majors to address industry sponsored projects addressing real world questions.

Fifteen credit hours are required for the completion of this minor. These include: 3 credits—DESN 20203 "Design Matters— Introduction to Design Thinking" (Students may not declare the minor until they are enrolled in or have completed this course), 3 credits—DESN 40201 "Collaborative Product Development" (capstone course required for all minors), 3 credits—DESN 30210 "Design Research Practices", and 6 credits—designated two course sequence in either ID or VCD.

THE ART HISTORY MAJOR

Notre Dame's art history major is designed to equip our students with a broad overview of the development of Western art and to provide them with an in-depth knowledge of particular periods, problems, and research methods. The diversity and scholarly strength of our faculty and the research facilities of the Hesburgh Library, including the Medieval Institute, are supplemented by the rich resource of the Snite Museum of Art. With a permanent collection of over 21,000 works, the Snite Museum not only gives our students an invaluable firsthand acquaintance with important examples from all periods and many cultures—including distinguished collections of old master drawings, 19th- and early-20th-century photographs, and Pre-Columbian art—but also provides a wide range of opportunities for our students to gain practical museum experience in both volunteer and paid positions.

The University of Notre Dame offers a 45-hour Art Conservation Track, a 33-hour Honors Program (11 courses), a 30-hour first major (10 courses), a 24-hour (8 courses) supplementary major in art history, and a 15-hour minor (5 courses). These degrees are intended not only for students who are already intent upon pursuing a career in an art museum or gallery or as a college or university professor, but also for those individuals who simply wish to learn more about Western civilization through the examination of some of its most beautiful, provocative, and informative objects.

DEPARTMENTAL HONORS IN ART HISTORY AND THE SENIOR THESIS

The Honors Program will consist of 33 hours, as compared to 30 hours in the regular first major. First majors with a grade point average of 3.667 or above in Art History courses may petition the faculty for permission to enter the Art History Honors Program contingent upon maintaining this GPA level and the successful completion of an Honors Thesis. The student who wishes to be considered for departmental honors must select a thesis advisor with whom the student has taken courses in the area of specialization for the thesis. The student must petition the faculty with a one-page letter by the 10th week of the spring semester of the student's junior year. The letter should be addressed to the Director of Undergraduate Studies for Art History. In the letter the student should give a brief indication of with whom and on what they are proposing to write her/his thesis and a brief account of her/his future plans. If the faculty approves, then in place of one of the elective art history courses or seminars the student will sign up for six credit hours of Honors Thesis credit, taking three hours in the fall semester of their senior year and three hours in the spring semester of their senior year.

Students who maintain the required 3.667 or higher GPA and successfully complete a senior thesis with a grade of A– or higher will earn Honors in Art History.

Art History First Major
Art history first majors are required to take one course at the 10000-level or 20000-level, one course at the 20000-level or higher, Research Methods & Theories (taken sophomore or junior year), three courses at the 30000-level or higher, two courses at the 40000-level or higher, and two elective courses at any level.

Art History Conservation Track
Students wishing to complete the conservation track are required to complete eight art history courses following the supplementary major coursework outlined below. It also includes two studio art courses, organic chemistry with a lab component, three science courses (with a lab component), and a one-credit capstone project or internship.

Art History Supplemental Major
SStudents wishing to complete a second major in art history are required to take one course at the 10000-level or 20000-level, one course at the 20000-level or higher, Research Methods & Theories (taken sophomore or junior year), three courses at the 30000-level or higher, and two courses at the 40000-level or higher.

Art History Minor
Students wishing to minor in art history can do so by taking one course at the 10000-level or 20000-level, one course at the 20000-level or higher, and three courses at the 30000-level or higher.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Art History***
- ***Art Studio***
- ***Design***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Classics

Chair:
Luca Grillo
Professors:
Luca Grillo; Li Guo (Arabic)
Associate Professors:
Hussein Abdulsater (Arabic); Christopher Baron; David Hernandez; Brian A. Krostenko; Elizabeth Forbis Mazurek; Hildegund Müller; Catherine M. Schlegel; Aldo Tagliabue
Concurrent Professors:
Felipe Fernández-Armesto; John Fitzgerald; Robin Jensen; Blake Leyerle; David O'Connor; Andrew Radde-Gallwitz; Gretchen Reydams-Schils; Ingrid Rowland; Christopher Shields
Concurrent Associate Professor:
David Gura
Assistant Professor:
Erynn Kim
Teaching Professors:
Ghada Bualuan (Arabic); Bert Lott; Tadeusz Mazurek
Assistant Teaching Professor:
Catherine Bronson (Arabic)

The department. The Department of Classics offers courses in the languages, literatures, archaeology, history, religions, and civilization of the ancient world. Cooperation with other departments of the college makes available to Classics students additional courses in the art, philosophy, and political theory of antiquity. Visit us online at classics.nd.edu.

The department also provides the administrative home for the Program in Arabic and Middle Eastern Studies.

MAJORS IN CLASSICS

Classics majors encounter at their sources the perennial cultures of Greece and Rome, cultures that continue to exercise a profound influence on Euro-American civilization. Classical training imparts enhanced skills in close reading and analysis of literary and rhetorical forms, as well as repeated experience of the integration of literature, history and ancillary studies. Thus, a major in Classics provides the archetypal humanistic education and an ideal preparation for entry into any of the professions that require mastery of language, close analysis of documents and integration of multiple details.

The lower-level courses equip the student with basic knowledge of languages and with a conspectus of ancient history and culture. Advanced courses in Latin and Greek literature and Ancient Civilization provide opportunities for more focused and detailed study and are conducted in a seminar format with emphasis on research and writing.

In addition to the other University requirements, students majoring in Classics will, under normal circumstances, complete at least 10 courses (30 credit hours) in one of two areas of concentration: Classics or Greek and Roman Civilization.

Classics Major

5 courses in Greek or Latin language/literature: 20003 and above*	15
2 courses in non-primary language (Greek or Latin)	6
1 course in Greek or Roman History	3
2 Classics courses in English translation (CLAS)	6
	30

*Students will typically choose one of the two classical languages, ancient Greek or Latin, in which to fulfill the language requirement at the advanced level. They will be required to take at least two semesters in the other language at the appropriate level. If students have sufficient background in both languages, it should be possible for them to complete the requirements of the major through a combination of intermediate and advanced courses in both languages, as long as the total number of language courses equals seven (21 credit hours) for the first major and five (15 credit hours) for the supplementary major.

Supplementary majors in Classics will be exempt from the two courses in the second classical language.

Greek and Roman Civilization Major

The History of Ancient Greece	3
The History of Ancient Rome	3
1 course in ancient archaeology	3
1 course in ancient literature	3
6 Classics courses in English translation (CLAS) or Greek and Latin language offerings*	18
	30

*Students are strongly encouraged, but not required, to include some language study in their six elective courses.

Supplementary majors in Greek and Roman Civilization are required to take only four elective classics (CLAS) courses in English translation or in Greek/Latin language.

MINORS IN CLASSICS

Minors provide students majoring in other areas with structure and certification for a variety of approaches to the study of Greek and Latin language, literature, and civilization.

Latin Minor
The Latin Minor provides a solid grounding in the philological and literary study of Latin texts of the classical period, or, for those who prefer, of Christian Latin literature. It consists ordinarily of five courses (15 hours) in intermediate or advanced Latin (CLLA 20003 and above). Students interested in later Latin texts are directed to the joint offerings of the department and the Medieval Institute.

Greek Minor
The Greek Minor provides a solid grounding in the philological and literary study of Greek texts of the classical and Hellenistic periods. It consists ordinarily of five courses (15 hours) in intermediate or advanced Greek (CLGR 20003 and above).

Minor in Classical Studies: Greek and Roman Civilization
The Classical Studies (Greek and Roman Civilization) minor focuses on the history and culture of the classical world. The minor consists of three required courses (one in Greek history, one in Roman history, one in ancient archaeology) and two electives from CLAS courses, whether offered by the department or cross-listed by other programs, or from Greek and Latin language courses, and may include classes in philosophy, art, architecture, political theory, literature or law, at the discretion of the Director of Undergraduate Studies.

Minor in Classical Studies: Classical Heritage
The Classical Studies (Classical Heritage) minor allows students to connect the study of classical antiquity with other disciplines and periods and especially to study the inheritance and transformation of the classical tradition in areas like patristics, philosophy, late antiquity, and later Western art and literature. The minor consists of five courses: one with a chiefly historical orientation; one with a chiefly literary orientation; and three others approved by the Director of Undergraduate Studies, which may be taken from inside or outside the department.

Minor in Middle East and North Africa
The Middle East and North Africa region has long occupied a contested space in public discourse as the site of fluid social, cultural, and political developments. There is a continued urgency for global citizens who are well-informed about the history, cultures, and politics of the region.

The Minor in Middle Eastern and North African (MENA) Studies will equip you with critical skills to approach the study of the region in a constructive and nuanced manner. Through the minor, you will explore the cultures of the Middle East and North Africa from various intellectual perspectives, using multidisciplinary tools such as textual criticism, historical studies, and strategic analysis.

Areas of exploration include:

- Religious traditions, as the Middle East is the birthplace of the three Abrahamic religions of Judaism, Christianity, and Islam
- Literary heritage, reflected in the region's vast body of literature and its numerous languages (Arabic, Farsi, Hebrew, Syriac, Turkish, Urdu, Berber, and more)
- Ancient history, spanning 5,000 years of civilization and including the oldest continuously inhabited cities of the world
- Economics and geopolitics, since the Middle East is home to the world's largest reserve of gas and oil

Notre Dame's advanced resources in Middle Eastern and North African Studies are designed to educate and equip the next generation of students with scholarly skills and policy acumen that will enable them to navigate future issues involving these regions in a constructive and nuanced manner.

The MENA Studies minor is open to any Notre Dame undergraduate student.

SENIOR THESIS/HONORS TRACK

Classics majors are admitted into the honors track by approval of the Director of Undergraduate Studies. To receive honors, a student must (1) complete all requirements for the major; (2) maintain a GPA of at least 3.65 in the major; (3) complete the Honors Seminar for the senior year; (4) and receive a grade of A– or higher for a 5,000–6,000 word honors thesis. Honors students work closely with a member of the Classics faculty, who guides their research project. For more information see http://classics.nd.edu/undergraduates/honors-and-research/.

Major in Arabic
A total of 36 credit hours distributed in the following areas:

6 courses in Arabic	24
1 course in literature, taught by the Arabic faculty	3
1 course in Middle East history, taught by the Arabic faculty	3
1 course in Islam, taught by the Arabic faculty	3
1 elective, subject to departmental approval	3
	36

Major in International Economics in Arabic
The new undergraduate major in International Economics in Arabic is a collaborative effort between the Department of Economics and the Classics Department. In pursuing this major, students take a minimum of eight economics courses and are also required to enroll in a one-credit "Exploring International Economics" course, preferably in their sophomore year, designed to foster the integration of the study of culture with the study of economics. Details about the requirements for this major can be found online at https://arabic.nd.edu/arabic/requirements/#International_Econ.

STUDY ABROAD

Our students are encouraged to study abroad for a semester, especially in the Mediterranean basin at Notre Dame's Rome Global Gateway. The Department also supports programs offered by the Intercollegiate Center for Classical Studies in Rome, College Year in Athens, through the Jerusalem Global Gateway, and in Arab-speaking countries. Credits earned for course work taken in approved programs can be used to fulfill our major and minor requirements. Studying abroad during the summer is also possible. Grants are available on a competitive basis for summer language study through the Center for the Study of Languages and Cultures and the Nanovic Institute for European Studies. For more information see classics.nd.edu/summer-programs/ or arabic.nd.edu/undergraduate-program/beyond-the-classroom/.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Classics in Translation***
- ***Greek Language and Literature***
- ***Latin Language and Literature***
- ***Arabic Language and Literature***
- ***Middle East Studies***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Computer Science

Program Director
William Theisen, Assistant Teaching Professor, Computer Science and Engineering

Program Website
altech.nd.edu

Faculty
The Bachelor of Arts in Computer Science is interdisciplinary by nature and benefits from the scholarly contributions of a large number of Notre Dame faculty representing an array of academic departments.

Program Overview
The Bachelor of Arts degree in Computer Science (BACS) is intended for students who desire a strong liberal arts program with a concentration in computer science. It is suitable for students who expect to apply the principles of computing in a discipline within the humanities, social sciences, or natural sciences, but are not necessarily seeking the specialization that is typically offered in a traditional engineering curriculum. The BACS degree program contains the fundamentals of computer science, including algorithms, structured programming, data structures, programming languages, and software engineering.

Graduates of the Bachelor of Arts in Computer Science will:

- Apply their education in computer science to pose questions in and derive solutions for humanistic, social, and scientific problems.
- Account for ethical and social concerns when solving humanistic, social, and scientific problems
- Develop knowledge in a secondary cognate area of their choosing.
- Function effectively in a collaborative team and effectively communicate with members of the team.
- Engage in continued education in their field of expertise.
- Attain positions of leadership in their chosen field.

Program Requirements
The BACS major requirements are listed below:

1. *Completion of University Core Curriculum requirements.* CSE 10001 may not be used to fulfill the University Science & Technology core requirement, due to its strong similarity in coverage to CSE 20311.

2, *Completion of College of Arts and Letters requirements.*

3. *Completion of Major-specific mathematics requirements:* MATH 10550, MATH 10560, and six or more credits of mathematics coursework from MATH 20550 (Calculus III), Math 20610 (Linear Algebra), MATH 20580 (Linear Algebra with Differential Equations), ACMS 30440 (Probability and Statistics), ACMS 30530 (Introduction to Probability). Petitions to accept other Math or ACMS courses for this requirement will be considered, but introductory mathematics courses will generally not be approved. Restrictions (e.g., credit cannot be granted for both MATH 20610 and MATH 20580) will apply. Students arriving with transfer credit in MATH 10550 and MATH 10560 must choose at least one math course that satisfies the Quantitative Reasoning requirement in the University Core Curriculum.

4. *Completion of Computer Science and Engineering coursework* (35 credits)

a. *23 hours of required courses:* CSE 20110: Discrete Mathematics, CSE 20311: Fundamentals of Computing, CSE 20312: Data Structures, CSE 20289: Systems Programming, CSE 30151: Theory of Computing, CSE 40113: Design and Analysis of Algorithms, CSE 40175: Ethical and Professional Issues

b. *12 hours (typically four courses) of CSE electives:* All electives must be taken at the 30000 level or higher, and all associated prerequisite requirements must be satisfied. Students are expected to make elective course selections in consultation with their academic advisor, reflecting their interests and, where possible, facilitating intellectual points of contact between computer science and the cognate area.

5. *Completion of Cognate area of study (15 or more credit hours):* A cognate area of study must be a major or minor in Arts and Letters (or an approved supplementary major or minor). Courses in the cognate area must embody an area of knowledge outside of the computing disciplines. The selected cognate area and its courses must be approved by the BACS program director or designee in consultation with the relevant department(s), using criteria intended to ensure depth of study in the cognate area. Students will be encouraged to explore the places of intellectual contact between the approved cognate area and CS. Arts and Letters minor programs of 15 credit hours or more will satisfy the cognate requirement, with the exception of the CDT and Data Science minor programs which are excluded because of disciplinary proximity. If a department offers a minor, any BACS cognate in that discipline should generally be the existing minor program. Arts and Letters major or supplementary major programs where sufficient coursework lies within Arts and Letters will also satisfy the cognate requirement. Arts and Letters supplementary minors will require coursework beyond the minor and Arts and Letters core to satisfy the cognate.

6. *Thesis:* Students are encouraged to develop and execute a senior thesis that explores a topic at the interface between computer science and the cognate area. The thesis should be developed by the student in consultation with one or more faculty mentors (ideally with expertise in CS and the cognate area) and must be crafted and delivered in accordance with the policies of the College of Arts and Letters.

Admission
Students may be admitted directly to the BACS degree upon admission to Notre Dame or students may apply to the BACS degree in the spring of their first year of study. All first-year students are eligible to apply. Applicants are competitively selected for a limited number of slots based on an essay or short video and first year performance. Further information about the application process can be found at the program website. Information about the Bachelor of Science in Computer Science can be found at cse.nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the appropriate subject (Computer Science, cognate area, etc.). Course descriptions can be found by clicking on the subject code and course number in the search results.

East Asian Languages & Cultures

Department Chair:
Xiaoshan Yang
Director of Undergraduate Studies:
Yongping Zhu
Professors:
Michael Hockx; Xiaoshan Yang
Professor Emeritus:
Liangyan Ge
Associate Professors:
Michael C. Brownstein; Lionel M. Jensen; Yongping Zhu
Assistant Professor:
Hayun Cho; Amanda Kennell; Xian Wang
Teaching Professors:
Noriko Hanabusa; Hana Kang; Chengxu Yin; Yeonhee Yoon
Associate Teaching Professor:
Jincheng Liu; Congcong Ma; Weibing Ye
Assistant Teaching Professors:
Naoki Fuse; Yoko Kawamura

Mission Statement: The peoples of East Asia comprise one quarter of the world's population and account for a similar proportion of the world's production and consumption. This, along with the contemporary fusion of Asia and the West politically and economically, makes knowledge of the diverse languages and cultures of East Asia vital to an understanding of our global community and indispensable for the preparation of careers in the Pacific Rim. The Department of East Asian Languages & Cultures provides the resources and instruction necessary for success in these areas. The department is dedicated to providing rigorous language training in Chinese, Japanese, and Korean, as well as courses taught in English on Chinese, Japanese, and Korean philosophy, religion, literature, and culture. Complementary courses in other disciplines are listed in this *Bulletin* under departments such as history, philosophy, theology, political science, economics, and anthropology.

Completion of the fourth semester of Chinese, Japanese, or Korean (Second Year Chinese II, Second Year Japanese II, Second Year Korean II) will satisfy the language requirement for both the College of Arts and Letters and the College of Science. Although the College of Business does not have a language requirement, it strongly supports integration of language courses into its curriculum and encourages students to participate in the study abroad programs (See "Study Abroad" under Mendoza College of Business).

Placement and Language Requirement. Students who wish to enroll in a Chinese, Japanese, or Korean language course beyond the 10111 or 10112 level must take a placement examination administered by the Department. Students testing out of 10xxx-level language courses must complete at least one course at the 20xxx level or higher to satisfy the language requirement.

PROGRAM IN CHINESE

The program in Chinese offers language classes in Mandarin Chinese at the first-, second-, third-, fourth-year and advanced levels and classical Chinese, as well as courses in English on classical and modern Chinese literature and culture. Qualified students also have the opportunity to attend East China Normal University in Shanghai; Peking University in Beijing, People's Republic of China; and Fu Jen University in Taipei, Taiwan.

The Chinese program offers first and supplementary majors and a minor.

Basic requirements: For the major, students must complete 30 credit hours, including third-year Chinese. For the supplementary major, students must complete 24 credit hours, including third-year Chinese. For the minor, students must complete 15 credit hours, including two semesters of language classes beyond the first-year. 10xxx-level language courses and University seminars on China-related topics do not count toward the major, supplementary major, or minor.

Other requirements: In addition to the language course requirements described above, all majors must take three upper-division 3-credit courses in Chinese literature and Chinese culture taught by EALC faculty, including at least one literature course. Any exception must be approved by the Director of Undergraduate Studies. Remaining credit hours may be satisfied by taking additional Chinese language and culture courses, or other East Asia-related courses approved by the Director of Undergraduate Studies.

THE HONORS TRACK IN CHINESE

Majors in Chinese are strongly encouraged to pursue the honors track. Those who are interested must meet the following criteria:

1. Fulfillment of all the requirements for a first major of 30 credit hours in Chinese;

2. A cumulative GPA of at least 3.3 and a GPA of at least 3.7 in the major, or permission from the department chair;

3. Completion of fourth-year Chinese.

Program Requirements: In addition to the 30 hours required for a major, the honors track requires the completion of a senior honors thesis that demonstrates the student's originality and ability to do research in the target field. For this endeavor, the student will receive 3 hours of graded credit. This means to graduate with departmental honors, the student must earn 33 hours of credit in the major.

Students are admitted into the honors track in the spring semester of their junior year. The senior honors thesis is a year-long, one-on-one experience with a faculty mentor that comprises two semester courses of 3 credit hours each.

PROGRAM IN JAPANESE

The program in Japanese offers language classes in modern Japanese at the first-, second-, third-, and fourth-year and advanced levels, as well as courses in English on classical and modern Japanese literature and culture. Qualified students also have the opportunity to attend Nanzan University in Nagoya, and Sophia University in Tokyo, Japan.

The Japanese program offers first and supplementary majors and a minor.

Basic requirements: For the major, students must complete 30 credit hours, including two semesters of third-year Japanese. For the supplementary major, students must complete 24 credit hours, including third-year Japanese. For the minor, students must complete 15 credit hours, including two semesters of language classes beyond the first year. 10xxx-level language courses and University seminars on Japan-related topics do not count toward the major, supplementary major, or minor.

Other requirements: In addition to the language course requirements described above, all majors must take three upper-division 3-credit courses in Japanese literature and Japanese culture taught by EALC faculty, including at least one literature course. Any exception must be approved by the Director of Undergraduate Studies.

THE HONORS TRACK IN JAPANESE

Majors in Japanese are strongly encouraged to pursue the honors track. Those who are interested must meet the following criteria:

1. Fulfillment of all the requirements for a first major of 30 credit hours in Japanese;

2. A cumulative GPA of at least 3.3 and a GPA of at least 3.7 in the major, or permission from the department chair;

3. Completion of fourth-year Japanese.

Program Requirements: In addition to the 30 hours required for a major, the honors track requires the completion of a senior honors thesis that demonstrates the student's originality and ability to do research in the target field. For this endeavor, the student will receive 3 hours of graded credit. This means to graduate with departmental honors, the student must earn 33 hours of credit in the major.

Students are admitted into the honors track in the spring semester of their junior year. The senior honors thesis is a year-long, one-on-one experience with a faculty mentor that comprises two semester courses of 3 credit hours each.

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MAJOR IN INTERNATIONAL ECONOMICS IN CHINESE

The Chinese International Economics major offers an excellent opportunity for you to develop as a business leader while growing as a global citizen. You will learn the analytical and cultural skills needed to navigate today's interconnected global economy. This major prepares you for successful careers in Asian countries and contexts.

Students take a minimum of six economics courses. They must also take the one-credit Exploring International Economics course (LLEA 33000), preferably in the spring semester, which integrates the study of culture with that of economics.

Students must complete Chinese language courses at least through the third-year level. Those who place out of Third-Year Chinese at any point should consult with the Director of Undergraduate Studies about taking alternative courses. Students must also take one upper-division course in Chinese literature taught by EALC faculty and a second upper-division course in Chinese literature or culture taught by EALC faculty. In addition, students must either take a third upper-division LLEA course in Chinese, Japanese, or Korean literature or culture (that may be taught by non-EALC faculty) or substitute a Fourth-Year Chinese language course.

In their senior year, students must enroll in ECON 48100 in the fall or spring semester to complete a Senior Research Project under the guidance of a faculty member from the Economics Department that focuses on a topic or topics related to the economic, linguistic, and/or cultural characteristics of a country or countries where Chinese is spoken.

Refer to the Department of Economics for the relevant course requirements in economics, which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; and two Economics electives with the IEEL attribute.

MAJOR IN INTERNATIONAL ECONOMICS IN JAPANESE

The Japanese International Economics major offers an excellent opportunity for you to develop as a business leader while growing as a global citizen. You will learn the analytical and cultural skills needed to navigate today's interconnected global economy. This major prepares you for successful careers in Asian countries and contexts.

Students take a minimum of six economics courses. They must also take the one-credit Exploring International Economics course (LLEA 33000), preferably in the spring semester, which integrates the study of culture with that of economics.

Students must complete Japanese language courses at least through the third-year level. Those who place out of Third-Year Japanese at any point should consult with the Director of Undergraduate Studies about taking alternative courses. Students must also take one upper-division course in Japanese literature taught by EALC faculty and a second upper-division course in Japanese literature or culture taught by EALC faculty. In addition, students must take a third upper-division LLEA course in Japanese, Chinese, or Korean literature or culture (that may be taught by non-EALC faculty).

In their senior year, students must enroll in ECON 48100 in the fall or spring semester to complete a Senior Research Project under the guidance of a faculty member from the Economics Department that focuses on a topic or topics related to the economic, linguistic, and/or cultural characteristics of a country or countries where Japanese is spoken.

Refer to the Department of Economics for the relevant course requirements in economics, which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; and two Economics electives with the IEEL attribute.

PROGRAM IN KOREAN

The University offers four years of Korean language instruction and a number of courses relating to Korean culture. Students who finish the sequence at Notre Dame are encouraged to continue their language study abroad. For the minor in Korean, students must complete 15 credit hours, including at least two semesters of Korean language beyond the first year, and one course in Korean culture. The remaining credit hours may be filled by additional courses in Korean language or culture courses offered by the department, or by courses approved by the Director of Undergraduate Studies.

ASIAN STUDIES SUPPLEMENTARY MAJOR AND MINOR

For details, see the Keough School Global Affairs section of the *Undergraduate Bulletin*.

EAST ASIAN LANGUAGES & CULTURES STUDY-ABROAD PROGRAMS

Students have opportunities to study abroad for a summer, a semester, or a year in the People's Republic of China and Japan at the following locations:

Beijing, China: The program at the University of International Business and Economics affords students an opportunity to improve their fluency in spoken and written Mandarin Chinese through intensive training. Participants must have completed at least two semesters of college-level Mandarin or the equivalent. The summer language program is run by Notre Dame.

Shanghai, China: The program at East China Normal University is generally designed for a semester (but it may be extended) that affords students courses in Chinese language, literature, and culture.

Nagoya, Japan: The program at the Catholic Nanzan University offers mandatory courses in intensive Japanese, as well as related courses in literature, religion, business, economics, history, art, and politics. The program is designed for sophomores who have taken a minimum of first-year, intensive Japanese (at the University of Notre Dame) or its equivalent.

Tokyo, Japan: The program at the Catholic Sophia University enables language majors to focus on their language courses while, at the same time, affording a wide-ranging selection of English-language offerings in Asian Studies, international business, economics, history, political science, art history, literature, religion, philosophy, anthropology, and sociology. Sophomores and juniors may participate.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***East Asian Languages & Literatures***
- ***Chinese***
- ***Japanese***
- ***Korean***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Economics

Chair:
Eric R. Sims
Associate Chair:
Christiane Baumeister
Director of Graduate Studies:
Ethan M.J. Lieber
Director of Undergraduate Studies:
Forrest Spence
David F. and Erin M. Seng Foundation Professor:
Joseph P. Kaboski
Alfred C. DeCrane Jr. Professor:
Nelson C. Mark
Keough-Hesburgh Professor:
William Evans
Gilbert F. Schaefer Associate Professors:
Maciej H. Kotowski; Ethan M.J. Lieber
Stepan Family Professor:
Kasey Buckles
Lambert Family Professor:
Christiane Baumeister
Frances D. Rasmus and Jerome A. Castellini Professor:
Jeffrey R. Campbell
Loughrey Professor:
Enrique Seira Bejarano
Gilbert F. Schaefer Professor
Melissa Kearney
Brian and Jeannelle Brady Associate Professor:
Robert C. Johnson
Loughrey Associate Professor:
Taryn Dinkelman
Quinn and Jean Stepan Associate Professor:
Zachary Stangebye
Robert and Irene Bozzone Associate Professor:
Benjamin Pugsley
Patrick J. O'Malley III and Christine A. O'Malley Assistant Professor:
Heitor S. Pellegrina
Wilson Family LEO Assistant Professors:
Robert Collinson; Adrienne Judson; Christopher Mills
Rev. John A. O'Brien Assistant Professor:
Jane Ryngaert
Professors:
Christiane Baumeister; Kasey Buckles; Jeffrey R. Campbell; William Evans; Thomas A. Gresik; Daniel Hungerman; Lakshmi Iyer; Joseph P. Kaboski; Melissa Kearney; Nelson C. Mark; Christian Matthes; Michael Pries; Kali P. Rath; Enrique Seira Bejarano; Eric R. Sims; James Sullivan; Rebecca Thornton
Associate Professors:
Marinho Bertanha; Christopher J. Cronin; Taryn Dinkelman; Kirk Doran; Robert C. Johnson; Maciej H. Kotowski; Ethan M.J. Lieber; Benjamin Pugsley; César Sosa-Padilla; Zachary Stangebye
Assistant Professors:
Victoria Barone; Jooyoung Cha; JoonHwan Cho; Robert Collinson; Jeroen Dalderop; Andrew Ferdowsian; A. Nilesh Fernando; Matthias Hoelzlein; Adrienne Judson; Yijun Liu; Jeremy Majeroviz; Evan Mast; Christopher Mills; Heitor S. Pellegrina; Jane Ryngaert; Niharika Singh; Patrick Turner; Jasmine Xiao
Teaching Professors:
Eva Dziadula; Mary Flannery
Professor of the Practice:
Jeff E. Biddle
Associate Teaching Professors:
Davin Raiha; Forrest Spence
Assistant Teaching Professor:
Cora Bennett
Undergraduate Advisors:
Cora Bennett; Eva Dziadula; Davin Raiha; Forrest Spence

Program of Studies. The major is designed to make a unique contribution to the student's liberal education. The program provides students with the insights of scientific analysis and social perspective to deepen their understanding of the complex economic forces at work in society. Such an understanding is an essential ingredient in the development of an educated person. The program is also designed to prepare the student for a variety of options after graduation, including graduate programs and managerial programs in business and finance.

REQUIREMENTS FOR THE ECONOMICS MAJOR

(i) *Total Course Requirement*
Students must complete the two-semester Principles of Economics sequence (10010/20010 and 10020/20020 or equivalent). Beyond the Principles courses, the major requires a minimum of eight (8) additional course (26 credits) in economics at the junior/senior level (numbered 3xxxx or 4xxxx).

(ii) *Math Requirement*
A course in Calculus (MATH 10360 or equivalent) is a prerequisite for both of the intermediate theory courses. (See core requirement below).

Recommendation: It is strongly recommended that students, especially prospective economic majors, who have not had a course in calculus enroll in MATH 10360 or equivalent during their first year of study.

(iii) Core Requirement
Students must include the following four courses among their minimum of eight courses in economics beyond the Principles course.

30010 Intermediate Microeconomic Theory
30020 Intermediate Macroeconomic Theory
30340 Statistics for Economics
30341 Econometrics

(iv) *Advanced Course Requirement*
Students must include a minimum of two courses (6 credits) at the senior level (numbered 4xxxx) that have either of the intermediate theory courses (30010, 30020) and/or Econometrics (30341) as a prerequisite.

(v) *Writing-Intensive Requirement*
In completing the minimum of 26 credits at the junior/senior 3xxxx/4xxxx level, the student must fulfill a writing-intensive requirement. This requirement can be satisfied in one of the following three ways: by taking a junior or senior 33xxx/43xxx-level economics seminar course; by taking a three credit special studies course consistent with the college's writing-intensive guidelines under the direction of an economics faculty member; or by writing a senior honors thesis under the direction of an economics faculty member.

Departmental advisors will assist students in designing a program of study that meets their educational and career goals. Students are also encouraged to pursue related courses in other departments of the College of Arts and Letters, the Mendoza College of Business, and the College of Science.

UNDERGRADUATE ECONOMICS HONORS PROGRAM

Entry Requirements.
To be eligible for admission to the Undergraduate Economics Honors Program, the student must:

(i) Complete Intermediate Microeconomic Theory (ECON 30010), Intermediate Macroeconomic Theory (ECON 30020), and Econometrics (ECON 30341) with minimum grade point average in these courses of A– (3.667).
or
(ii) Have a minimum cumulative GPA of 3.4 and minimum GPA of A– (3.667) in Principles of Microeconomics (ECON 10010/20010), Principles of Macroeconomics (ECON 10020/20020) Intermediate Microeconomic Theory (ECON 30010), Intermediate Macroeconomic Theory (ECON 30020), Statistics for Economists (30340), and Econometrics (ECON 30341).

(iii) Have completed a minimum of nine courses (27 credit hours) at the junior/senior level. This includes the four required core courses—30010, 30020, 30340, and 30341, and five additional courses at the junior/senior level (numbered 3xxxx/4xxxx), with at least three of these five being at the senior level (4xxxx). The two required capstone courses (see below) can count towards the five additional courses required beyond the four core courses.

CAPSTONE EXPERIENCE

The capstone experience represents the final requirement for the Undergraduate Economics Honors Program. This experience involves three elements:

(i) Completion with a grade of B+ or higher of the Senior Honors Workshop (ECON 43962) in the fall semester of the senior year. These credits can be counted as economics electives toward the major and can be used to satisfy the major's writing intensive requirement.

(ii) Completion with a grade B+ or higher of the Senior Honors Thesis (ECON 48600) in the spring semester of the senior year under the direction or co-direction of an economics faculty member. These credits can be counted as economics electives toward the major and can be used to satisfy the major's writing intensive requirement.

(iii) Participation in all College of Arts and Letters events for departmental honors students.

Applications are due at the end of the spring semester of the junior year and can be submitted through the department's website to the Director of Undergraduate Studies.

MAJOR IN INTERNATIONAL ECONOMICS

The undergraduate major in International Economics is a collaborative effort between the Department of Economics and the departments of languages and literatures affiliated with the International Economics major. In pursuing this major, students take a minimum of eight economics courses and seven to ten intermediate and advanced courses in one of the following languages: Arabic, Chinese, French, German, Italian, Japanese, Portuguese, Russian and Spanish. Students are required to enroll in a one-credit-hour course "Exploring International Economics" designed to foster the integration of the study of culture with the study of economics. Students must complete a senior research project or equivalent designed to integrate their economic and language and culture study. The senior research project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a language. Details about the research project are determined by the relevant language department.

Students must satisfy a mathematics requirement of Calculus (MATH 10360 or equivalent) and successfully complete ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30340; ECON 30341; and two international economics courses as approved by the Director of Undergraduate Studies. Students should refer to their language department for specific language, literature and culture requirements.

Through the major, the collaborating departments seek to blend the programs of study to ensure that students will achieve advanced linguistic and cultural competency in a foreign language as well as excellent preparation in economics. The balance of economics with languages and culture courses should attract motivated students and inspire them to undertake a challenging course of study that will prepare them for post-graduate studies and/or professional career opportunities in the international arena. International Economics majors will learn how aesthetic and cultural categories and value judgments are shaped by economic trends and political conditions, and how political conditions and economic trends are influenced by aesthetic and cultural trends.

CONCENTRATION IN EVIDENCE-BASED POVERTY ALLEVIATION

The Department of Economics also offers a concentration in Evidence-Based Poverty Alleviation (EBPAC).

The EBPAC provides students in the Economics and International Economics majors with the opportunity to learn about poverty and anti-poverty policy through the lens of economics. This concentration is offered by the economics department in conjunction with the Wilson Sheehan Lab for Economic Opportunities (LEO) and the Poverty Research Fellows program. Students in the concentration will be exposed to current research on poverty as it relates to housing, education, health, criminal justice, and economic mobility. They will also learn statistical methods for causal inference that economists use to evaluate anti-poverty policies. This concentration prepares students for careers in economic research, public policy, and governmental and non-governmental organizations.

Admission to the concentration is selective. Both Economics and International Economics majors may apply in the fall of their sophomore year and begin coursework in the spring of their sophomore year. Applications for admission to the concentration should be submitted by Oct. 31 of a student's sophomore year. The department will evaluate all applicants and will make admission decisions by Nov. 15. Admission decisions will be based on factors including overall GPA, performance in prior economics courses, and mathematical background. Strong candidates will show a commitment to contributing to the common good and the desire to work in an anti-poverty related field.

Students pursuing this concentration will be required to fulfill the core requirements of the Economics or International Economics majors, along with the additional requirement of the five classes—two core classes and three electives. These classes jointly satisfy the electives requirements within the Economics or International Economics majors.

Core Classes
All students must take the following two courses:

- Economics of Poverty (ECON 30500)
- Causal Inference for Poverty Alleviation (ECON 40500)

Upper level electives
All students are required to take three economics electives with the EBPA attribute.

The concentration offers additional out-of-classroom enrichment opportunities: on campus with outside speakers such as researchers and practitioners who work on topics related to poverty and anti-poverty policy, as well as off campus with opportunities to travel to DC or provider sites over fall or spring break

CONCENTRATIONS IN FINANCIAL ECONOMICS AND ECONOMETRICS

The Department of Economics also offers a concentration in Financial Economics and Econometrics. This selective program fills a need for additional training in applied quantitative economic reasoning. The coursework for the concentration will provide a fast-paced and rigorous training in financial economics that will prepare students for careers in investment management, banking, research, and policy-making.

Admission to the concentration is selective, and Economics and International Economics majors may apply. Applications for admission to the concentration should be submitted to the Economics Department by March 1 of a student's sophomore year. The department will evaluate all applicants and will make admission decisions by March 15. Admission decisions will be based on factors including overall GPA, performance in prior economics courses, and mathematical background. Students should have completed Intermediate Microeconomic Theory (30010) by the end of their sophomore year.

Students pursuing this concentration will be required to fulfill the core requirements of the Economics or International Economics majors, along with the additional requirement of the five classes—three core classes and two electives. These classes jointly satisfy the electives requirements within the Economics or International Economics majors.

Core Classes
All students must take the following three courses:

Financial Economics (ECON 40354)
Asset Pricing Theory (ECON 40356)
Financial Econometrics (ECON 40357)

Upper level electives
All students are required to take two financial economics electives approved by the Diretor of Undergraduate Studies.

The concentration offers additional out-of-classroom enrichment opportunities, such as presentations by outside researchers and practitioners. These opportunities complement the coursework by offering insights into the world of finance and policymaking, and will be natural opportunities for networking and career advancement.

CONCENTRATION IN EVIDENCE-BASED POVERTY ALLEVIATION

The Department of Economics also offers a concentration in Evidence-Based Poverty Alleviation (EBPAC).

The EBPAC provides students in the Economics and International Economics majors with the opportunity to learn about poverty and anti-poverty policy through the lens of economics. This concentration is offered by the economics department in conjunction with the Wilson Sheehan Lab for Economic Opportunities (LEO) and the Poverty Research Fellows program. Students in the concentration will be exposed to current research on poverty as it relates to housing, education, health, criminal justice, and economic mobility. They will also learn statistical methods for causal inference that economists use to evaluate anti-poverty policies. This concentration prepares students for careers in economic research, public policy, and governmental and non-governmental organizations.

Admission to the concentration is selective. Both Economics and International Economics majors may apply in the fall of their sophomore year and begin coursework in the spring of their sophomore year. Applications for admission to the concentration should be submitted by Oct. 31 of a student's sophomore year. The department will evaluate all applicants and will make admission decisions by Nov. 15. Admission decisions will be based on factors including overall GPA, performance in prior economics courses, and mathematical background. Strong candidates will show a commitment to contributing to the common good and the desire to work in an anti-poverty related field.

Students pursuing this concentration will be required to fulfill the core requirements of the Economics or International Economics majors, along with the additional requirement of the five classes—two core classes and three electives. These classes jointly satisfy the electives requirements within the Economics or International Economics majors.

Core Classes
All students must take the following two courses:
- Economics of Poverty (ECON 30500)
- Causal Inference for Poverty Alleviation (ECON 40500)

Upper level electives
All students are required to take three economics electives with the EBPA attribute.

The concentration offers additional out-of-classroom enrichment opportunities: on campus with outside speakers such as researchers and practitioners who work on topics related to poverty and anti-poverty policy, as well as off campus with opportunities to travel to DC or provider sites over fall or spring break.

THE MINOR IN BUSINESS ECONOMICS

The minor in Business Economics comprises 15 credits. It is open to students in the College of Arts and Letters. Students are required to take Principles of Microeconomics; Principles of Macroeconomics; Statistics; Introductory Accountancy and Introductory Finance. Students may not double-count any of the above courses to fulfill the requirements of their major—but Psychology or Sociology majors can use their respective departmental statistics course to fulfill the statistics requirement of the minor. Approval is required for credit from any other institution. No AP credit will be accepted as a substitute for courses in the minor but may qualify a student for a higher level course. The minor is not open to students majoring in Economics or International Economics.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Economics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

English

Department Chair:
Joyelle McSweeney
Director of Undergraduate Studies:
Laura Betz
Director of Graduate Studies:
Ian Newman
Director of Creative Writing:
Johannes Göransson
George N. Shuster Professor of English Literature:
Laura L. Knoppers
Donald R. Keough Family Professor of Irish Studies:
Barry McCrea
Coyle Professor of Literacy Education:
Ernest Morrell
William R. Keenan Jr. Professor of English:
Sandra Gustafson
Mary Lee Duda Professor of Literature:
Tim William Machan
Professors:
Christopher Abram; Tobias Boes (concurrent); Jim Collins (concurrent); John Duffy; Johannes Göransson; Barbara Green; Susan Harris; Peter Holland (concurrent); Romana Huk; Essaka Joshua; Michelle Karnes; Kate Marshall; Joyelle McSweeney; Orlando Menes; Clíona Ní Ríordáin Mark Sanders; Azareen Van der Vliet Oloomi
Associate Professors:
Dionne Bremyer; Cyraina Johnson-Roullier; Jesse Lander; Susannah Monta; Amy Mulligan; Ian Newman; Francisco Robles; Roy Scranton; Yasmin Solomonescu
Assistant Professors:
Mehak Khan; Matthew Kilbane; Annie Killian; Liam Kruger; Sara Marcus; Brandon Menke; Chanté Mouton Kinyon; Xavier Navarro Aquino; Joseph Rosenberg (concurrent)
Associate Teaching Professor:
Laura Betz

Program of Studies. The English major features small classes in which students read, analyze, and discuss literary works, studying issues of literacy and rhetoric, investigating the symbolic systems that shape cultural meaning, and exploring the broad range of human experience. Majors enjoy an atmosphere of immediate contact with the department's regular teaching and research faculty, who advise students on their course of study. English courses give close attention to student writing, and nearly every majors-level English course is writing-intensive.

English majors choose careers in any field valuing the ability to read, write, and analyze with intelligence and subtlety. Many of our majors find careers in law, business, education, publishing, journalism, marketing, politics, and medicine, as well as myriad other fields. An increasing number of English majors go into service projects and programs such as Teach for America.

ENGLISH MAJOR REQUIREMENTS (CLASS OF 2025 AND LATER)

A major in English consists of 10 courses or 30 credit hours.

7 of the courses must include:
- Introduction to Literary Studies (gateway course)
- Two Cultures courses (one must have REI designation)*
- One Methods, forms, and Genres course
- Three Histories of Literature courses (two must be before 1800)

The remaining 3 courses can be any course within the English Department at the 30xxx level or above.

**REI courses foreground issues of race, ethnicity, or indigeneity*

ENGLISH MAJOR CURRICULUM W/ CREATIVE WRITING CONCENTRATION (CLASS OF 2025 OR LATER)

Students wishing to major in English with an emphasis in Creative Writing must take a total of 10 courses or 30 credit hours.

These must include at least 4 Creative Writing courses, and at least 5 literature courses, specifically:
- Introduction to Literary Studies (gateway course)
- Two Cultures courses (one must have a REI designation.)*
- Two Histories of Literature courses (one must be before 1800)

The four required Creative Writing courses should include:
- No more than one 20xxx-level course
- One 40xxx-level advanced course
- Two different genres (poetry, fiction, creative nonfiction)

The remaining course can be any course within the English Department at the 30XXX level or above.

English Major Honors Concentration. In the English Honors Concentration, select majors create programs tailored to their own particular interest. A faculty mentor guides each of these students through this intensive experience. The main feature of the concentration is writing an honors thesis consisting of a work of literary scholarship.

Eligibility. During the junior year, students are invited to apply to the Honors Concentration after being identified in one of two ways: achieving a GPA of 3.78 or higher in three or more English classes, or 3.6 or higher with a faculty nomination. Invited students declare their interest in the Honors Concentration by completing a Statement of Purpose, a 300-word statement describing what the student intends to focus on during the time in the Honors Concentration.

Requirements. The requirements for the Honors Concentration are slightly different from the prior listing of English major requirements. In the fall of senior year, the student enrolls in ENGL 53001, the Honors Colloquium, which counts for one of the ten courses of the English major; in the spring of senior year, the student enrolls in ENGL 52998, Honors Thesis Credits, to complete the writing of the thesis. The latter is in addition to the 30 hours required for the major.

English Major Honors Concentration in Creative Writing. Students in Creative Writing Honors complete a thesis consisting of a work of creative writing and a reflection on the process of producing it.

Eligibility. During the junior year, students are invited to apply to the Honors Concentration after being identified in one of two ways: achieving a GPA of 3.78 or higher in three or more English courses, or 3.6 or higher with a faculty nomination. Invited students declare their interest by completing a 300-word Statement of Purpose describing the project the student intends to complete.

Requirements. Students must complete all of the requirements for the Creative Writing Concentration. In the fall of their senior year, students take the Creative Writing Honors Thesis Colloquium (ENGL 53002); in the spring of the senior year, the student enrolls in ENGL 52999, Creative Writing Honors Thesis Credits, to complete the writing of the thesis. The thesis will consist of a critical essay on the writing project (10–15 pages), approximately forty pages of prose (e.g., a section of a novel or a selection of short stories) or twenty pages of poetry, and a works cited.

For more information on English major requirements, go to english.nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online by going to classsearch.nd.edu **and selecting the subject English.**

Film, Television, and Theatre

Department Chair:
Pamela Wojcik
Endowed Professors:
McMeel Family Chair in Shakespeare Studies:
Peter Holland
Andrew V. Tackes Professor of Film, Television, and Theatre:
Pamela Wojcik
Endowed Associate Professors:
The William and Helen Carey Chair in Modern Communication, Emeritus:
Susan Ohmer
Thomas J. and Robert T. Rolfs Associate Professor of Film, Television, and Theatre:
Anne García-Romero
Professors:
James M. Collins; Donald Crafton (emeritus); Bríona Nic Dhiarmada (concurrent); William Donahue (concurrent); Jill Godmilow (emeritus); Susan Harris (concurrent); Berthold Hoeckner (concurrent); Peter Holland; Anton Juan (emeritus); Mary Celeste Kearney; Mark C. Pilkinton (emeritus)
Associate Professors:
Reginald F. Bain (emeritus); Christine Becker; Tarryn Li-Min Chun; Kevin C. Dreyer; La Donna Forsgren; Anne García-Romero; Charles Leavitt (concurrent); Olivier Morel; Susan Ohmer; Jason Ruiz (concurrent); Matthew Thomas Payne; Frederic W. Syburg (emeritus)
Assistant Professors:
Pedro Aguilera-Mellado (concurrent); Terrance Brown; Ranjodh Singh Dhaliwal (concurrent); Cecilia Kim; George Sikharulidze; Jeff Spoonhower; Nicole L. Woods (concurrent)
Teaching Professors:
William Donaruma; Richard Donnelly (emeritus); Siiri Scott
Associate Teaching Professors:
C. Ken Cole; Matt Hawkins; Michael Kackman; Theodore E. Mandell; Marcus Stephens
Ryan Producing Artistic Director, Notre Dame Shakespeare Festival:
Scott Jackson

The Department. The Department of Film, Television, and Theatre curriculum includes study of the arts of theatre and performance, film and video, and television. Our goal is to provide students with intellectual and intuitive resources for analysis and production of these performing and media arts. We seek both to encourage and inspire intellectual discipline and curiosity as well as to discover and nurture student creativity. We offer, therefore, both a scholarly and creative context for education of the general liberal arts student at Notre Dame as well as the individual seeking an intensive preparation for advanced study in these fields. In an interdisciplinary spirit of collaboration, students in this department investigate film, television, and theatre (and

occasionally other media) as complex cultural phenomena to develop skills in analysis, evaluation, and theory formation as well as to engage in creative production.

Students graduating from this department have numerous postgraduate choices. Many of our graduates seek careers in law, medicine, business, education, public service, or other professions. Others will pursue careers in theatre, film, or television. However, we are not a professional training program. Rather, we seek to provide the creative and technological tools for student scholar/artists to build a basis for advanced study and professional careers in the arts should they so desire. It is our hope that those whose work and determination lead them to seek careers in these fields will be challenged and assisted by their liberal arts curriculum. Our courses provide tools to understand the analytical, technical and imaginative processes of the field, whether pursued as future work, study, or as an enhancement of intellectual life.

For more information and up-to-date listings of courses and FTT events, visit ftt.nd.edu.

Program of Studies. Students interested in the major are encouraged to visit the departmental office (230 Marie P. DeBartolo Performing Arts Center) for information about the programs and department faculty. Step-by-step instructions for becoming a major are available on our website at ftt.nd.edu. Students may elect to major in the department as either a first or second major in accordance with college guidelines.

Students concentrate in film, television or theatre. Ten courses are needed to complete the major. Each concentration has a core of required classes; subsequent electives may be taken from across the department. All majors are required to take at least one course primarily focused on non-US media or performance cultures or the study of identity and cultural power. Courses meeting this International/Identity requirement cover such topics as national cinemas or performance traditions, global and transnational cultural flows, migration and diaspora, and the study of race and ethnicity, gender and sexuality, dis/ability, nationality and citizenship, religion, and/or age and generation.

The Department of Film, Television, and Theatre participates in several international programs by cross-listing courses and sponsoring internships. For more information, see the Bulletin descriptions for the international programs. Several courses are offered in the summer session, including Introduction to Film and Video Production. See the Summer Session Bulletin for availability and further information.

FTT majors are invited to apply during their junior year to complete a two-semester Senior Thesis project during their senior year. Upon completion of the project, as well as a one-credit writing workshop in the fall of their senior year, students will be eligible to receive the Honors designation upon graduation, provided their project is approved for that designation by the department Honors Committee.

FILM CONCENTRATION

10 courses (30 credit hours):

4 required core courses:
- Basics of Film and Television
- Global Cinema I
- Global Cinema II
- Critical Approaches to Screen Cultures

6 electives (3 at the 40000 level; one that carries International/Identity attribute)

TELEVISION STUDIES CONCENTRATION

10 courses (30 credit hours):

3 required core courses:
- Basics of Film and Television
- History of Television
- Critical Approaches to Television

7 electives (4 at the 40000 level; one that carries International/Identity attribute)

THEATRE CONCENTRATION

10 courses (30 credit hours):

3 required core courses:
- Collaboration: An Introduction to Making Theatre
- World Theatre I
- World Theatre II

7 electives (2 at the 40000 level; one that carries International/Identity attribute)

FILM AND TELEVISION ELECTIVES

Introduction to Film and Television Production
Film and Digital Culture
History of Documentary Film
Film and Popular Music
Digital Devices
Screenwriting
Media Internship
Writing the Short Film
La Telenovela
Shakespeare and Film
Intermediate Filmmaking
Digital Cinema Production
Advanced Digital Cinema Production
Walt Disney in Film and Culture
Contemporary Hollywood
Postmodern Narrative
Documentary Video Production
Sinatra
3D Digital Production for Animation & Video Games
Advanced 3D Digital Production
Sound & Music Design for Digital Media
Broadcast Journalism
The Business of Television
Sports & Television
Entertainment and Arts Law
Media Ethics
Media and the Presidency
The Digital Newsroom
Ireland On Screen
Culture of Italian Immigration
The West of Ireland
Girls Media & Cultural Studies
The Film Producer
Internet Television Production
Media Stardom and Celebrity Culture
Contemporary Hollywood
Media, History, and Memory
The Politics of Style: 1980s Film & TV Culture
Cold War Media Culture
Gender and Rock
Media & Identity
Makin' Em Move
TV as a Storytelling Medium
The Telly in Transition: British TV Today
Media Industries
Transmedia Storytelling
Interactive Storytelling
Germany in Postwar Cinema
Women and Media Culture
Cinemasculinities
The Movie Musical
The Child in Cinema
The Apartment Plot
Queer Media Studies
New Trends in European Non-Fiction Film

THEATRE ELECTIVES

Introduction to Theatre
Latin American Theatre
History of Costume
Shakespeare on the Big Screen
Scene Design
Lighting Design
Costume Design
Shadow Puppetry
Spectacular Asia
Performing Blackness
Musical Theatre History
Creating the Musical
Stage Combat
Devised Performance
Documentary Theatre
Acting: Process
Viewpoints for Actors and Directors
Voice and Movement
Stage Management
Playwriting
Story Structure
Make-up for the Stage
Scenic Painting
Draping and Flat Patterning
Acting: Character
Acting: Text and Technique
Directing: Process
CAD for the Stage
Advanced Technical Production
Broadway Theatre Experience

THEATRE MINOR

The minor in Theatre provide a focused course of study for students in a wide variety of majors across campus who also want to pursue their interests in theatre, but who do not have the time to complete the coursework required for an FTT major. Students can assemble their minor from a mix of courses in performance, design, production, theatre history, and criticism.

5 courses (15 credit hours):

3 credits - World Theatre I or II
9 credits - FTT electives with the Theatre Minor attribute (including up to 3 credits in Production Practica)
3 credits - Capstone Project

MUSICAL THEATRE

This interdisciplinary minor is meant to engage the student who has multiple interests in Musical Theatre. Some students will structure their program around singing and acting, but others around song-writing, or work as conductor/impresario, or stage directing, or scholarship, etc. Admission to introductory classes will not be based on performance ability.

5 courses (15 credit hours):

3 credits - Musical Theatre History
3 credits of course work in FTT courses
3 credits of course work in MUSIC
3 credits from either FTT or MUSIC, with the Musical Theatre Minor Designation
3 credits for a CAPSTONE PROJECT

Current Department of Film, Television, and Theatre courses for the Musical Theatre minor:

Musical Theatre History (required)
Musical Theatre Movement/Dance
Performance Techniques
Production and Performance
The Movie Musical
Disney in Film and Culture
Musical Theatre Lab

Current Department of Music courses for the Musical Theatre minor:

American Popular Song
Voice Lessons for Non-Majors
Theory for Non-Majors
Intro. To Harmony and Voice Leading
Musicianship I
Musicianship II
Musicianship III
Conducting I
Opera in Production
Opera Workshop
Vocal Pedagogy
Voice Science

Complementary Nature of Departmental Concentrations. There is a strong creative and scholarly relationship in the mix of courses and activities of the department of which students should be aware. The concentrations offered by this department can provide many complementary areas of creative and technical study for students involved in film and television production, as well as overlapping historical, theoretical and critical concerns. Similarly, those concentrating in theatre are urged to avail themselves of the many opportunities for production experience and critical, cultural and theoretical studies offered by the theatre faculty.

Cocurricular Activities. The department encourages non-majors to elect courses, participate as audience in our extensive film and theatre series, and involve themselves in film, television, and theatre production as a means of informing and complementing their liberal arts education at Notre Dame. Occasional guest artists and lecturers are also sponsored by the department. Information on all department-sponsored activities is available in the department office and on the department's website.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Film, Television, and Theatre.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Gender Studies

Director:
Perin Gürel
Associate Director:
Pam Butler
Program Coordinator:
Michele Wolff
Internal Scholar-In-Residence:
Vanesa Miseres
Internal Scholar-in-Residence:
Azareen Van der Vliet Oloomi
Concurrent Faculty:
Gail Bederman, Associate Professor, Department of History; Ashley Bohrer, Assistant Professor of Gender and Peace Studies, Keough School of Global Affairs; Kasey Buckles, Professor, Department of Economics; Pam Butler, Associate Director of Gender Studies, Director of Undergraduate Studies; Meredith Chesson, Professor, Department of Anthropology; Kathleen Cummings, Professor, Department of American Studies; Laurel Daen, Assistant Professor, Department of American Studies; La Donna Forsgren, Associate Professor, Department of Film, Television, and Theatre; Karen Graubart, Associate Professor, Department of History; Barbara Green, Professor, Department of English; Perin Gürel, Associate Professor, Department of American Studies; Susan Harris, Professor, Department of English; Eileen M. Hunt, Professor, Department of Political Science; Cyraina Johnson-Roullier, Associate Professor, Department of English; Mary Celeste Kearney, Professor, Department of Film, Television, and Theatre; Janet Kourany, Professor, Department of Philosophy; Julia Kowalski, Associate Professor, Keough School of Global Affairs; Sarah McKibben, Associate Professor, Department of Irish Language and Literature; Abigail Ocobock, Associate Professor, Department of Sociology; Cara Ocobock, Associate Professor, Department of Anthropology; Paul Ocobock, Associate Professor, Department of History; Michael Rea, Professor, Department of Philosophy; Emily Remus, Associate Professor, Department of History; Alison Rice, Professor of French, Department of Romance Languages and Literatures; Francisco Robles, Associate Professor, Department of English; Jason Ruiz, Professor, Department of American Studies; Katherine Walden, Associate Teaching Professor, Department of American Studies; Sophie White, Professor, Department of American Studies; Pamela Wojcik, Professor, Department of Film, Television, and Theatre;

GENDER STUDIES MAJOR, SUPPLEMENTARY MAJOR AND MINOR

Objectives. Gender Studies is an interdisciplinary academic program in the College of Arts and Letters at Notre Dame. Gender Studies analyzes the significance of gender—and the cognate subjects of sex, sexuality, race, ethnicity, class, religion, and nationality—in all areas of human life, especially in the social formation of human identities, practices, and institutions. Gender Studies gives scholars the methodological and theoretical tools to analyze gender and its cognates in their chosen disciplines in the arts, humanities, social sciences, and natural sciences. Gender Studies also provides its students and alumni with an intellectual framework in which the analysis of gender and its cognates can be creatively and critically applied to their personal, familial, professional, and civic roles. In the context of the Catholic identity of Notre Dame, Gender Studies facilitates the study of the intersection of gender and religion in the shaping of ethics, culture, and politics. Alongside our diverse array of courses drawn from across the University, our summer internship and academic-credit internship programs emphasize the holistic and practical life applications of a Gender Studies education at Notre Dame.

Gender Studies offers students a major, a supplementary major and a minor.

Primary Major
(10 courses; 30 credit hours)

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

For students who started at Notre Dame in 2021 or earlier
4 elective courses in one of the following concentrations:
- Arts and Culture
- Religion and Family
- Gender and Society

2–3 additional Gender Studies electives

For students who started at Notre Dame in 2022 or later
3 elective courses with the GSCE – Gender Studies Core Elective attribute
3–4 additional Gender Studies electives

1 senior capstone project:
- regular track: Interdisciplinary Seminar
- research track: senior thesis (6 credits)

Supplementary Major
(8 courses; 24 credit hours)

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

For students who started at Notre Dame in 2021 or earlier
3 elective courses in one of the following concentrations:
- Arts and Culture
- Religion and Family
- Gender and Society

For students who started at Notre Dame in 2022 or later
3 elective courses with the GSCE – Gender Studies Core Elective attribute
2 additional electives

1 senior capstone project:
- regular track: Interdisciplinary Seminar
- research track: capstone essay (3 credits; completed in Fall of senior year)

Minor
(5 courses; 15 credit hours)

2 required courses:
- Introduction to Gender Studies
- Perspectives on Gender: Theory and Practice

3 Gender Studies elective courses

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Gender Studies.* Course descriptions can be found by clicking on the subject code and course number in the search results.

German, Slavic, and Eurasian Studies

Chair:
Tobias Boes
John J. Cavanaugh, C.S.C., Professor of Humanities:
William C. Donahue
Paul G. Kimball Professor of Arts and Letters:
Vittorio Hösle
Rev. Edmund P. Joyce, C.S.C., Professor of German Language and Literature:
Mark W. Roche
Professors:
Tobias Boes; C.J. Jones; Thomas G. Marullo (emeritus); Robert E. Norton; Vera B. Profit (emeritus); Mark W. Roche
Associate Professors:
David W. Gasperetti (emeritus); Sean Griffin; Emily Wang
Assistant Professor:
Arpi Movsesian
Teaching Professors:
Denise M. Della Rossa (emeritus); Hannelore Weber (emeritus)
Assistant Teaching Professor:
Tetyana Shlikhar

Program of Studies. The study of German, Slavic, and Eurasian language, literature, and culture provides educational opportunities that are of great value in today's interdependent world. The acquisition of foreign language skills in general is an important component of liberation education because it offers a novel perspective on the world, enhances students' powers of communication and serves to introduce them to the cultural achievements of other peoples. Exposure to German, Slavic, and Eurasian culture similarly widens students' intellectual horizons, and facilitates the examination of global affairs in a more sophisticated and cosmopolitan manner.

The Department. The Department of German, Slavic, and Eurasian Studies offers instruction in German and Russian at all levels of competence, from beginning language courses at the 10000 level to literature, history, and culture courses on the 30000 and 40000 levels. We also offer a diverse roster of courses in English that introduce students to the culture, social structure, politics, and religious life of the German, Slavic and Eurasian countries.

THE GERMAN PROGRAM

Director of Undergraduate Studies:
TBA

REQUIREMENTS: MAJOR, SUPPLEMENTARY MAJOR, AND MINOR

Major in German
Successful completion of 10 courses (30 credit hours) beyond 20201.

These 10 courses must include successful completion of 20202; any two of 30303, 30304, or 30305; and an additional 7 electives, four of which must be numbered 20113 or above; two must be at the 4000-level; three must be in German.

Supplementary Major in German
Successful completion of 8 courses (24 credit hours) beyond 20201.

These 8 courses must include successful completion of 20202; any two of 30303, 30304, and 30305; and an additional 5 electives, three of which must be numbered 20113 or above; one must be at the 4000-level; three must be in German.

Major in International Economics in German
The undergraduate major in International Economics is a collaborative effort between the Department of Economics and affiliated departments of languages and literature. In pursuing this major, students take a minimum of eight economics courses and six courses in German beyond the language requirement. Students are also required to enroll in a one-credit "Exploring International Economics" course, preferably their sophomore year, designed to foster the integration of the study of culture with the study of economics. Under the guidance of a faculty mentor, international economics majors in German integrate their economic and language and culture study into a senior research project or senior thesis. This project or thesis is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of German studies.

German Requirements: Successful completion of 6 courses (18 credit hours) beyond 20201.

These 6 courses must include successful completion of 20202 and 5 electives, three of which must be in German. Refer to the Department of Economics for the relevant course requirements in economics which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10011/20011; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; ECON 48100; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

Minor in German
Successful completion of 5 courses (15 credit hours) beyond the three semester language sequence. These 5 courses must include successful completion of 20202; any two of 30303, 30304, and 30305; and an additional 3 electives, two of which must be numbered 20113 or above; one must be at the 4000-level; one must be in German.

Minor in German Studies
Successful completion of 5 courses (15 credit hours) in German Studies numbered 20202 or above. Courses may be in any combination of German and English-language classes. An all-English curriculum is possible. University Seminars and College Seminars with a German Studies focus may also count towards this requirement with approval of the DUS.

At least 3 courses must be listed or cross-listed in the Department or taken in a Department-approved study abroad program.

All German Studies courses taken outside of the Department must be approved by the DUS in German.

Study Abroad
Students who participate in a study abroad program during the academic year must take at least 1 course from departmental offerings after their return to the home campus. Only one intensive language course taken abroad, whether completed during a summer program or the academic year, will count as an elective toward the first major, supplementary major, or minor.

Summer Language Courses
If a student completes a summer language program beyond the B1 level or its equivalent at a different institution, up to three credits towards any Department degree may be awarded, provided the following conditions are met:

1. The student must submit the results of an official exam (such as Goethe-Zertifikat, Goethe-Test PRO, TestDaF).
2. The exam must show that proficiency has improved by at least one level in at least two of the four skills (speaking, listening, reading, writing). Final approval is at the discretion of the DUS in German.

Senior Thesis and Departmental Honors
German majors or supplementary majors who elect to write a ***Senior Thesis*** must meet the following requirements:

1. The student must have a GPA of 3.0 or higher in the major,
2. Should be nominated by two members of the German faculty during the spring semester of his or her junior year and no later than the first week of classes fall semester of the senior year, and
3. The thesis may be written in either German or English with a length of between 25–35 pages, including notes and references. (Exceptions beyond 35 pages require advisor approval.) Two bound copies of the final document are to be submitted to the Department of German

For the fall semester the student will receive a satisfactory/unsatisfactory grade (3 credits) for GE 48499. At the completion of the thesis in the spring semester, the student will be given a letter grade (3 credits) for GE 48498. Only the spring credits may count toward the 30-credit hour requirement for the major or the 24-credit hour requirement for the supplementary major.

German first majors who wish to receive ***Departmental Honors*** must meet the above criteria as well as the following:

1. The student will present their thesis work in a public forum, such as a departmental colloquium or an undergraduate conference, and

2. The student must maintain a departmental GPA of 3.5 and receive no lower than an A– on the Senior Thesis.

THE SLAVIC AND EURASIAN PROGRAM

Director of Undergraduate Studies:
Tetyana Shlikhar

The Major in Russian
Majors in Russian must complete ten courses (thirty credit hours) at the 20000 level and above, including at least six courses taught by departmental faculty. Intermediate Russian I and II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in a Russian-speaking country are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take six three-credit literature or culture courses offered by the department numbered at least 20201, including at least one course each at the 30000 and 40000 levels. With the permission of the Director of Undergraduate Studies, one course on a Slavic and Eurasian subject taught in another department, such as Anthropology, History, Political Science, or Theology, may be counted toward the Russian major.

The Supplementary Major in Russian
Supplementary majors in Russian must complete eight courses (twenty-four credit hours) at the 20000

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**removed mention of German Studies Supplemental Major*

level and above, including at least four courses taught by departmental faculty. Intermediate Russian I and II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in a Russian-speaking country are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take four three-credit literature or culture courses offered by the department, one at the 30000 level and one at the 40000 level. With the permission of the Director of Undergraduate Studies, one course on a Slavic and Eurasian subject taught in another department, such as Anthropology, History, Political Science, or Theology, may be counted toward the Russian supplementary major.

The Major in International Economics in Russian
Combining the study of economics with the knowledge of another country's language and culture can be a powerful advantage in business. The Major in International Economics in Russian is designed to provide this edge by preparing students for the challenges of an ever more interconnected global economy. The requirements for the major include the following: RU 33000 "Exploring International Economics" (one credit, must be taken in the sophomore year), which fosters an integrated approach to the study of culture and economics; six courses (18 credits) from Slavic and Eurasian departmental offerings at the 20000 level and above, including RU 20101: Intermediate Russian I, RU 20102: Intermediate Russian II, RU 30101: Advanced Russian I, RU 30102: Advanced Russian II; and one literature/culture elective each at the 30000 and 40000 levels. These courses must be taken in residence in the department. However, participants in an approved semester-long program in a Russian-speaking country are automatically exempted from the language course that is offered concurrently with their semester abroad. All international economics majors combine their study of economics, language, literature, and Slavic and Eurasian culture in a senior research project or senior thesis written under the guidance of a faculty mentor.

Refer to the Department of Economics for the relevant course requirements in economics, which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10011/20011; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; ECON 48100; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

The Minor in Russian
The Russian minor consists of five courses (fifteen credits) at the 20000 level or above taught by departmental faculty. Course selection must include at least two language courses at the student's appropriate level and three additional three-credit courses numbered 20201 or above, at least two of which must be at the 30000-level or above.

The Minor in Slavic and Eurasian Studies
The Minor in Slavic and Eurasian Studies allows students interested in Slavic, East European, and Eurasian culture an opportunity to develop cultural competency in the region without a focus on language study. It consists of five three-credit courses (15 credit hours) at the 20201-level or above, three of which will be taught by faculty in the Department of German, Slavic and Eurasian Studies. University Seminars and College Seminars with a Slavic Studies focus may also count towards this requirement with approval of the DUS. In order to expose students to diverse analytical approaches and a richer variety of cultural data, they are encouraged to take courses that engage with art, film, literature, history, philosophy, political science, and theology. Students may apply courses taken away from Notre Dame towards this minor with the approval of the Directory of Undergraduate Studies.

Study Abroad
Our students are encouraged to experience firsthand the excitement of being immersed in Slavic and Eurasian culture through participation in a study program in a country where the target language is spoken. Programs are available during the summer (five to nine weeks) or for an entire semester or academic year. Credits earned for course work taken in an approved program may be applied toward a Russian major or minor at Notre Dame.

Senior Thesis/Honors Track
Russian majors or supplementary majors who elect to write a Senior Thesis must meet the following requirements: 1) The student must have a GPA of 3.0 or higher in the major, 2) Should be nominated by two members of the Slavic faculty during the spring semester of his or her junior year and no later than the first week of classes fall semester of the senior year, and 3) The thesis may be written in either Russian or English with a length of between 25–35 pages, including notes and references. (Exceptions beyond 35 pages require advisor approval.) Two bound copies of the final document are to be submitted to the Department. For the fall semester the student will receive a satisfactory/unsatisfactory grade (3 credits). At the completion of the thesis in the spring semester, the student will be given a letter grade (3 credits). Only the spring credits may count toward the 30-credit hour requirement for the major or the 24-credit hour requirement for the supplementary major. Russian majors who wish to receive Departmental Honors must meet the above criteria as well as the following: 1) The student will present their thesis work in a public forum, such as a departmental colloquium or an undergraduate conference, and 2) The student must maintain a departmental GPA of 3.5 and receive no lower than an A– on the Senior Thesis.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes in German or Russian for a given semester may be found by clicking on "Class Search" and selecting either German or Russian/Slavic from the Subject menu. Course descriptions can be found by clicking on the subject code and course number in the search results.

History

William Payden Collegiate Chair:
Elisabeth Köll
Director of Undergraduate Studies:
Rev. Robert Sullivan (interim)
Director of Graduate Studies:
Alexander Martin
Francis A. McAnaney Professor of History:
John T. McGreevy
William P. Reynolds Professor of History:
Felipe Fernández-Armesto
Madden-Hennebry Professor of Irish American History:
Patrick Griffin
Professors:
R. Scott Appleby; Ted Beatty; Alexander Beihammer; Tom Burman; Jon Coleman; Kathleen Cummings; Darren Dochuk; Felipe Fernández-Armesto; Karen Graubart; Brad Gregory; Patrick Griffin; Asher Kaufman; Elisabeth Köll; Semion Lyandres; Alexander Martin; John T. McGreevy; Margaret Meserve; Rev. Robert Sullivan; Julia Adeney Thomas
Professors Emeriti:
Rev. Thomas Blantz, C.S.C.; Jay P. Dolan; J. Philip Gleason; Christopher S. Hamlin; Rev Robert L. Kerby; Thomas A. Kselman; George Marsden; Rev. Wilson D. Miscamble, C.S.C.; Dian H. Murray; Thomas Noble; Mark Noll; Rev. Marvin R. O'Connell; Ingrid Rowland; James Turner; Tom Tweed; John H. Van Engen; Andrzej Walicki
Associate Professors:
Gail Bederman; Liang Cai; Katlyn Carter; John Deak; Daniel Hobbins; Katie Jarvis; Ian Johnson; Rebecca McKenna; Nikhil Menon; Paul Ocobock; Jaime Pensado; Richard Pierce; Linda Przybyszewski; Evan Ragland; Rory Rapple; Emily Remus; Sarah Shortall; Joshua Specht; Deborah Tor
Assistant Professors:
Emiliano Aguilar; Nathalie Barton; Rev. Stephen Koeth, C.S.C.; Ijeoma Kola
Teaching Professor:
Daniel A. Graff
Concurrent Faculty:
Christopher Baron (Classics); Colin Barr (Keough School); Annie Gilbert Coleman (American Studies); Korey Garibaldi (American Studies); Robert Goulding (Program of Liberal Studies); Lionel Jensen (East Asian Languages & Cultures); John Soares; Thomas A. Stapleford (History and Philosophy of Science); Sophie White (American Studies)

Program of Studies. The Department of History offers undergraduate courses that span global regions from the ancient world to the present. Courses are both regional and thematic in approach and designed to emphasize global connections across space. Both smaller seminars and larger lecture-style courses require students to develop critical skills reading primary and secondary sources, and in historical thinking and writing.

The Major in History. For students interested in pursuing a History major, the department offers a rigorous program of ten 3-credit courses. The sequence begins for all standard majors with an exciting introductory seminar (HIST 33000–History Workshop), which introduces students to the work of writing history through a series primary source-based case studies. To encourage breadth of historical knowledge, majors also take a variety of courses in different chronological periods and global regions.

Standard majors will take four breadth courses: one global course, and three courses from five regions: Africa and the Middle East, Asia, Europe, Latin America, North America. To encourage depth, standard majors will select a three-course concentration in one of five regional categories (Africa and the Middle East, Asia, Europe, Latin America, North America), or, a thematic cluster (such as Global Empires, War and Society, Business and Economics, or Religion). Majors may also petition the Director of Undergraduate Studies to define their own thematic cluster. Standard majors will also one additional free elective in any field they choose. All majors must declare their concentration by the end of the junior year.

To complete their coursework, all standard majors, regardless of class year, must take a departmental seminar (HIST 35000 or above). This writing-intensive course prioritizes research in primary sources toward the production of a substantial paper. The departmental seminar also emphasizes writing as a process, encouraging students to perform continual revisions and share their writing with peers.

All standard majors must also take at least one course in pre-modern (pre-1500) history.

Application of AP Credits to the Major in History. Students who received a score of 5 on an AP history subject test (US, European, or World) may apply 3 credits toward the major in history. No more than 3 AP credits may be applied to the major.

The Minor in History. The minor in history is designed to offer a formal program and pedagogical structure to those students who have an interest in history, but do not have room to be full majors. The program is designed to be flexible while offering students an introduction to the discipline of history.

The minor in history consists of five 3-credit hour courses with no prerequisites: History Workshop (HIST 33000) and four general electives, one of which must include a research component (with no more than one course taken abroad, and no more than one taken at the 10000 level, including history university seminars).

The Minor in Economic and Business History. This more targeted minor program introduces students to the intertwined histories of economics, business, finance, capitalism, labor, and political economy. It is designed for students entering professional careers that require a deep understanding of the economic, political, and historical complexities of the global age. The minor consists of five 3-credit hour courses with no prerequisites. Students take four general electives from a roster of courses approved by the Department of History. In addition, students will have to take the new capstone course "Economy and Business in History" which allows them to synthesize and apply the methodologies and approaches of the discipline to their writing assignments, including a required research paper as a final assignment.

History Honors Program. The History Department offers a special program of study, the History Honors Program, for the most talented and motivated history majors. Students are invited to apply in the fall semester of the junior year; the program begins in the spring of the junior year. A student in the History Honors Program will take 11 three-credit history courses to satisfy both the Honors Program and standard history major requirements. In addition to taking the introductory gateway course (HIST 33000, History Workshop) and a variety of courses emphasizing geographical and chronological breadth, the student will also take two special honors seminars. Instead of completing a departmental seminar, the student will research and write a yearlong senior thesis, receiving three credits in each semester of the senior year. Each history honors student will select an area of concentration tailored to his or her thesis topic and will take two additional courses in this field to complete the program.

In the spring of the junior year, the student will enroll in an Honors Program Methodology Seminar (HIST 53001), designed to introduce the student to the various methods historians utilize to analyze and write about the past. [Students admitted to the Honors Program, but studying abroad during the spring semester junior year, will be exempt from HIST 53001. They must, however, register a thesis topic and advisor with the director of Undergraduate Studies by the end of that semester.] In the fall of the senior year, the student will enroll in the Honors Program Historiography Colloquium (HIST 53002), intended to introduce the student to basic issues of critical interpretation and historiography through a specific field. In the fall and spring of the senior year, the student will work on a thesis (40 to 80 pages) under the supervision of a specific faculty member. The student will register for HIST 58003 (three senior thesis credits) in the fall and HIST 58004 (three senior thesis credits) in the spring of the senior year.

Phi Theta Alpha. Students who have completed at least four major courses in history, earning a grade point average of 3.8 or above are eligible for the Notre Dame chapter of Phi Alpha Theta, a national history honor society. The History Department initiates new members once per year in the spring.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *History*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Mathematics

Chair:
David Galvin
Associate Chair:
Peter Cholak
Director of Graduate Studies:
Samuel R. Evens
Director of Undergraduate Studies:
Andrei Jorza
William J. Hank Family Professor of Mathematics:
Anand Pillay
John and Margaret McAndrews Professor of Mathematics:
Mark Behrens
John A. Zahm, C.S.C., Professor of Mathematics
Stephen A. Stolz
Glynn Family Honors Collegiate Professor:
Claudia Polini
Notre Dame Professor of Topology:
Andrew Putman
Professors:
Peter A. Cholak; Francis X. Connolly (emeritus); Jeffrey A. Diller; Natasha Dobrinen; William G. Dwyer (emeritus); Matthew J. Dyer; Samuel R. Evens; Leonid Faybusovich (emeritus); David Galvin; Michael Gekhtman; Karsten Grove (emeritus); Matthew Gursky; Alexander J. Hahn (emeritus); Brian C. Hall; Qing Han; Alex A. Himonas; Richard Hind; Julia F. Knight (emeritus); Francois Ledrappier (emeritus); Juan Migliore; Gerard K. Misiolek; Liviu Nicolaescu; Claudiu Raicu; Mei-Chi Shaw (emeritus); Roxana Smarandache; Brian Smyth (emeritus); Dennis M. Snow (emeritus); Nancy K. Stanton (emeritus); Sergei Starchenko; Laurence R. Taylor; Warren J. Wong (emeritus); Jiahong Wu; Frederico Xavier (emeritus)
Associate Professors:
Katrina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Pavel Mnev; Eric Riedl; Christopher Schommer-Pries
Assistant Professors:
Nicholas Edelen; Steven Karp; Alexandra Kjuchukova; Juanita Pinzón Caicedo; Nicholas Ramsey; Marianna Russkikh; Nick Salter; Shuddhodan Kadattur Vasudevan
Professors of the Practice:
Arthur Lim; Neil Nicholson; Annette Pilkington
Associate Professor of the Practice:
Andrei Jorza
Assistant Teaching Professors:
Brian Mulholland; Kathryn Mulholland

Program of Studies. Students in the College of Arts and Letters may pursue a major in mathematics with a concentration in honors. (Note that this program should not be confused with the Arts and Letters/Science Honors program and that several concentrations, including Honors, are available with a major in mathematics in the College of Science.) The mathematics major in arts and letters aims to give the student a thorough liberal intellectual discipline and to furnish an adequate background for other fields of study. At the same time it prepares the student for graduate work in mathematics, and many of those who have taken the program have entered graduate schools in that field. Others have entered philosophy, medicine, law, economics and industrial management.

Students intending to follow this major in the College of Arts and Letters must declare their intention to the advisor indicated by the mathematics department and the dean of Arts and Letters at advance registration in the spring of their freshman year. Students must have completed or be completing satisfactory work in MATH 10850 and 10860 The program of their studies is subject in its entirety to approval by the advisor.

Students whose first major is in the College of Arts and Letters may also pursue a second major in mathematics. See "Mathematics as a Second Major" in the College of Science section of this *Bulletin*.

THE PROGRAM OF COURSES

First Year

First Semester	
English	3
University Requirement	3
MATH 10850. Honors Mathematics I	4
Natural Science	3
Language: (French, German or Russian recommended)	3
Moreau First Year Seminar	1
	17

Second Semester	
Language: French, German or Russian	3
University Seminar	3
MATH 10860. Honors Mathematics II	4
Natural Science	3
Electives	3
	16

Sophomore Year

First Semester	
College Seminar	3
Language: French, German or Russian	3
University Requirement	3
MATH 20810. Honors Algebra I	3
MATH 20850. Honors Mathematics III	4
	16

Second Semester	
Introduction to Philosophy	3
University Requirement	3
Theology	3
MATH 20820. Honors Algebra II	3
MATH 20860. Honors Mathematics IV	4
	16

Junior Year

First Semester

Theology	3
MATH 30810. Honors Algebra III	3
MATH 30850. Honors Analysis I	3
Elective	5
University Requirement	3
	17

Second Semester

Philosophy	3
MATH 30820. Honors Algebra IV	3
MATH 30860. Honors Analysis II	3
English/American Literature	3
Elective	3
	15

Senior Year

First Semester

Mathematics Electives	6
Electives	9
	15

Second Semester

Mathematics Electives	6
Electives	9
Moreau Senior Capstone	1
	16

(At least six credits of mathematics electives must be at the 40xxx level.)

The Senior Thesis for Mathematics Majors

Students in the mathematics program have the option of writing a thesis on a subject in mathematics, or in an interdisciplinary area connected to mathematics. Such a thesis is strongly encouraged for math honors students and is intended to give the student a better sense of how mathematics is done and used, and to develop in the student the habit of learning mathematics and its applications in an independent setting. In most cases, this work would be expected to be expository, but based on advanced-level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject, or to explore one of the many interesting connections that mathematics has with other disciplines.

In the second semester of the junior year and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis. The thesis is to be crafted during the second semester of the senior year, and must be submitted to the director of undergraduate studies by April 15 of the senior year. If the thesis is approved, the citation of "Graduation with Senior Thesis" will appear on the student's transcript.

In the second semester of the junior and senior years, the student attends the senior thesis writing seminar Math 48900, while in the first semester of the senior year, the student receives credit for Math 48800.

Students interested in writing a senior thesis should contact the director of undergraduate studies in the Department of Mathematics.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Mathematics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Medieval Studies

Robert M. Conway Director of the Medieval Institute:
TBA

Director of Undergraduate Studies:
Christopher Liebtag-Miller (Medieval Studies)

Fellows of the Medieval Institute:
Hussein Abdulsater (Classics: Arabic); Christopher Abram (English); Khaled Anatolios (Theology); Ann Astell (Theology); Rev. Yury Avvakumov (Theology); Laura Banella (Romance Languages: Italian); Alexander Beihammer (History); Judith Benz (German); W. Martin Bloomer (Classics: Latin); Jeremy Phillip Brown (Theology); Katie Bugyis (Liberal Studies); Thomas Burman (History); Theodore J. Cachey Jr. (Romance Languages: Italian); Therese Cory (Philosophy); Rev. Brian E. Daley, S.J. (Theology); Stephen D. Dumont (Philosophy) Margot Fassler (Music, Theology); Felipe Fernández-Armesto (History); Leonardo Francalanci (Romance Languages: Catalan, Spanish); Nina Glibetić (Theology); Robert Sean Griffin (Russian); Goulding (History and Philosophy of Science); Karen Graubart (History); Li Guo (Classics: Arabic); David Gura (Hesburgh Libraries); Marius Hauknes (Art History); Daniel Hobbins (History); Alexander Hsu (History); Peter Jeffery (Music); Robin Jensen (Theology); Claire Taylor Jones (German); Carlos Jáuregui (Romance Languages: Spanish); Johannes Junge Ruhland (Romance Languages: French); Mary M. Keys (Political Science); David Lincicum (Theology); Tim Machan (English); Linda Major (Medieval Studies); Rebecca Maloy (Music); Julia Marvin (Liberal Studies); Peter McQuillan (Irish Language and Literature); Margaret Meserve (History); Christopher Liebtag Miller (Medieval Studies); Hildegund Müller (Classics: Latin); Amy Mulligan (Irish Language and Literature); Classics); Stephen Ogden (Philosophy, Islamic Studies); Andrew Radde-Gallwitz (Liberal Studies, Theology); Gabriel Radle (Theology); Rory Rapple (History); Gretchen Reydams-Schils (Liberal Studies; Philosophy); Gabriel Said Reynolds (Theology); Denis Robichaud (Liberal Studies); Julia Schneider (Hesburgh Libraries); Deborah Tor (History); Alexis Torrance (Theology); Juan Vitulli (Romance Languages: Spanish); Joseph P. Wawrykow (Theology); Jeff Wickes (Theology)

Medieval Institute Emeriti:
Zygmunt G. Baranski (Romance Languages: Italian, emeritus); D'Arcy J. D. Boulton (Medieval Studies, emeritus); Maureen B. McCann Boulton (Romance Languages: French, emeritus); Calvin Bower (Music, emeritus); Robert R. Coleman (Art History, emeritus); JoAnn DellaNeva (Romance Languages: French, emeritus); Rev. Michael S. Driscoll (Theology, emeritus); Kent Emery, Jr. (Liberal Studies; Philosophy, emeritus); Margot Fassler (Music, Theology, emeritus); Alfred

Freddoso (Philosophy, emeritus); Stephen E. Gersh (Philosophy, emeritus); Louis Jordan (Hesburgh Libraries, emeritus); Encarnación Juárez-Almendros (Romance Languages: Spanish, emeritus); Kathryn Kerby-Fulton (English, emeritus); Christian R. Moevs (Romance Languages: Italian, emeritus); Mark C. Pilkinton (Theatre, emeritus); Charles Rosenberg (Art History, emeritus); Dayle Seidenspinner-Núñez (Romance Languages: Spanish, emeritus); John Van Engen (History, emeritus)

Program of Studies. The Medieval Institute is one of Notre Dame's oldest and most renowned centers of learning. Established in 1946, it was envisaged from the start to be a premier locus for the study of the European Middle Ages. Over the decades its scope has broadened to where it now embraces a global Middle Ages, incorporating a multiplicity of cultures, faiths, and traditions. The academic strength and stature of the institute are due not only to its faculty, students, and library, but also to its ongoing commitment to the original liberal arts ideal.

Medieval Studies prepares students to enter graduate school, law school, medical school, or various careers such as business, government, education, publishing, ministry, curatorship, and research. With an emphasis on close reading, precise textual analysis, careful writing, and vigorous discussion, the program is designed to foster critical thinking, oral and written communication skills, and a heightened appreciation for history, religion, and culture.

Far from being the "dark ages," medieval civilization witnessed the dawn of many of today's most vital institutions and traditions including not only universities and hospitals, but also crucial developments in legal and economic systems, religious communities and doctrine, architecture, engineering, science, art, and literature. Today, the Middle Ages remains profoundly relevant not only through its inheritance, but also through an on-going process of imagining and reimagining of the medieval that permeates our lives, from pop-culture to politics, and from escapist entertainment to international policy.

The Medieval Studies program offers four undergraduate tracks, each based on an interdisciplinary model. It draws courses from many departments, spanning nearly the entirety of the College of Arts and Letters. From these disciplines, students are encouraged to build a unique program of study, in consultation with a faculty advisor, around an area of concentration that captures an interest, prepares for a field, or contributes to an academic pursuit.

Students interested in Medieval Studies may elect one of the following four options:

1. Major in Medieval Studies
2. Honors Major in Medieval Studies
3. Supplementary Major in Medieval Studies
4. Minor in Medieval Studies

All three major tracks include two common components. Each student's curriculum is built around a concentration chosen by the individual, in conjunction with a faculty advisor. The concentration requires a minimum of four interrelated courses reflecting an intellectual and curricular coherence. An advanced seminar (3 credits) is the second common element in each of the major tracks. Students in the seminar are expected to read widely and discuss vigorously a set of sources that present a particular issue from several points of view. In addition, they are also expected to write a substantial research paper. The goal of the seminar is to engage students in thinking critically and knowledgeably across the boundaries of traditional disciplines while maintaining a focus on a particular time, place, or issue.

The three major tracks and the minor track also have an introductory required survey (3 credits), MI 20001, The World of the Middle Ages.

Following are brief outlines of the basic requirements for the three major tracks and the minor track. Further details can be obtained from the director of undergraduate studies in the Medieval Institute.

Medieval Studies Major (30 credits)

- Introductory Survey/The World of the Middle Ages
- Four courses drawn from two or more departments representing a concentration
- Four electives in Medieval Studies drawn from at least two departments
- One advanced seminar (4xxxx-level or above) in Medieval Studies

Medieval Studies Honors Major (36 credits)

- Same requirements as major in Medieval Studies (see above)
- EXCEPT one intermediate Latin course and one advanced Latin course are required in lieu of two medieval electives
- PLUS an honors thesis for 6 credits

Medieval Studies Supp. Major (24 credits)

- The World of the Middle Ages course
- Four courses drawn from two or more departments representing a concentration
- Two electives in Medieval Studies
- One advanced seminar (4xxx-level or above) in Medieval Studies

Medieval Studies Minor (15 credits)

- The World of the Middle Ages course
- Three electives in Medieval Studies drawn from at least two departments
- One advanced seminar (4xxx-level or above) in Medieval Studies

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Medieval Institute.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Music

Chair:
Berthold Hoeckner
Director of Undergraduate Studies:
John Liberatore
Keough-Hesburgh Professors of Music History and Liturgy:
Margot Fassler (emeritus); Berthold Hoeckner
Michael P. Grace Chair in Medieval Studies:
Peter Jeffery (emeritus)
J.W. Van Gorkom Professor of Music:
Susan L. Youens (emeritus)
Professors:
Alexander Blachly (emeritus); John Blacklow; Calvin M. Bower (emeritus); William Cerny (emeritus); Craig J. Cramer (emeritus); Kenneth W. Dye; Rebecca Maloy; Kola Owolabi; Georgine Resick (emeritus); Peter Smith
Professors of the Practice:
Stephen Lancaster; Daniel Schlosberg
Associate Professors:
Karen L. Buranskas (emeritus); Mary E. Frandsen (emeritus); Paul G. Johnson (emeritus); John Liberatore; Carolyn R. Plummer (emeritus)
Assistant Professors:
David Bird; Michael Carlson; Jon Bullock; Johanna Frymoyer; Jeni Houser; Patrick Yim
Associate Professor of the Practice:
Paul Walker (emeritus)
Associate Teaching Professors:
Lawrence H. Dwyer; Daniel C. Stowe
Assistant Professor of the Practice:
Dror Baitel
Concurrent Faculty:
Christopher Chowrimootoo; Arman Schwartz; Heather Wiebe
Band Staff:
Emma Fell; Matthew Merten; Victoria Paspalas; Sam Sanchez

Mission Statement:
Perform with passion. Study with rigor. Learn with discernment.

Following Notre Dame's rich liberal arts tradition, our Department combines different forms of music making with research that explores theories, histories, and cultures of music. We promote excellence in musical performance, composition, and scholarship in a spirit of inclusion, bringing together students with various skills and diverse backgrounds to study and collaborate with our distinguished and dedicated faculty in first-rate facilities.

Program of Studies: The Department's programs provide its majors the opportunity to receive the essential training and experiences to prepare for graduate school and careers in music. In addition, the Department offers many opportunities for students interested in a double-majoring or minoring in music, as well as for all other students who wish simply to further their musical development.

The Department features small class sizes and well-equipped classrooms and studios. Situated within the College of Arts and Letters, the music curriculum contributes to a liberal arts education that is both rigorous and broad. Majors may choose one of two concentrations in Music. The Department recommends the Honors track for students interested in pursuing graduate study in music.

Advising: Each major will be assigned a faculty advisor who must be consulted in person each semester to discuss the program of study before registering for classes.

Lessons: Music majors in the Performance concentration qualify for a 100 percent discount on applied lessons in their primary instrument. Music majors in the Academic Concentration qualify for a 50 percent discount on up to six credits of applied lessons. Music minors qualify for a 100 percent discount on up to six credits of applied lessons. Applied lessons are also available to non-majors for a fee charged to the student's account.

Elective credits: These are courses with an MUS course number in Music Theory, Musicology, Ethnomusicology, History, Music Technology, or Composition. Elective credits cannot be filled with Applied Lessons, Ensembles, or Performance Electives.

Ensembles: Departmentally approved ensembles may be taken for 1 or 0 credits. Music majors in the Performance concentration require four semesters' worth of ensemble participation, while students in the Academic concentration require two. Participating in multiple ensembles at once fills multiple semesters worth of this requirement. For a list of departmentally approved ensembles, contact Senior Staff Assistant Emily Matz: matz.5@nd.edu.

Musicianship: Musicianship Lab I and II are 1-credit prerequisite courses for the major. Students may test out of either or both of these requirements. Otherwise, the Department recommends taking these labs concurrently with Materials and Techniques of Music I and II.

Placement Exam: Students wishing to enroll in Materials and Techniques of Music I, II, or Music Fundamentals (MUS 10xxx) will take a theory placement exam to determine which course best suits their needs as an entrance into the theory sequence.

ACADEMIC CONCENTRATION

Class	Credits
Materials and Techniques of Music I	3
Materials and Techniques of Music II	3
One additional course in Materials and Techniques at the 20xxx level (MUS 20xxx, MUS 20xxx, etc.)	3
Music Histories and Cultures I	3
Music Histories and Cultures II	3
Introduction to Ethnomusicology	3
MUS Elective credits, 30xxx and above	12
MUS Elective credits, 10xxx and above	6
Ensemble Participation (2 semesters)	0
Music Total	36

PERFORMANCE CONCENTRATION

Class	Credits
Materials and Techniques of Music I	3
Materials and Techniques of Music II	3
One additional course in Materials and Techniques at the 20xxx level (MUS 20xxx, MUS 20xxx, etc.)	3
Music Histories and Cultures I	3
Music Histories and Cultures II	3
Introduction to Ethnomusicology	3
MUS Elective credits, 30xxx and above	6
MUS Elective credits, 10xxx and above OR additional applied lessons/ performance electives	3
Applied Lessons	10
Capstone	2
Ensemble Participation (4 semesters)	0
Music Total	39

MINOR IN MUSIC

Class	Credits
One of the following three courses: Music Theory Fundamentals; Materials and Techniques of Music I; Materials and Techniques of Music II	3
One of the following three courses: Music Histories and Cultures I; Music Histories and Cultures II; Introduction to Ethnomusicology	3
MUS Elective credits, 10xxx and above	3
MUS Elective credits, 30xxx and above	3
Applied Lessons or Ensemble participation	3
Additional MUS credits at any level (lessons, ensembles, electives, etc.)	3
Music Total	18

Honors in Music: Students of exceptional academic standing and/or artistic merit may be invited to pursue Honors in Music with the honors tracks corresponding to their respective concentration. Invited students must consult with their advisors about their Honors project.

ACADEMIC HONORS IN MUSIC

Additional MUS Elective credits, 30xxx+	3
Honors Thesis	3

HONORS IN MUSIC PERFORMANCE

Additional MUS Elective credits, 30xxx+	3
Additional Applied lessons/ performance electives	2
Honors Recital	1

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Music*. Course descriptions can be found by clicking on the subject code and course number in the search results.

To *Table of Contents*

Neuroscience and Behavior

Director of Undergraduate Studies:
Vanessa Chan-Devaere

Program of Studies. Neuroscience is a relatively young, exciting, and fundamentally interdisciplinary field devoted to the scientific study of the nervous system. Neuroscience encompasses the study of problems from multiple disciplinary perspectives at different levels of analysis in human and non-human organisms. It includes, for example, the study of molecular mechanisms in individual neurons and the coordination of millions of neurons into neural systems. Problems range from investigation of the evolution of nervous systems in basal vertebrates to the application of neuroscience to education and law. Neuroscientists also seek to develop neurologically plausible models of human thinking, affect and behavior.

Neuroscience creates a context for scholarly conversation about the nature of mind, brain and behavior. It engages experts in collaboration across diverse fields, including biological sciences, chemistry, computer science, engineering, linguistics, mathematics, medicine, philosophy, physics and psychology. Reflecting the interdisciplinary nature of the major, the curriculum includes flexibility such that it can be customized to best prepare students for a variety of future careers. Students studying neuroscience will be prepared to pursue professional degree programs (medical, dental, veterinary, clinical psychology, or other health professions) and graduate programs in areas such as neuroscience, biological sciences or psychology.

The requirements for the major are essentially the same, including three foundational neuroscience and behavior Core courses, and an introductory neuroscience and behavior laboratory course beginning the fall of the sophomore year. The tracks differ in how they fulfill college requirements. Required courses and electives for both the BS & BA that will satisfy the major credit requirements are drawn primarily from the Departments of Biological Sciences and Psychology. Undergraduate research and approved electives in other departments are also encouraged. This description covers the BA track only (see the College of Science section for the BS track).

Major Requirements. The Neuroscience and Behavior BA consists of 63 credits comprising 23 credits of prerequisite courses (some of these also fulfill university core requirements), 19 credits of Neuroscience and Behavior Core major courses, an additional 6 credits from the list of approved Disciplinary Specific electives, 3 more credits from the list of approved Integration/Application electives, and an additional 9 credits of approved NSBH coursework that can include a maximum of 6 credits of undergraduate research (with approved faculty advisors), and/or approved Supporting electives across several departments. See the undergraduate advisor for lists of approved courses and approved research advisors. Students should discuss their specific choices with the program's undergraduate adviser.

Major Prerequisites: ***(all courses required)***

Intro Psychology (Core 5)	3
MATH 10350/10550 (Core 1)	4
BIOS 10171/11173: Big Questions & Lab	4
BIOS 10172/11174: Molecules to Ecosystems & Lab	4
Gen CHEM 10171/11171 (Core 2)	4
Org CHEM 10172/11172 (Core 3)	4

Core Major Requirements: ***(all courses required)***

NSBH 20450: Systems Neuro w/lab (21450)	4
NSBH/PSY 30520: Intro to Cog Neuro	3
NSBH/CHEM 30301: Molecular Neuro	3
PSY 30100 Psychology Statistics	4
PSY 30160 Psychology Research Methods	4
NSBH 20010: Perspectives on the NSBH Major	1

All majors take an additional 6 credits from the list of approved Disciplinary Specific electives, 3 more credits from the list of approved Integration/Application electives, and an additional 9 credits of approved NSBH coursework that can include a maximum of 6 credits of undergraduate research

SAMPLE CURRICULUM:

The BA in Neuroscience and Behavior is flexible enough to allow students to spend a semester in their junior year studying abroad although this sample curriculum is not specific in this regard. This sample is simply intended as a general guide and curricular layout decisions should be made in conjunction with the Director of Undergraduate Studies.

BA 2024 (not pre-med) *Assumes no AP / language placement*

First Year Fall		**First Year Spring**	
Gen Chem 1 + lab	4	Orgo 1 + lab	4
Intro Bio 1 + lab	4	Intro Bio 2 + lab	4
Calculus 1	4	Intro Psych	3
Writing and Rhetoric	3	USEM (Liberal Arts 4 or 5)	3
Moreau First-Year Seminar	1	NSBH Prosem	1
	16		**15**
Sophomore Fall		**Sophomore Spring**	
NSBH Core 1	3	NSBH Core 2	3
CSEM	3	NSBH Core 3	3
Theology 1	3	Philosophy 1	3
Beginner Language 1	4	Statistics	4
NSBH Lab	1	Beginner Language 2	4
Elective	3		
	17		**17**
Junior Fall		**Junior Spring**	
NSBH Disciplinary Elective 1	3	NSBH Disciplinary Elective 2	3
Research Methods	4	NSBH Supporting Elective 1	3
Theology 2	3	Philosophy 2	3
Intermediate Language 1	3	Intermediate Language 2	3
Elective	3	Elective	3
	16		**15**
Senior Fall		**Senior Spring**	
NSBH Disciplinary Elective 3	3	NSBH Supporting Elective 2	3
NSBH Integration/Application Elective	3	NSBH Supporting Elective 3	3
History / Fine Arts / Literature	3	Elective	3
History / Fine Arts / Literature	3	Elective	3
Elective	3	Moreau Senior Capstone	1
	15		**13**

(with approved faculty advisors), and/or approved Supporting electives across several departments. See the undergraduate advisor for lists of approved courses and approved research advisors.

SENIOR THESIS

The Neuroscience and Behavior major offers senior Neuroscience and Behavior majors the option to complete a senior thesis that consists of a two semester sequence:

Prerequisite: To qualify for this track students need to be endorsed by a psychology faculty member.

Fall Semester: Student enrolls in the faculty advisor's section of PSY 47809 and participates in a series of self-organized workshops that provide/enable peer-review and support. Workshops would focus on introduction of topics/elevator pitches (September), peer-review of drafts of literature review and methods sections (October and November)

Spring Semester: Student enrolls in the faculty advisor's section of PSY 47809 and participates in a series of self-organized workshops that provide/enable peer-review and support. Workshops would focus on peer-review of results sections (February), peer-review of completed manuscripts (March), and practice for the symposium presentations (April).

Departmental Honors in Neuroscience and Behavior. The honors designation in psychology is awarded by completing the following:

Fall Semester: Achieving an A grade in PSY 47809 and a passing grade in PSY 40210 Advanced Statistics.

Spring Semester: Achieving an A grade in PSY 47809. A nomination by the faculty advisor and an evaluation of the thesis as worthy of the honors designation by a faculty committee.

COURSE DESCRIPTIONS

For a list of approved courses for this program, contact the Director of Undergraduate Studies in the College of Arts & Letters, Vanessa Chan-Devaere (tchan3@nd.edu), or the Director of Undergraduate Studies in the College of Science Nancy Michael, (nmichael@nd.edu). Courses associated with this academic program can be found online at https://neuroscienceandbehavior.nd.edu/about/curriculum/ and selecting the "BA Major Requirements" link. A list of elective options for the Disciplinary, Integration/Application, and Supporting Electives can be found under "List of Electives."

PREMED CONCENTRATION

In addition to the general BA, undergraduates interested in attending medical school have the option of completing a BA in Neuroscience and Behavior with a PreMed concentration. The PreMed concentration includes the requirements laid out above and also requires additional coursework laid out below:

Medical School Requirements Category:
(all courses required)

MATH 10360/10560	
Gen CHEM 20172/21172	4
Org CHEM 20173/21173	4
PHYS I 10310 & Lab (or 30210/31211 or 10411/11411 or 20210/21210)	4
PHYS II 10320 & Lab (or 20435/21435 or 30220/31220 or 20220/21220)	4
CHEM 40420	3

SAMPLE CURRICULUM:

BA 2024 (with pre-medical concentration) *Assumes no AP / language placement*

First Year Fall		**First Year Spring**	
General Chem 1 + lab	4	Organic Chem 1 + lab	4
Intro Bio 1 + lab	4	Intro Bio 2 + lab	4
Calculus 1	4	Calculus 2	4
Writing and Rhetoric	3	USEM (Liberal Arts 4 or 5)	3
Moreau First-Year Seminar	1	NSBH Prosem	1
	16		15
Sophomore Fall		Sophomore Spring	
NSBH Core 1	3	NSBH Core 2	3
CSEM	3	NSBH Core 3	3
Organic Chem 2 + lab	4	Philosophy 1	3
Beginner Language 1	4	Statistics	4
Intro Psych	3	General Chem 2 + lab	4
	17		17
Junior Fall		Junior Spring	
Physics 1 + lab	4	NSBH Disciplinary Elective 1	3
Research Methods	4	Physics 2 + lab	4
Beginner Language 2	4	Philosophy 2	3
Theology 1	3	Intermediate Language 1	3
NSBH Lab	1	NSBH Supporting Elective 1	3
	16		16
Senior Fall		Senior Spring	
NSBH Disciplinary Elective 2	3	NSBH Supporting Elective 2	3
NSBH Disciplinary Elective 3	3	NSBH Integration/Application Elective	3
Intermediate Language 2	3	NSBH Supporting Elective 3	3
Biochemistry	3	History / Fine Arts / Literature	3
History / Fine Arts / Literature	3	Theology 2	3
		Preparing for Health Professions	1
		Moreau Senior Capstone	1
	15		17

Philosophy

Chair:
Samuel Newlands
F.J. and H.M. O'Neill Professor of Science, Technology and Values:
Kristin Shrader-Frechette (emeritus)
McMahon-Hank Professors of Philosophy:
Karl Ameriks (emeritus); Patricia Blanchette; Daniel Nolan
Rev. John A. O'Brien Professors of Philosophy:
Robert Audi; Richard Cross; Alvin Plantinga (emeritus); Michael Rea
John Cardinal O'Hara Professor of Philosophy:
Peter Van Inwagen (emeritus)
George N. Shuster Professor of Philosophy:
Michael J. Loux (emeritus)
Wilsey Family College Professor of Philosophy:
Meghan Sullivan
Rev. John A. O'Brien Senior Research Professor:
Alasdair C. MacIntyre (emeritus)
O'Hara Professor of Philosophy and Mathematics:
Joel Hamkins
Rev. John A. O'Brien College Professor of Philosophy:
Sean Kelsey
John and Jean Oesterle Professor of Thomistic Studies:
Alfred Freddoso (emeritus)
John and Jean Oesterle Associate Professor of Thomistic Studies:
Therese Cory
Glynn Family Honors Professor of Philosophy:
Paul Weithman
William J. and Dorothy K. O'Neill Collegiate Professor of Philosophy:
Samuel Newlands
Thomas J. and Robert T. Rolfs Associate Professor of Philosophy:
Sara Bernstein
O'Neill Family Professor of Philosophy:
Jc Beall
Professors:
Sara Bernstein; Alix Cohen; Fred Dallmayr (emeritus); Cornelius F. Delaney (emeritus); Michael R. DePaul (emeritus); Stephen Dumont; John Finnis (concurrent); Thomas P. Flint (emeritus); Stephen Gersh (concurrent, emeritus); Vittorio Hösle (concurrent); Don A. Howard; Rev. John I. Jenkins, C.S.C.; Lynn Joy (emeritus); Janet A. Kourany; Edward Manier (emeritus); Kristopher McDaniels; Barbara Montero; G. Felicitas Munzel (concurrent); Robert Norton (concurrent); David O'Connor; Gretchen Reydams-Schils (concurrent); Mark Roche (concurrent); Fred Rush; Jeffrey Speaks; James P. Sterba; Ted A. Warfield; Stephen H. Watson (emeritus)
Associate Professors:
Timothy Bays; Brian Cutter; Curtis Franks; Vaughn R. McKim (emeritus); John O'Callaghan; Stephen Ogden; Blake Roeber; David Solomon (emeritus); Leopold Stubenberg (emeritus); Nicholas Teh
Assistant Professors:
Feraz Azhar; Zach Barnett; Laura Frances Callahan; Edward Elliot; Jessica Isserow; Michael Zhao
Professor of the Practice:
Alexander Jech
Associate Professor of the Practice:
Shane Duarte;
Associate Teaching Professor:
Joshua Seachris
Assistant Teaching Professors:
Paul Blaschko; Justin Christy; David Cory

Program of Studies. There are two ways to major in philosophy: The courses required for **regular philosophy majors** are distributed as follows: Either the two-course University Requirement, or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher; three specific core courses: a two-semester sequence in the history of philosophy, Ancient and Medieval Philosophy (PHIL 30301) and History of Modern Philosophy (PHIL 30302), and a course in formal logic (PHIL 30313; the logic requirement can also be fulfilled by PHIL 43907 or MATH 10130, but the latter does not count toward the classes required for the major: students taking it must take an additional elective); at least two seminars at the 4xxxx-level; and three electives at the 3xxxx- or 4xxxx-level.

Students pursuing a major in philosophy with a **concentration in Philosophy, Science, and Mathematics** follow an overlapping, but distinct, course of study. The courses required for a concentration in Philosophy, Science, and Mathematics are distributed as follows: Either the two-course University Requirement or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher; the Core Seminar in Philosophy, Science, and Mathematics (an intensive team-taught seminar offered every fall); a course in logic (PHIL 30313 Formal Logic or a more advanced option); a survey of the history of philosophy (either Ancient & Medieval Philosophy, PHIL 30301, or History of Modern Philosophy, PHIL 30302); two other upper-level philosophy courses, taught at the 3xxxx- or 4xxxx-level, at least one of which will be in the philosophy of science, philosophy of mathematics, or logic; and three majors-level electives in science or mathematics.

Students who are pursuing either a regular philosophy major, or the major with concentration in philosophy, science, and mathematics, may also elect to pursue the **Honors Track.** Honors philosophy majors complete all the requirements for the regular major and in addition write a senior thesis. Students writing the senior thesis enroll in PHIL 48499 Senior Thesis in both semesters of the senior year (the equivalent of two regular 3-hour seminars). To be eligible for the honors major, and thus for the senior thesis, a student must ordinarily maintain a GPA of 3.5 or above in courses in the major. Students considering the senior thesis are encouraged to have completed at least two of the three core courses (the two history surveys and formal logic) AND three 4xxxx-level seminars by the end of the junior year.

Students majoring in other departments may **take a minor in philosophy** by completing the following course of study: the two University Required Philosophy courses or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher; the two-course sequence in the history of philosophy (Ancient and Medieval Philosophy, PHIL 30301, and History of Modern Philosophy, PHIL 30302); one elective at the 3xxxx- or the 4xxxx-level; and one elective at the 4xxxx-level.

All 4xxxx-level philosophy courses are writing-intensive, requiring at least 20 pages of written work that may take various forms: reflections on readings, class presentations, or shorter or longer research papers. Students planning to go on to graduate studies in philosophy or related disciplines typically write a senior thesis as well.

PHILOSOPHY AND THEOLOGY JOINT MAJOR

Director:
Gabriel Reynolds, Theology
Faculty:
Additional faculty for the joint major are drawn from the departments of philosophy and theology.

Program of Studies. The joint major is intended for undergraduates who are intrigued by philosophical and theological ideas and who have an equal commitment to both disciplines. It seeks to equip such students to handle theology and philosophy adeptly. The major is structured, providing undergraduates with a suitable introduction to the study of both disciplines, but also flexible, granting students considerable scope for the pursuit of their own interests.

The joint major offers the opportunity for an informed investigation of religious and philosophical ideas and should appeal especially to those who intend to pursue graduate work in philosophy or theology.

The joint major incorporates the University requirements in the two departments and most of the formal requirements of the first majors in theology and philosophy. Students in the joint major will take the two-semester sequence in Christian Traditions and an upper-level course in Scripture. The joint major, however, does not require the one-credit proseminar in theology.

Other formal requirements are peculiar to the joint major. Students will study a classical language for two semesters. (For practical as well as pedagogical

reasons, this will normally be Greek.) Majors will also be expected to take one joint seminar. Led by a theologian and a philosopher, the joint seminars are offered every spring and will examine an issue in which the differing approaches of philosophy and theology may prove fruitful. The topic and instructors will change from year to year. Finally, each major will submit a senior thesis prepared under the direction of two advisors, drawn from each department. At the option of the directors, this thesis may be presented and discussed in an informal colloquium consisting of the other students in the joint major.

The remaining courses in the joint major will be at the discretion of the student. Normally taken at the 40xxx level, there should be an equal distribution in the electives between theology and philosophy. However, students who wish may devote up to six hours within the joint major to additional language work. These hours may add to the classical language previously studied, or used to begin another language of significance for philosophical and theological work.

The joint major differs from a first major in one discipline and a supplementary major in the other in that the latter requires 55 credit hours, whereas the joint major requires 60. Furthermore, the joint major calls for language instruction beyond what the University requires for all undergraduates. Finally, the joint seminars should prove especially challenging, inviting students to explore important topics in an interdisciplinary way. These features should make the joint major particularly attractive to students preparing for advanced study.

Requirements in Philosophy:
Either the two-course University Requirement, or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher.

PHIL 30301 and 30302. Ancient and Medieval Philosophy and History of Modern Philosophy.

PHIL 30313. Formal Logic.

Requirements in Theology:
THEO 10001, 10002, 10003 or 13183 (Foundations) and a 20000 (development level) course (University-required courses).

THEO 40201 and 40202. Christian Traditions I and II.

THEO 40101 or 40108. Upper-division scripture course.

Plus:
Classical language (normally Greek)—two semesters.

Joint seminar(s).

Senior thesis.

18 credit hours of electives (up to six of these may be additional hours in language study).

MINOR IN PHILOSOPHY, SCIENCE, AND MATHEMATICS

In many cases, conceptual or foundational questions about mathematics and science cannot be pursued in a responsible way without competence in the relevant scientific or mathematical discipline. For this reason, the minor in Philosophy, Science, and Mathematics is open only to students who have significant scientific and/or mathematical training. The minor requires students to take six courses: either the two-course University Requirement or (for students who took course in Catholicism Across the Disciplines in place of the 2nd University Requirement) the first University Requirement and an elective at 2xxxx-level or higher; the Core Seminar in Philosophy, Science, and Mathematics (offered every fall semester); three electives at the 3xxxx- or 4xxxx-level. (If a student has opted to take a Catholicism Across the Disciplines course instead of the second University Philosophy Requirement, then that student must take an extra elective at the 3xxxx- or 4xxxx-level.) At least one elective must be in the philosophy of science, philosophy of mathematics, logic, or the philosophy of logic. At least one elective must be at the 4xxxx-level.

Interested students should apply in the spring semester.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Philosophy*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Political Science

Chair:
Geoffrey C. Layman
Director of Graduate Studies:
Sebastian Rosato
Director of Undergraduate Studies:
Angela McCarthy
Associate Director of Undergraduate Studies:
Steven Landis
Eugene P. and Helen Conley Professor of Political Science:
Scott P. Mainwaring
Packey J. Dee Professor of American Democracy:
David E. Campbell
Packey J. Dee Professor of Political Science:
Dana Villa
Packey J Dee Professor of Political Science:
Michael C. Desch
Nancy Reeves Dreux Assistant Professor of Political Science:
Erin Rossiter
Andrew J. McKenna Family Professor:
Jeffrey Harden
Rev. Edmund P. Joyce, C.S.C., Professor of Africana Studies and Political Science:
Dianne Pinderhughes
Rev. Donald P. McNeill, C.S.C., Professor of Transformational Latino Leadership and Joseph and Elizabeth Robbie Professor of Political Science:
Luis R. Fraga
David A. Potenziani Memorial College Professor of Constitutional Studies:
Matthew E.K. Hall
Snyder Family Mission Professor:
Darren Davis
Teaching Professor:
Susan Pratt Rosato
Professors:
Michael J. Coppedge; Patrick Deneen; Rev. Robert A. Dowd, C.S.C.; Saad Gulzar; Eileen Hunt; Debra Javeline; Mary Keys; Geoffrey C. Layman; Vincent P. Muñoz; Joseph M. Parent; Aníbal Pérez-Liñán; Daniel Philpott; Emilia Justyna Powell; Sebastian Rosato; Guillermo Trejo; Christina Wolbrecht
Associate Professors:
Susan D. Collins; Eugene Gholz; Andrew C. Gould; Michael Hoffman; Victoria Hui; Karrie J. Koesel; Dan Lindley; Ricardo Ramirez; Susanne Wengle
Assistant Professors:
Christina Bambrick; Richard Clark; David Cortez; Rachel Porter; Luis Schiumerini; Jazmin Sierra
Associate Teaching Professors:
Angela McCarthy; Susan Pratt Rosato
Assistant Teaching Professor:
Steven Landis

Program of Studies. The political science major combines breadth and depth, helping students develop a general foundation for the study of politics and offering opportunities to explore particular

areas of interest. Courses give students both a strong knowledge base and facility with the tools of political analysis. The department offers a substantial number of courses in all four fields of the discipline—American politics, international relations, comparative politics, and political theory—covering a range of topics and analytical perspectives. The major can prepare students for a wide variety of vocations. After graduation, many students go to law school or graduate school, or work for service organizations, government, or business.

Requirements. The major requires a minimum of 11 courses:

- Political Theory (POLS 10600 or POLS 20600) in addition to a course in each of the other fields of political science: American Politics, International Relations, and Comparative Politics. One of these must be an introductory course. The other two can be introductory courses or intermediate-level courses.
- three intermediate-level courses: students may specialize in one field or take courses in a combination of fields that suits their interests.
- two writing seminars. Students should take one seminar by the end of their junior year. These seminars fulfill the Arts and Letters directive that all majors include a writing-intensive requirement.
- one methods course. Fulfilled by taking at least one entry-level methods course, which currently includes Quantitative Methods, Qualitative Methods, and Research Design and Methods. This course should be taken during the sophomore or first semester junior year.
- one-credit "Why Political Science" course. To get a better sense of the discipline, students will learn about the major fields in political science including American Politics, International Relations, Comparative Politics, and Political Theory. This course is also an opportunity for students to discern their academic and professional interests in political science.

Requirement Notes.

- *University Seminars do not count toward the major.*
- *AP credit does not satisfy a requirement or count toward the major.*
- *Junior and Senior Seminars do not fulfill the breadth requirements.*
- *Study Abroad: You can only count 6 study abroad credits toward the major.*

Department Tracks.
Students are encouraged to select a track as they complete their degree in political science. Students may select a track from among 4 fields of political science—American Politics, Political Theory, Comparative Politics, and International Relations.

Completion of a track involves passing:

- The field track's introductory course
- 3 intermediate level courses in that field

Senior Thesis. Students with a grade point average of 3.55 or above are encouraged to write a senior thesis. This two-semester project (POLS 58901 in Fall/ POLS 58902 in Spring) involves working closely with a faculty supervisor, and offers the opportunity to explore more deeply and independently a research project of the student's choice.

Pi Sigma Alpha. Students who have taken a minimum of four political science courses, with a grade no lower than a B in their political science courses, and who are on the Dean's List are eligible to join Notre Dame's chapter of Pi Sigma Alpha, the national honor society for political science majors.

Graduate Courses
Many graduate courses are open to qualified undergraduates by permission.

Departmental Honors in Political Science
The honors track in political science does not involve additional political science courses, but is designed to encourage students to make better use of their courses both within and outside the major, and prepare them for research in their senior year, and advanced study and work after graduation.

To graduate with departmental honors, a student must:

Graduate with a cumulative grade point average of 3.55 or higher.

Complete two semesters of senior thesis work with a grade of B+ or higher.

Students writing a theory thesis will take at least one theory course beyond Introduction to Political Theory.

Students writing an empirical thesis will take a second methods course, of their choice.

Political Methodology Specialization Requirements
Four courses are required in the methodology curriculum:

- Two core classes in methodology:
  - Qualitative Political Analysis
  - Quantitative Political Analysis
- Two electives (below is a list of recent offerings):
  - POLS 30815: Designing and Analyzing Public Opinion Surveys
  - POLS 40815: Visualizing Politics
  - Other courses are subject to approval. Email the Director of Undergraduate Studies for details.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Political Science***

Course descriptions can be found by clicking on the subject code and course number in the search results. You can also search for classes using the course attribute codes: American Politics: POAM; International Relations: POIR; Comparative Politics: POCP; Political Theory: POTH; Political Methods: POME.

Program of Liberal Studies

Chair:
Christopher Chowrimootoo
Rev. John J. Cavanaugh, C.S.C., Professors of Humanities:
Stephen M. Fallon (emeritus); Michael J. Crowe (emeritus)
Michael P. Grace II, Professor of Arts & Letters:
Gretchen Reydams-Schils
Professors:
Rev. Nicholas Ayo, C.S.C. (emeritus); Kent Emery Jr. (emeritus); Julia Marvin (emeritus); G. Felicitas Munzel; Walter J. Nicgorski (emeritus); F. Clark Power (emeritus); Andrew Radde-Gallwitz; Gretchen Reydams-Schils; Phillip R. Sloan (emeritus); Henry M. Weinfield (emeritus)
Associate Professors:
Francesca Bordogna; Katie Ann-Marie Bugyis; Christopher Chowrimootoo; Jennifer Newsome Martin; Denis Robichaud; Arman Schwartz; Joseph Rosenberg
Assistant Professors:
Emma Planinc; Matthew Rickard

Program of Studies. The Program of Liberal Studies, Notre Dame's Great Books program, offers an integrated three-year sequence of studies leading to the Bachelor of Arts degree.

Fundamental to the Program is a conception of a liberal arts education that aims to avoid the separation of the humanities into isolated disciplines. The Program seeks to provide a unified undergraduate education in all of the liberal arts, including music and the natural sciences. For this reason, the Program is not to be equated with a "general humanities" educational Program. The study of literature, philosophy, natural and social science, theology, history, and the fine arts will take place within a larger unifying conception of the liberal arts that cuts across many of the disciplinary boundaries suggested by these terms. Because the goal of the Program is to provide more than an introduction to various subject matters, none of the tutorials or seminars stands alone in the Program. The curriculum grows organically over the three years, with each course presuming all of its predecessors.

Although the Program provides education in the liberal arts, it also considers the liberal arts in themselves as insufficient for a complete education. The liberal arts are the critical tools of learning, but they are also to be related to the larger search for genuine understanding and philosophic wisdom. Philosophy, which explores the basic questions of epistemology, ethics, and politics, is also related to the claims of the Christian tradition. The Program maintains specific tutorials in the various disciplines to enable the relationships among them to develop systematically and also to foster a concern with what unifies or transcends them.

The normal method of instruction in the Program is through the reading and discussion of primary texts. The student is asked to take an active role in the learning process. Particularly in the seminar, the authors of the great books are considered to be the primary teachers.

The Program requires writing throughout the curriculum, especially in the tutorial classes. In the final year, all students have the option to write a senior thesis, usually involving extensive research, under the direction of a faculty advisor. The senior thesis offers students a particularly intensive writing experience and an opportunity to investigate in depth a specialized topic of interest.

Despite the Program's 68-credit curriculum, Program students may carry second majors, supplementary majors, minors, and concentrations, and they may participate in study abroad programs. When necessary, students may satisfy a limited number of Program requirements by taking non-departmental courses with comparable content. Such exemptions are granted only with the permission of the Program's Director of Undergraduate Studies and are subject to strict limitations.

Students normally declare a PLS major by the beginning of April of the first year. Declaration of major forms are available by early March in the department office (320 O'Shaughnessy) and website (pls.nd.edu). Students interested in entering the Program are urged to complete the University science and mathematics requirements in the first year. Students may join the Program after the beginning of the sophomore year, although this requires one to make up one or more courses.

SEQUENCE OF COURSES

Sophomore Year

First Semester

20201. Literature I: The Lyric Poem	3
20301. Philosophical Inquiry	3
23101. Great Books Seminar I	4
Elective	3
Elective	3
	16

Second Semester

20302. Bible and Its Interpretation	3
20412. Fundamental Concepts of Natural Science	3
23102. Great Books Seminar II	4
Elective	3
Elective	3
	16

Junior Year

First Semester

30301. Ethics	3
30412. Scientific Inquiry: Past and Present	3
30501. Music and Meaning	3
33101. Great Books Seminar III	4
Elective	3
	16

Second Semester

30202. Literature II: Shakespeare and Milton	3
30302. Political and Social Theory	3
33102. Great Books Seminar IV	4
Elective	3
Elective	3
	16

Senior Year

First Semester

40301. Christian Theological Traditions	3
40601. Intellectual and Cultural History	3
43101. Great Books Seminar V	4
48701. Essay Tutorial	3
Elective	3
	16

Second Semester

40302. Metaphysics and Epistemology	3
40412. Science, Society, and the Human Person	3
43102. Great Books Seminar VI	4
48702. Essay Tutorial	2
Elective	3
	15

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Program of Liberal Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Psychology

Chair:
James Brockmole
Associate Chair:
Laura Miller-Graf
Director of Graduate Studies:
G.A. Radvansky
Director of Undergraduate Studies:
Joshua John Diehl
Notre Dame Chair in Psychology:
E. Mark Cummings
Professors:
Cindy Bergeman; James Brockmole; Ying (Alison) Cheng; Bradley S. Gibson; Dawn M. Gondoli; Nicole McNeil; Laura Miller-Graff; Jessica Payne; G.A. Radvansky; David A. Smith; Kristin Valentino; Lijuan (Peggy) Wang; Ke-Hai Yuan; Zhiyong (Johnny) Zhang
Associate Professors:
Kathleen Eberhard; Oscar Gonzalez; Gerald Haeffel; Guangjian Zhang
Assistant Professors:
Ryan Carpenter; Caitlin Clements; Haya Fatimah; Alexis Georgeson; Kaylin Hill; Jenny Padilla; Matthew Robison; Elizabeth Shewark; Ivan Vargas
Assistant Research Professors:
Kathleen Bergman; Michelle Luna; Michael Villano
Associate Clinical Professor:
Jennifer Hames
Assistant Clinical Professors:
Taylor Nicoletti; Nina Stoeckel
Assistant Teaching Professors:
Vanessa Chan; Jordyn Wilcox
Associate Teaching Professor:
Joshua John Diehl

BACHELOR OF ARTS IN PSYCHOLOGY

Program of Studies. Psychology is the scientific study of the behavior of organisms with a primary focus on human behavior. It is concerned with the biological and environmental determinants of behavior as reflected in the study of physiological, sensory, perceptual, cognitive, motivational, learning, developmental, aging, and social processes. The undergraduate program seeks a balance between exposure to basic psychological principles and theories and their extension to the applied areas such as child education, counseling, mental retardation, and behavioral deviancy.

The undergraduate courses are intended to meet the needs of students who plan to (1) major in psychology and later attend graduate school in psychology or affiliated fields, (2) major in psychology as part of a general cultural program, (3) obtain training in psychology as a special supplement to their major interest or (4) use psychology to satisfy social science requirements or electives.

One of the department's main features is an emphasis on opportunities for close faculty-student involvement in research projects at the undergraduate level. The research specialties in which majors may become involved range from basic research in such areas as psychophysics, human and animal learning, child development, aging, and psycholinguistics, to applied research in a community setting. Students planning to do graduate work in psychology will plan their program in close coordination with their faculty advisors.

Major Requirements. All majors are required to take the Introductory Psychology Course (3 credits from either PSY 10000 for first year students or PSY 20000 for upper-class students).). This course serves as a prerequisite or corequisite for the Psychology Major courses, even for those students who have completed the AP Psychology exam regardless of their score on the exam. The specific major requirements are as follows:

Required Courses:
***9 credit hours*—**exception: APH2 supplementary majors are not required to take PSY 20010

PSY 20010. Psychology: Science, Practice & Policy	1
PSY 30100. Statistics for Behavioral Sciences	4
PSY 30160. Research Methods for Behavioral Sciences	4

30000 Content Area Courses:
A minimum of 2 courses (6 credits) from each of the following categories ***(total of 12 credits minimum)***

Class A Courses

PSY 30200. Developmental Psychology	3
PSY 30220. Adolescent Development	3
PSY 30300. Personality Psychology	3
PSY 30310. Abnormal Psychology	3
PSY 30312. Child & Adolescent Psychopathology	3
PSY 30314. Introduction to Clinical Psychology	3
PSY 30600. Social Psychology	3
PSY 30634. Psychology of Peace	3

Class B Courses

PSY 30253. An Introduction to Cognitive Development	3
PSY 30312. Cognitive Aging	3
PSY 30400. Cognitive Psychology	3
PSY 30430. Learning & Memory	3
PSY 30440. Sensation & Perception	3
PSY 30510. Behavioral Genetics	3
PSY 30520. Introduction to Cognitive Neuroscience	3

40000 Senior Seminar Courses:
A minimum of 2 courses (6 credits) from this category. These are small, in-depth discussion-oriented seminars generally in the instructor's specific area of expertise and the options may vary from semester to semester or year to year. The Methods for Behavioral Sciences course and all 40000 level seminars are designated writing-intensive courses, satisfying the College of Arts and Letters writing requirement. (See the introductory portion of the Arts and Letters section.)

Note:

- *Introductory Psychology does not fulfill any of the 30-credit-hour requirements for the major.*
- *PSY 27800 Research Lab credits are strongly recommended for any students' intent on pursuing a graduate career in psychology.*
- *In some cases students for whom psychology is their second major may complete another statistics course (ITAO 20200; ECON 30330 or BIOS 40411) in place of the PSY 30100 course. However, these students will be required to complete an additional psychology course (from the 30000 or 40000 level categories) to complete the requisite number of psychology courses to graduate with the major.*

SENIOR THESIS

The psychology major offers senior psychology majors the option to complete a senior thesis that consists of a two semester sequence:

Prerequisite. To qualify for this track students need to be endorsed by a psychology faculty member.

Fall Semester: Student enrolls in the faculty advisor's section of PSY 47809 and participates in a series of self-organized workshops that provide/enable peer-review and support. Workshops would focus on introduction of topics/elevator pitches (September), peer-review of drafts of literature review and methods sections (October and November)

Spring Semester: Student enrolls in the faculty advisor's section of PSY 47809 and participates in a series of self-organized workshops that provide/enable peer-review and support. Workshops would focus on peer-review of results sections (February), peer-review of completed manuscripts (March), and practice for the symposium presentations (April).

Departmental Honors in Psychology. The honors designation in psychology is awarded by completing the following:

Fall Semester: Achieving an A grade in PSY 47809 and a passing grade in PSY 40210 Advanced Statistics.

Spring Semester: Achieving an A grade in PSY 47809. A nomination by the faculty advisor and an evaluation of the thesis as worthy of the honors designation by a faculty committee.

Psi Chi Honors Society. Psychology majors in their senior year whose cumulative GPA places them in the top 35% of their graduating class qualify for induction into the Notre Dame Chapter of the Psi Chi National Honors Society. The department undertakes a membership drive in the beginning of the spring semester and invites major seniors who qualify to join the society.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Psychology*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Romance Languages and Literatures

Chair:
Alison Rice
Director of Graduate Studies in Italian:
Theodore J. Cachey Jr.
Director of Graduate Studies in Spanish:
Vanesa Miseres
Director of Undergraduate Studies:
Keith Schaefer
Graduate Liaison of French
Fr. Gregory Haake
Associate Directors of Undergraduate Studies:
French—Claire Reising
Italian—Kathleen Boyle
Portuguese—Marcio Bahia
Spanish—Katherine Oswald
Professors:
Thomas F. Anderson; Theodore J. Cachey Jr.; Joshua Lund; Marisel C. Moreno; María Rosa Olivera-Williams; Alison Rice
Associate Professors:
Fr. Gregory Haake; Ben Heller; Carlos Jáuregui; Charles Leavitt; Vanesa Miseres; Juan Vitulli
Assistant Professors:
Pedro Aguilera-Mellado; Laura Banella; Sara Boezio; Madison Mainwaring; Johannes Junge Ruhland
Teaching Professors:
Alessia Blad-Miller; Tatiana Botero; Kathleen Boyle; Elena Mangione-Lora; Rachel Parroquin; Tiziana Serafini; Shauna Williams
Associate Teaching Professors and Concurrent Lecturers:
María Coloma; Marcio Bahia; Monica Jancha; Katherine Oswald; Andrea Topash Ríos; Anne Schaefer; Patrick Vivirito
Assistant Teaching Professors and Concurrent Lecturers:
Ana Fauri; Azeb Haileselassie; Lesley Marcantonio; Claire Reising; Keith Schaefer

Program of Studies. The Romance languages derive from Vulgar Latin spoken throughout the Roman Empire. A major course of study is offered in French, Italian, and Spanish. Minors are offered in French, Italian, and Portuguese. The study of languages, literatures, and cultures provides educational opportunities relevant to an increasingly interdependent world. A crucial component of a liberal education, the acquisition of language skills enhances our powers of communication and serves to introduce us to the enduring cultural achievements of other peoples. Moreover, the study of languages, literatures, and cultures broadens our mental horizons, encourages us to think and act more globally, and stimulates our understanding of the traditions of other people. Elementary and intermediate courses develop the students' ability to understand, speak, read, and write French, Italian, Portuguese, or Spanish language with facility and confidence.

Upper-division courses present a wealth of literary, historical, and cultural traditions and emphasize the nature and development of cultures. Many courses focus on the literature and culture of certain historical periods. Others trace the development of literary genres or examine a theme across periods and genres. All courses inculcate the critical and analytical skills necessary for an informed interpretation of texts. Participation in Notre Dame's international study programs in Brazil, Chile, France, Italy, Mexico, and Spain (see the International Study Programs section of this *Bulletin*) is highly recommended although not required to pursue a major in Romance languages and literatures. Majors and supplementary majors in French, Italian, and Spanish must complete 50 percent of their credit hours in the major in residency at Notre Dame and meet the following program requirements. For current information visit the department website: http://romancelanguages.nd.edu/.

PROGRAM IN FRENCH AND FRANCOPHONE STUDIES

The Major in French and Francophone Studies
The requirements for a major in French and Francophone Studies consist of successful completion of 10 courses that total at least 30 credits beginning at or above ROFR 20202. Of these 10 courses, three courses must be at the 40xxx level, at least one course must focus on the period before 1800, and at least one course on the period after 1800. At least half must be taken in residence at Notre Dame. Required among these 10 courses is ROFR 30310 (The Art of Interpretation), which must be completed by the end of junior year. ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged, though not required. AP credit may not be applied to the major. Any substitutions or exceptions to the above program requires DUS approval. Faculty in the Program in French and Francophone Studies are glad to serve as directors to students seeking to write a senior thesis. The thesis can be either in the French and Francophone Studies, International Economics, or Romance Languages major and can be written in English or in French. Interested students should contact the DUS or Associate DUS in French by Oct. 15th of their senior year. Students wishing to write a senior thesis should sign up for ROFR 48000 the spring of their senior year. The senior thesis is completed in addition to the 10 courses totaling at least 30 credits for the major.

The Minor in French and Francophone Studies
The requirements for a minor in French and Francophone Studies consist of successful completion of 5 courses that total at least 15 credits beginning at or above ROFR 20202. Of these five courses, one course must be at the 40xxx level and must be taken in residence at Notre Dame. Overall, at least half of the minor courses must be taken in residence at Notre Dame. Required among the five courses is ROFR 30310 (Art of Interpretation). Any substitutions or exceptions to the above program requires DUS approval. AP credits may not be applied to the minor.

The Supplementary Major in French and Francophone Studies
The requirements for a supplementary major in French and Francophone Studies consist of successful completion of 8 courses that total at least 24 credit hours beginning at or above ROFR 20202. Of these eight courses, two must be at the 40xxx level, at least one must focus on the period before 1800, and at least one course on the period after 1800. At least half must be taken in residence at Notre Dame. Required among these eight courses is ROFR 30310 (The Art of Interpretation), which must be completed by the end of junior year. ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged, though not required. Any substitutions or exceptions to the above program requires DUS approval. AP credit may not be applied to the supplementary major.

The Honors Track
The requirements for the honors track major consist of successful completion of 11 courses that total at least 33 credits beginning at or above ROFR 20202. In addition to the requirements for the major, honors track students must complete an eleventh course at the graduate level with a grade of A– or higher, in which they will write a substantive research paper, normally in French, which constitutes the honors thesis. By invitation only, highly motivated students may consider the option of taking the semester-long directed Honors Thesis (ROFR 58000) as the eleventh course, completing an honors thesis under faculty direction. French majors are admitted to the honors track by invitation, although qualified students may petition for admission in the first semester of their senior year. To be eligible for the honors track, students must be first majors with a minimum GPA of 3.7 in French and have completed at least seven courses toward the major by the end of their junior year. They must also receive the written support of a professor in a course at the ROFR 30xxx level or higher. For full consideration, students should contact the DUS of the Department of Romance Languages and Literatures or the Associate DUS in French no later than October 15th of their senior year. In order to graduate with honors, students admitted to the honors track should maintain a minimum GPA of 3.7 in French.

Combined B.A./M.A. Program in French 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 during the normal four-year undergraduate period, followed by a total of 30 credit hours of graduate courses taken during the fourth and fifth years of residence. Six credit hours can be counted toward both the undergraduate and graduate degrees. During their senior year, participants in this program take two graduate courses, take the qualifying exam given to all first-year graduate students, and apply to the Graduate School for admission during the

Spring semester. B.A./M.A. students are eligible for a teaching fellowship during their fifth year that includes a tuition waiver and a teaching stipend. Well-qualified students who are interested in this program should contact the Director of Graduate Studies in the Department of Romance Languages and Literatures and/or the graduate liaison in French at the beginning of their junior year.

PROGRAM IN ITALIAN LITERATURE AND CULTURE

The undergraduate program in Italian offers a major, a supplementary major, and an honors track major in each of two possible concentrations: (1) Italian literature and culture; (2) Italian Studies. In addition, the program also offers (3) a minor in Italian, as well as the opportunity to focus on Italian through (4) the Romance Languages major or (5) the International Economics major (discussed separately in the *Bulletin*). The Italian program does not cap double-counting from other requirements.

(1) Literature and Culture Concentration

The Major in Italian: Literature and Culture Concentration
The major in Italian with a concentration in literature and culture requires 10 courses that total at least 30 credits beginning at the 20000 level or above, including no more than two 20000-level courses (ROIT 20201 and ROIT 20202 count as two courses for the major; ROIT 20111 counts as one course toward the major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of five elective ROIT courses in Italian literature or culture at the 30000 or 40000 level or above. ROIT 30310 (Passage to Italy) is recommended for all majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Students wishing to write a senior thesis should sign up for ROIT 48000 the spring of their senior year. The senior thesis is completed in addition to the 10 courses totaling at least 30 credits for the major. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Supplementary Major in Italian: Literature and Culture Concentration
Supplementary majors in Italian with a concentration in literature and culture are expected to demonstrate competency in the language and to complete 8 courses that total at least 24 credits beginning at the 20xxx level or above, including no more than two 20xxx-level courses (ROIT 20201 and ROIT 20202 count as two courses for the supplementary major; ROIT 20111 counts as one course toward the supplementary major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of three elective ROIT courses in Italian literature or culture at the 30xxx or 40xxx level or above. ROIT 30310 (Passage to Italy) is recommended for all supplementary majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Honors Track Major in Italian: Literature and Culture Concentration
The honors track major in Italian with a concentration in literature and culture consists of 11 courses that total at least 33 credits, including all the requirements for the major, a GPA in the major of at least 3.7, plus a substantial final essay, to be written in Italian for a graduate course or for ROIT 58000, Honors Thesis Direction, which will constitute the 11th course. All honors track majors should enroll in ROIT 53000 Italian Seminar in the fall semester of the year they write their thesis. Interested students should contact the DUS or Associate DUS in Italian by October 15th of their senior year.

(2) Italian Studies Concentration

The Major in Italian: Italian Studies Concentration
The major in Italian with a concentration in Italian Studies requires 10 courses that total at least 30 credits beginning at the 20000 level or above, to be chosen as follows: Five courses must be ROIT courses in Italian language, literature, and culture and taught in Italian, including at least one of ROIT 30711 (Medieval-Renaissance Italian Literature and Culture) or ROIT 30721 (Modern Italian Literature and Culture), and one course at the 40000 level or above. No more than two of these five courses may be at the 20000 level (ROIT 20201 and ROIT 20202 count as two courses for the major; ROIT 20111 counts as one course for the major). The other five courses must be on Italian subjects or strictly relevant to Italian culture, and together they must not be drawn from more than three disciplines or departments, such as history, art history, classics, FTT, music, or political science (the courses may of course be listed under ROIT). Four of these five courses must be at the 30000 level or above, and include at least one course at the 40000 level or above; no more than one of the five may be at the 20000 level. In order to create a coherent program, the selection of courses must be approved by the Associate DUS in Italian (or committee, if appropriate). Equivalent courses from foreign study programs or other universities may be substituted by permission. Students wishing to write a senior thesis should sign up for ROIT 48000 the spring of their senior year. The senior thesis is completed in addition to the 10 courses totaling at least 30 credits for the major. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Supplementary Major in Italian: Italian Studies Concentration
The supplementary major in Italian with a concentration in Italian Studies requires 8 courses that total at least 24 credits beginning at the 20000 level or above, to be chosen as follows: Four courses must be ROIT courses in Italian language, literature, and culture and taught in Italian, including no more than two courses at the 20000 level. The other four courses must be on Italian subjects or strictly relevant to Italian culture, and must not be drawn from more than three disciplines or departments, such as history, art history, classics, FTT, music, or political science (the courses may of course be listed under ROIT). Three of these four courses must be at the 30000 level or above; no more than one may be at the 20000 level. In order to create a coherent program, the selection of courses must be approved by the Associate DUS in Italian (or committee, if appropriate). Equivalent courses from study abroad programs or other universities may be substituted by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

The Honors Track Major in Italian: Italian Studies Concentration
The honors track major with a concentration in Italian Studies consists of 33 credits or 11 courses, including all the requirements for the major in Italian with a concentration in Italian Studies, a GPA in the major of at least 3.7, plus a substantial final essay, to be written for a graduate course or for ROIT 58000, Honors Thesis Direction, which will constitute the 11th course. The course or topic will be selected in consultation with the student's advisory committee for the major. All honors track majors should enroll in ROIT 53000 Italian Seminar in the fall semester of the year they write their thesis. Interested students should contact the DUS or Associate DUS in Italian by October 15th of their senior year.

(3) The Minor in Italian

The minor in Italian comprises 5 courses that total at least 15 credits beginning at the 20000 level or above, including at least three courses at the 30000 or 40000 level. Three of the five courses must be ROIT courses in Italian language, literature, and culture, and taught in Italian; the fourth and fifth courses may be on Italian literature and culture taught in English or with texts in translation, or may be courses on Italian subjects originating in other

disciplines or departments (for example, LLRO, art history, architecture, or history). Courses from study abroad programs or other universities may be substituted by permission, but at least two courses for the Italian minor must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

PROGRAM IN IBERIAN AND LATIN AMERICAN STUDIES

All majors and supplementary majors in Spanish are required to take core courses consisting of ROSP 30310 (Introduction to Hispanic Literature and Cultures) and 3 courses in advanced literature and culture (numbered 30710 and above). AP credit may not be applied toward the major.

The Major in Spanish
The major in Spanish requires 10 courses that total at least 30 credits beginning at 20202 or above, including the required core courses described above, two 40000-level courses, and the Senior Seminar. Equivalent literature and culture courses from international study abroad programs or other universities may be substituted with departmental approval. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

Students are allowed to take one related course in English outside of the Department of Romance Languages and Literatures (for example, Colonial Latin American History, taken in the History Department) or one course in Spanish outside of the discipline of literature and culture (for example, a theology course taken in Spanish in a study abroad program), with the approval of the DUS or Associate DUS in Spanish.

The Supplementary Major in Spanish
Supplementary majors in Spanish are required to complete 8 courses that total at least 24 credits beginning at 20202 or above, including the required core courses described above and one 40000-level course. Equivalent literature and culture courses from international study abroad programs or other universities may be substituted with departmental approval. Fifty percent of the credits for the supplementary major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

Students are allowed to take one related course in English outside of the Department of Romance Languages and Literatures (for example, Colonial Latin American History, taken in the History Department) or one course in Spanish outside of the discipline of literature and culture (for example, a theology course taken in Spanish in a study abroad program), with the approval of the DUS or Associate DUS in Spanish.

The Honors Track in Spanish
The honors track major consists of the general requirements for the major (10 courses that total at least 30 credits) plus 3 extra credits which may be completed in one of two ways. First, after taking the Senior Research Seminar the student may take a semester-long Honors Thesis tutorial in the spring as the 11th course, completing an honors thesis under faculty direction. Or, second, the student may take an 11th course at the graduate level, in which they must complete a substantial research paper and receive a grade of A– or higher to graduate with honors.

Spanish majors are admitted to the honors track by invitation, although qualified students may petition for admission. To be eligible for the honors track, students must be first majors with a minimum GPA of 3.7 in Spanish and at least seven courses toward the major. Interested students should contact the DUS or Associate DUS in Spanish by October 15th of their senior year.

Senior Thesis
We encourage all majors to write a thesis. During your senior year, you will register in the FALL for the Senior Seminar (ROSP 53000), conducted in the target language, and during this time you will choose your thesis topic and begin to develop the thesis. In the spring semester, you will register for the independent study course designated as senior thesis in order to complete your thesis under the direction of your supervising professor. The senior thesis is completed in addition to the 10 courses totaling at least 30 credits for the major.

What is the senior thesis?
The senior thesis is a written capstone project that typically involves a significant research component, but the emphasis is still on original thought. Regardless of the nature of the project, the senior thesis might best be viewed as an extended essay. In formulating, researching, and writing the thesis, students majoring in Spanish will work one-on-one with a thesis director.

Your thesis will be a written document of approximately 40 pages in length. The thesis may be written in English or Spanish.

Students planning to write a senior or honors thesis for their Spanish major must:
- Communicate their interest in writing a senior thesis by October 15th of the student's senior year
- Complete at least an outline and a bibliography for the project during the fall semester while taking the Senior Seminar; for many students the paper required for completion of the Senior Seminar will form part of the final thesis
- The second semester of the senior year must be devoted to completing the writing or the project work, and a full draft of the thesis or project must be submitted to the advisor by March 15th
- The final, complete version of the thesis or project must be submitted by April 12th. Students should submit one copy to their faculty thesis advisor and one electronic and one hard copy to the department.

The Combined B.A./M.A. Program in Spanish
The Department of Romance Languages and Literatures offers its majors in Spanish the opportunity to participate in its graduate program through a combination B.A./M.A. degree in Spanish. This accelerated program requires students to take 30 credit hours 20202 and 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 of residence. Six credit hours can be counted toward both the undergraduate and graduate degrees. During their senior year, participants in this program take two graduate courses, applying to the Graduate School for admission during the spring semester. During their fifth year, B.A./M.A. students are eligible for a teaching fellowship, which includes a tuition waiver and a generous teaching stipend. Students should have a strong academic record and should have made substantial progress toward their Spanish major by the second semester of their junior year. It is imperative that students interested in this program contact the director of Graduate Studies and/or the graduate coordinator in Spanish at the beginning of their junior year.

Minor in Portuguese
The minor in Portuguese and Brazilian Studies consists of 15 credits, five courses, 3 credits each. Prerequisites are ROPO 10101 and 10102, or 10103 and 10104, or 10105 and 10106. Requirements include five courses in Portuguese language and Luso-Brazilian literature beyond the prerequisites, ROPO 20201 and 20202, and three additional courses at the 30000/40000 level. Three of the five courses must be in Portuguese language and/or Luso-Brazilian literature, film, and culture taught in Portuguese; the fourth and fifth courses may be on Luso-Brazilian literature, film, and culture taught in English. The fourth and fifth courses may also be on a Portuguese or Brazilian subject in another discipline (for example, anthropology, history, FTT, political science, Romance languages and literatures, theology, etc.). Courses from study abroad programs or other universities may be substituted by permission, but at least three courses for the Portuguese minor must be taken in residence at Notre Dame. AP credit may not be applied toward the minor.

Interdisciplinary Minors
Spanish majors are encouraged to pursue allied courses offered through other interdisciplinary minors. Spanish courses offer a particularly appropriate complement to the Latino Studies and European Studies programs. See the section on Interdisciplinary Minors in this *Bulletin* for more details. Majors may also apply one senior-level ROPO course in Luso-Brazilian culture and literature toward their elective credits.

MAJOR IN ROMANCE LANGUAGES AND LITERATURES

The undergraduate major in Romance Languages and Literatures is designed for qualified students who wish to major in two programs (French, Italian, or Spanish). Cross-cultural in focus, the major recognizes the importance of studying the correspondences and differences among various Romance literatures and cultures and of reexamining traditional disciplinary boundaries. The requirements for a major in Romance languages and literatures include competency in two languages and successful completion of 12 courses that total at least 36 credit hours, which must be distributed equally between the two respective language programs as follows:

(1) Two area courses in each language and literature program (French or Italian); Spanish requires 2 core courses numbered 30710 or above;

(2) 30310 in one program;

(3) Two 40xxx-level courses in each program;

(4) One Senior Seminar (530000) in one program;

(5) One elective course at the 20202 or above level, one in each program (any exception requires permission from the DUS).

The Honors Track in Romance Languages and Literatures
To be eligible for the honors track, students in Romance Languages and Literatures must be first majors with a minimum GPA of 3.7 in the major, and will have completed at least eight courses toward the major. It is strongly recommended that students take at least one 40000-level class in the major at Notre Dame by the end of their junior year. In addition to the general requirements for the major, honors track students will maintain a 3.7 GPA in the major through graduation and complete one graduate-level course in one of the Romance languages with a grade of A– or higher. Highly motivated students who have already been accepted to the honors track may be invited to complete an honors thesis in lieu of taking the graduate course. The honors thesis option must be carried out under the direction of a department faculty member, in the area of specialization. Students will identify the professor with whom he or she intends to work, obtain approval of the topic, and Director of Undergraduate Studies by October 15th of the student's senior year. Students are also encouraged to take at least one course that addresses cultural or literary theoretical questions and readings; this course may be a 40000-level course offered in the Department of Romance Languages, or a similar course in a related field (English, gender studies, FTT, philosophy, sociology, etc.). Romance Languages and Literatures majors are admitted to the honors track by invitation, although qualified students may petition for admission. Applications for eligible seniors will be accepted through October 15th of their senior year.

Senior Thesis
Faculty in the respective programs are glad to serve as directors for students seeking to write a senior thesis. The thesis can be written in English or in the target language. Interested students should make contact with the DUS during the fall semester of their senior year.

Placement in Language Courses
For French and Spanish, there is an online placement exam for students who have not already demonstrated language proficiency through national standardized testing, such as the AP or Achievement tests. Students with previous experience are required to take one of these tests before enrolling in their first course in those languages. For Italian or Portuguese placement, please contact the Director of Undergraduate Studies. The normal prerequisite for a 30xxx-level course is at least one 20202 or above level course. The normal prerequisite for a 40xxx-level course is at least one 30xxx-level course or permission of the instructor.

Policy Regarding Romance Language Placement Examination
The placement examination is designed to place each student at an appropriate level within a language sequence. Obtain placement examination information from the Director of Undergraduate Studies in the Department of Romance Languages and Literatures.

MAJOR IN INTERNATIONAL ECONOMICS & ROMANCE LANGUAGES

The undergraduate major in International Economics is a collaborative effort between the Department of Economics and the Department of Romance Languages and Literatures. In pursuing this major, students take a minimum of eight economics courses and at least five intermediate and advanced courses in French, Italian, Portuguese, or Spanish. Students are also required to enroll in a one-credit course "Exploring International Economics" designed to foster the integration of the study of culture with the study of economics. Students must also complete a senior research project or equivalent designed to integrate their economic and language and culture study. The senior research project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a Romance language.

Students must complete a constellation of five to six language, culture, and literature courses starting at the intermediate level or above; at least two courses at the 40000 level (one may be taught in English); "Exploring International Economics" (briefly described above); and the Senior Research Project (ECON 48100). Information on Economics requirements can be found on the Department of Economics webpage (https://economics.nd.edu/undergraduate-program/academic-programs/international-economics-major/).

Through the major, the collaborating departments seek to blend two programs of study to ensure that students will achieve advanced linguistic and cultural competency in a modern language as well as excellent preparation in Economics. The balance of economics with languages and culture courses should attract motivated students and inspire them to undertake a challenging course of study that will prepare them for post-graduate studies and or professional career opportunities in the international arena. International Economics Romance Languages majors will learn how aesthetic and cultural categories and value judgments are shaped by economic trends and political conditions and how political conditions and economic trends are influenced by aesthetic and cultural trends.

COURSE DESCRIPTIONS

All of the courses associated with these academic programs can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Romance Languages & Literature***
- ***French***
- ***Italian***
- ***Portuguese***
- ***Spanish***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Sociology

Chair:
Terence McDonnell
William R. Kenan Jr. Endowed Chair:
Christian Smith
Nancy Reeves Dreux Endowed Chair:
Rory McVeigh
Professors:
Mark Berends; William J. Carbonaro; Timothy Hallett; Tamara Kay; Terence McDonnell; Sarah Mustillo, Catherine Riegle-Crumb; J. Samuel Valenzuela; Richard A. Williams
Concurrent Professors:
Michael Agliardo; Anna Geltzer; Jennifer Huynh; Atalia Omer; Gwendolyn Purifoye; Amanda Sharkey; Jason Springs; Orla Stapleton; Margaret Traeger; Sharon Yoon
Associate Professors:
Steven Alvarado; Kraig Beyerlein; Kevin J. Christiano; David Gibson; David S. Hachen Jr.; Anna Haskins; Amy Langenkamp; Elizabeth Aura McClintock; Erin Metz McDonnell; Ann Mische; Dana Moss; David Sikkink; Erika Summers-Effler
Assistant Professors:
Muna Adem; Molly Copeland; Daniel Tadmon
Associate Teaching Professor:
Mim Thomas
Director of Undergraduate Studies:
Mim Thomas

Program of Studies. Sociology at Notre Dame combines rigorous academic training with a focus on social justice and human rights, emphasizing the use of evidence to ask and answer complex questions. The sociology curriculum provides students with a strong background in empirical research, statistical analysis and sociological theory enhancing students' understanding of how the environments in which people are embedded influence their perceptions, actions and life chances.

Through its emphasis on critical thinking and sound data collection and analysis, sociology prepares students to excel in a variety of disciplines. Notre Dame's sociology majors go on to have careers in business, law, medicine, health care administration, politics, religious ministries, research institutions, non-profits, social work, teaching and academia.

MAJOR

The sociology major offers our students both structure and flexibility. In addition to providing students with a strong foundation in the core of the discipline, sociology at Notre Dame also encourages our students to explore and study in depth several areas of specialization, including race and ethnicity, immigration, gender, education, religion, family, crime, law, culture, social networks, and inequality.

The requirements of the major are as follows:

(a) Students must take a minimum of 31 credit hours (usually 10 courses and the proseminar which is one credit) offered by the department. Students are urged to start their major as early as possible but may declare a major or change majors at any time as long as they are able to fulfill the requirements.

(b) Central to the requirements for the major are the following four courses:

SOC 30900. Foundations of Sociological Theory
SOC 30902. Methods of Sociological Research,
or
SOC 30952. International Research Design
SOC 30903. Statistics for Sociological Research
SOC 33090. Proseminar (1 credit)

The above required courses should be taken as soon as possible, especially before taking any 4xxxx-level courses.

(c) Each major must take a minimum of three 4xxxx-level lecture, seminar or research courses. Internships (SOC 45000) and Directed Readings in Sociology (SOC 46000) do not fulfill this requirement.

(d) Each major must also acquire at least 12 credits of sociology elective courses, usually consisting of four 3-credit courses. These courses may be at any level, 10xxx–4xxxx.

MINOR

Additionally, the Sociology Department offers a minor, requiring 15 credit hours. Students minoring in sociology not only gain unique insight into the complexity of social life but also develop practical skills which enhance their major field of study. The sociological imagination teaches students how to understand context and is therefore relevant for success in the classroom and beyond.

The requirements of the minor are as follows:

(a) One course in sociological theory, usually SOC 30900, Foundations of Sociological Thought (3 credits)

(b) SOC 30902, Methods of Sociological Research or SOC 30952, International Research Design (3 credits)

(c) Two Sociology classes (5.5–6 credits) at any level

(d) At least one sociology elective at the 40000 level (3 credits)

Our Students. Because of its broad applicability, strong emphasis on both qualitative as well as quantitative aspects of social life and commitment to Notre Dame's continuing mission to promote human solidarity and concern for the common good, Sociology at Notre Dame attracts students with a variety of interests, strengths and goals. Many of our students have double majors in areas such as Business, Pre-Health, Engineering, Political Science, Mathematics, Psychology and Liberal Studies among many others. Our majors also pursue numerous minors including Poverty Studies, Peace Studies, Business Economics and Education, Schooling and Society.

The department has an active Epsilon Chapter of Alpha Kappa Delta, the international sociology honor society. Students interested in the qualifications for nomination are encouraged to contact the director of undergraduate studies (Room 823 Flanner Hall) at any time.

Sociology Undergraduate Honors Track. The Department of Sociology offers academically gifted and highly motivated students the opportunity to graduate with departmental honors. In order to participate in the honors track, students must be at least a first semester junior with a minimum major GPA of 3.5.

The requirements for pursuing the sociology honors track are as follows:

- Students must maintain a 3.5 major GPA.
- Students are required to take a 3-credit standard graded graduate level sociology course. While any graduate sociology class is open to students on the honors track, students are required to get permission from the class instructor, prior to requesting departmental approval from the DUS.
- Including the required graduate class, students on the honors track are required to earn at least 34 credits in sociology.
- Students are required to complete a senior thesis.

Writing in Sociology. Sociology at Notre Dame emphasizes the importance of good writing skills. Most of our classes require students produce some written work and typically, our 40000 seminars require students produce a term paper. The Department's required course, "Foundations of Sociological Theory" also fulfills the University's Writing Intensive Core Requirement. All students are encouraged to write a senior thesis, which in addition to fulfilling the University's Writing Intensive Core Requirement, allows students to develop their own research projects over the course of two semesters.

Course Listings by Area of Research Focus. The following is a list of courses offered by the Sociology Department, organized by research focus. Students are encouraged (but not required) to choose at least one area of focus in the major in order to deepen their knowledge of that area. Students are also encouraged to pursue research opportunities within their area of interest.

GENERAL INTRODUCTIONS TO SOCIOLOGY
10002/20002. Introduction to Sociology
10033/20033. Introduction to Social Problems
10722/20722. Introduction to Social Psychology
10723/20723. Social Psychology for Pre-Health Students
23011. Selflessness and Selfishness

REQUIRED COURSES FOR SOCIOLOGY MAJORS
30900. Foundations of Sociological Theory
30902. Methods of Sociological Research
or
30952. International Research Methods
30903. Statistics for Sociological Research
33090. Sociology Proseminar

INDIVIDUAL WORK WITH FACULTY/ SUPERVISOR
41800. Senior Thesis Workshop
45000. Sociology Internship
46000. Directed Readings in Sociology
48000. Directed Research in Sociology
48009. Senior Thesis Capstone Project

CLASS, RACE, ETHNICITY
20870. Inner City America: Decoding "The Wire"
30003. Critical Refugee Studies
30806. Race and Ethnicity: Constructing Identity and Difference
30819. Race, Sport and Inequality
30838. Poverty, Inequality, and Social Stratification
40803. Social Inequality
40838. Race Relations and Ethnic Conflict
43281. Racial and Ethnic Educational Inequality
43581. Race and Activism
43839. Unequal America

CRIMINOLOGY, DEVIANCE, AND SOCIAL CONTROL
10732/20732. Introduction to Criminology
43704. Law, Society and Criminal Justice in the U.S.

CULTURE/MEDIA
20100. Introduction to Cultural Sociology
40200. Visualizing Social Change
43101. Telling About Society: Media, Representation, and the Sociology of Knowledge
43110. Sociology of Media, Technology, and Society
43113. Cultural Sociology
43170. Materialism & Meaning in Modern Life
43165. Art in Everyday Life
43200. Sesame Street Around the World: Organizations and Globalization

DEMOGRAPHY/MEDICAL/ENVIRONMENT
20666. Environment, Food and Society
21666. Environment, Food and Society Lab
10723/20723. Social Psychology for Pre-Health Students
20410. Health, Medicine, and Society
43402. Population Dynamics
43471. Social Aspects of Mental Health

ECONOMICS, POLITICAL, DEVELOPMENT
20501. Globalization and Social Movements
10502/20502. Surviving the Iron Cage: Organizations in a Complex World
20541. Sociology of War and Terror
20550. Development and Human Well-being
20558. Rebellion against Authority
30518. Sociology of Money
33501. Political Protest in a Globalizing World
40050. Social Movements, Conflict, and Peacebuilding
40838. Racial and Ethnic Conflict in the U.S.
43510. Governance and Africa
43513. Sociology of Development
43524. Employment in a Changing Economy
43553. Buildling Democratic Institutions
43555. State Effectiveness in Developing Countries
43556. Religion is Revolting
43579. Social Organization of Secrecy and Deception
43590. Sociology of Economic Life

EDUCATION
20228. Social Inequality and American Education
43212. Can We Improve US Schools?
43281. Racial/Ethnic Educational Inequality

FAMILY & GENDER
20342/10342. Marriage and the Family
20810. Gender Roles and Violence
20818. The Sociology of Sexuality
43377. Family, Gender and Employment
43380. Gender and Sexualities in Family
43818. Sociology of Sexuality

LATINO STUDIES
20479. Introduction to Latinos in American Society
33458. Mexico-U.S. Border Immersion Seminar
43479. International Migration and Human Rights

RELIGION
10672/20672. Deities, Denominations, and Diversity
20610. Sociology of Religion
43516. The Cultural Politics of Religion and Women's Human Rights
43556. Religion is Revolting
43600. Society and Spirit: Religion in Classical Social Thought
48666. Sociology of Religion Research Seminar

SOCIAL PSYCHOLOGY
10722. Introduction to Social Psychology
10723/20723. Social Psychology for Pre-Health Students
20722. Introduction to Social Psychology
33001. Society, Self, and Catholic Social Tradition
43719. Self, Society, and the Environment
43959. How Did I Get Here and Where am I Going?

THEORY/METHODOLOGY/STATISTICS
20919. Algorithms, Data, and Society
23901. Power & Identities
30903. Statistics for Sociological Research
30952. International Research Design
35900. Sociology Research Apprenticeship
43909. Intro to Causal Inference
43910. Contemporary Social Theory
43919. Text Analysis for Social Science
43959. Sociology of the Life Course
43990. Social Networks
43991. Sociology Research Practicum
43999. Quantitative Methods Social Sciences

ANALYTICS TRACK

The Data Science Minor–Analytics Track is designed for undergraduate students with a particular interest in the analytic/modeling phase of the data science workflow, and who have completed prerequisites of Calculus III and ACMS 30600 (or equivalent, as detailed below).

PREREQUISITES
MATH 20550. Calculus III (or equivalent)
ACMS 30600. Mathematical Statistics 1 (or equivalent)

REQUIRED COURSES (6 CREDITS)
CSE 10101. Elements of Computing I
MDSC 20009. Introduction to Data Science

ELECTIVES
Students in the Analytics Track must take 9 credits (3 courses) from the list of approved electives

ACMS 40875. Statistical Methods in Data Mining
ACMS 30550. Mathematical Statistics 1 (or ACMS 30540)
ACMS 40842. Time Series 1
ACMS 40878. Statistical Computing in R 1
ACMS 40950. Topics in Statistics 1
ACMS 40852. Advanced Biostatistics 1
ACMS 40855. Spatio-Temporal Statistics 1
CSE 10102. Elements of Computing II
MDSC 40702/BIOS 40702. The Epidemiology and Ecology of Infectious Diseases
PSY 40122. Machine Learning for Social and Behavoir Research
PSY 30109. R for Data Science
SOC 43919. Text Analysis for Social Science

Notes
ACMS 30600 is a prerequisite. Acceptable alternatives include 1) ECON 30331 if students also have demonstrated competency in R programming; 2) PSY 40120; and 3) other approved combinations of R programming, inference, and multiple regression. For approvals, please consult Prof. Alan Huebner, Director of Undergraduate Studies, ACMS.

PSY 30109 will not count if students have already taken ACMS 24215.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Sociology*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Graduate Courses. Senior honors track majors may take any graduate course with the permission of the instructor and the Director of Undergraduate Studies.

Theology

Chair:
Rev. Khaled Anatolios
Abrams Jewish Thought and Culture Professor of Theology:
Tzvi Novick
Catherine F. Huisking Professor of Theology:
Rev. Brian E. Daley, S.J. (emeritus)
Patrick O'Brien Professor of Theology:
Robin Jensen (emeritus)
Catherine F. Huisking Professor of Theology:
Cyril J. O'Regan
Hesburgh Professor of Catholic Theology:
Gary A. Anderson (emeritus)
John A. O'Brien Professor of Theology:
Rev. Khaled Anatolios
John A. O'Brien Professor of Theology:
Lawrence S. Cunningham (emeritus)
John A. O'Brien Professor of Theology:
Jean Porter (emeritus)
John A. O'Brien Professor of Theology:
Eugene Ulrich (emeritus)
John A. O'Brien Professor of Theology:
James C. VanderKam (emeritus)
John Cardinal O'Hara Professor of Theology:
Ann W. Astell
Jerome J. Crowley and Rosaleen G. Crowley Professor of Theology:
Gabriel Said Reynolds
Keough-Hesburgh Professor of Music History and Liturgy:
Margot Fassler (emeritus)
Walter Professor of Theology:
David E. Aune (emeritus)
Walter Professor of Theology:
Gerald P. McKenny
William K. Warren Professor of Theology:
Ulrich L. Lehner
William K. Warren Professor of Catholic Theology:
Rev. Thomas F. O'Meara, O.P. (emeritus)
Wilsey Professor of Theology:
William C. Mattison, III
Professors:
J. Matthew Ashley (emeritus); John C. Cavadini; David Cloutier; David Fagerberg (emeritus); John Fitzgerald (emeritus); Rev. Daniel Groody, C.S.C.; Mary Catherine Hilkert, O.P.; Rev. Maxwell E. Johnson (emeritus); Rev. Emmanuel Katongole; Robert A. Krieg (emeritus); Blake Leyerle; Rev. Edward A. Malloy, C.S.C. (emeritus); Timothy Matovina; William Mattison, III; Francesca A. Murphy; Rev. Paulinus Odozor, C.S.Sp.; Rev. Hugh R. Page; Paul Scherz; Joseph Wawrykow (emeritus); Randall Zachman (emeritus)
Research Professor:
Robert Gimello (emeritus)
Associate Professors:
Yury Avvakumov; Kimberly Belcher; John R. Betz; David A. Clairmont; Mary Rose D'Angelo (emeritus); Rev. Michael S. Driscoll (emeritus); Rev. Kevin Grove, C.S.C.; Mary Hirschfeld; Rev. Paul V. Kollman, C.S.C.; David Lantigua; David Lincicum; Rev. Nicholas Lombardo, O.P.; Daniel Machiela; Bradley J. Malkovsky (emeritus); Jennifer Newsome Martin; R. Trent Pomplun; Rev. Mark Poorman, C.S.C.; Joel Rasmussen; Maura Ryan; Mun'im Sirry; Alexis Torrance; Todd Whitmore; Jeffrey Wickes; Abraham (Avi) Winitzer
Rev. John A. O'Brien Associate Professor of Theology:
Nathan Eubank
Tisch Family Associate Professor:
Jennie Grillo
Assistant Professors:
Joshua H. Lim; Xueying Wang
Jordan H. Kapson Assistant Professor of Jewish Studies:
Jeremy Brown
Professor of the Practice:
Stacey Noem
Teaching Professors:
Catherine Cavadini; Margaret Pfeil; Todd Walatka
Associate Teaching Professor:
Anthony Pagliarini
Assistant Teaching Professors:
Rev. Terrence Ehrman, C.S.C.; Kristin Haas; James L. Martin; Rebecca Ruvalcaba

THE THEOLOGY PROGRAM UNIVERSITY OF NOTRE DAME

At the University of Notre Dame, the study of theology is carried out in the spirit of the classic formulation of theology as "Faith seeking understanding." The Theology Department dedicates itself to critical reflection on the historic faith of Catholic Christianity in service to our students, to the larger church, to the world of the academy, and to the general public.

Why major in theology?
When the former British prime minister Tony Blair was asked what effect his embrace of Christian faith at the University of Oxford had on him, he commented simply, "I began to make sense of the world." A major in Theology at Notre Dame will challenge you to do just that.

Our majors encounter head-on the great questions of life: Where is the God of justice? What is truth? Who do you say I am? Why did God become a human? What must I do to inherit eternal life?

Yet majors in theology are challenged to do still more. They are challenged to think of their life journey not only in terms of how they might best be served by careers, but also how they might best serve others. Whether they go on to careers in law, medicine, business, journalism, education, ministry, government, or any other field, theology majors do so with an experience of intellectual and spiritual illumination that is absolutely unique.

Our majors also benefit from working closely with faculty in one of the premiere Catholic Departments of Theology in the world. Theology majors at Notre Dame have majored in a field for which Notre Dame is renowned and will study with the best of the best.

When Father Edward Sorin, C.S.C., envisioned the school that would be built next to two remote lakes in Indiana, he commented, "This college will be one of the most powerful means of doing good in the country." This faith in the great potential of the school that would be called Notre Dame emerged from his belief in a Catholic education. Theology majors at Notre Dame, having experienced the fullness of a Catholic education, are indeed powerful forces for good in this country, and in the world.

What are the requirements for the theology major?
Beyond the six theology credits required of every Notre Dame student, primary majors take 28 hours; supplementary majors take 19 hours. Each of these majors combines formally required courses and electives. The two University requirements (6 credits) are prerequisites for upper-level courses. All courses in the theology major, primary or supplementary, must be 3-credit courses and graded (with the exception of the proseminar).

SUMMARY OF THE PRIMARY MAJOR:

- University requirements in Theology (WKFT and WKDT)
- THEO 40201 and 40202—Christian Traditions I and II
- THEO 40101 and 40108—Old Testament and New Testament
- Electives (15 hours at the upper level; up to 6 may be courses in a classical language)
- THEO 43001—Proseminar (1 credit)

Including the University requirements, the primary major thus consists of 34 credit hours.

SUMMARY OF THE SUPPLEMENTARY MAJOR:

- University requirements in Theology (WKFT and WKDT)
- THEO 40201 and 40202—Christian Traditions I and II
- THEO 40101 or 40108—Old Testament or New Testament
- Electives (9 hours at the upper level; up to 6 may be courses in a classical language)
- THEO 43001—Proseminar (1 credit)

Including the University requirements, the supplementary major thus consists of 25 credit hours.

WHAT OTHER PROGRAMS ARE OFFERED?

The Theology Honors Thesis
The Theology Department offers a special program for particularly gifted undergraduate majors who seek a deeper, more sustained experience in the major through the completion of a thesis project. Each spring semester, the junior class of theology majors will be invited to apply; those selected will be assigned a thesis director from among the faculty of the department. A minimum grade point average of 3.66 within the major is normally expected. Seniors

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in the Honors Program will enroll in a one-credit Honors Colloquium as well as a two-credit directed reading course in the fall semester, and a three-credit Honors Thesis Writing course in the spring semester, culminating in the submission of a 40–55-page thesis. The Honors Program will normally consist of 37 hours, as compared to 34 hours in the regular primary major. To receive the honors designation on their transcript, students must earn an A– or higher grade on their thesis. A full description of the Theology Honors Program is available on the departmental website (see below for address).

The Minor in Theology

The minor is recognized by the University on the student's transcript. To fulfill requirements for a minor, a student must take 12 credit hours beyond the required 6 hours (for a total of 18 hours). The additional 12 hours must be composed of 3-credit graded courses, which can be taken at the 20xxx or 40xxx level.

Contact information

You may reach the director of undergraduate studies in theology, through the departmental office:

(574) 631-7811
apaglia1@nd.edu
theology.nd.edu/major-minors/
Department of Theology
130 Malloy Hall
University of Notre Dame
Notre Dame, IN 46556-5601

PHILOSOPHY AND THEOLOGY JOINT MAJOR

Director:

Director of Undergraduate Studies, Theology

Faculty:

Additional faculty for the joint major are drawn from the Departments of Philosophy and Theology.

Program of Studies. The joint major is intended for undergraduates who are intrigued by philosophical and theological ideas and who have an equal commitment to both disciplines. It seeks to equip such students to handle theology and philosophy adeptly. The major is structured, providing undergraduates with a suitable introduction to the study of both disciplines, but also flexible, granting students considerable scope for the pursuit of their own interests.

The joint major offers the opportunity for an informed investigation of religious and philosophical ideas and should appeal especially to those who intend to pursue graduate work in philosophy or theology.

The joint major incorporates the University requirements in the two departments and most of the formal requirements of the first majors in theology and philosophy. Students in the joint major will take the two-semester sequence in Christian Traditions and an upper-level course in Scripture. The joint major, however, does not require the one-credit proseminar in theology.

Other formal requirements are peculiar to the joint major. Students will study a classical language for two semesters. (For practical as well as pedagogical reasons, this will normally be Greek or Latin.) Majors will also be expected to take on one occasion the joint seminar (offered each spring). Each seminar, led by a theologian and a philosopher, will examine an issue in which the differing approaches of philosophy and theology may prove fruitful. The topic and instructors will change from year to year. Finally, each major will submit a senior thesis prepared under the direction of two advisors, drawn from each department. At the option of the directors, this thesis may be presented and discussed in an informal colloquium consisting of the other students in the joint major.

The remaining courses in the joint major will be at the discretion of the student. Normally taken at the 40xxx level, there should be an equal distribution in the electives between theology and philosophy. However, students may devote up to six hours within the joint major to additional language work. These hours may add to the classical language previously studied, or used to begin another language of significance for philosophical and theological work.

The distinctive features of the joint major should make the program particularly attractive to students preparing for advanced study.

PHILOSOPHY AND THEOLOGY JOINT MAJOR:

- University requirements in Philosophy (WKFP and WKSP/WKCD)
- University Requirements in Theology (WKFT and WKDT)
- PHIL 30301 and 30302. History of Philosophy I and II
- PHIL 30313. Formal Logic
- THEO 40201 and 40202. Christian Traditions I and II
- THEO 40101 or 40108. Upper division scripture course

Plus:

- Classical language (normally Greek or Latin)—Two semesters
- Joint Seminar
- Senior Thesis
- 18 credit hours of electives (up to six of these may be additional hours in language study).

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting Theology:

Course descriptions can be found by clicking on the subject code and course number in the search results.

Supplementary Majors, Minors, and Special Programs

A supplementary major is one that cannot stand alone in qualifying a student for an undergraduate degree but must be taken in conjunction with a primary major. Several departments offer both majors and supplementary majors. They have been described above. Included below are interdisciplinary nondepartmental supplementary majors and minors.

THE GLYNN FAMILY HONORS PROGRAM

Directors:

Paul Ocobock; Holly Goodson

The Glynn Family Honors Program offers accomplished and intellectually curious undergraduates the opportunity to work closely with distinguished Notre Dame faculty in small seminar courses and in independent research. Each year, the program admits a select number of outstanding students from the College of Arts and Letters, the College of Science, the Keough School of Global Affairs, and the School of Architecture; candidates are invited to apply at the time of their admission to Notre Dame.

The Program offers honors sections to fulfill most University and College requirements in the students' first and sophomore years. Courses include the year-long Honors Seminar (satisfying the writing, literature, and University Seminar requirements), Honors Math, Honors Philosophy, Honors Theology, and Honors Science. Restricted to honors students, these courses are smaller than standard sections and usually taught in a seminar format, with outstanding faculty instructors chosen from each college. After the first year, students concentrate on their major field of study, but each semester the Program offers elective courses in a variety of subjects. All students in the Glynn Program are required to write a senior thesis that reflects at least two semesters' work under the guidance of a faculty advisor. In Science, the research for this project usually begins sophomore year, and in Arts and Letters, during the spring of junior year. Thanks to the generous endowment of the program by John and Barbara Glynn and family, students may apply for funding to support independent research, including grants for materials, conference travel, and summer research.

In addition to its academic offerings, the Glynn Program offers research and career mentoring, access to an extensive alumni network, and opportunities for social gatherings, service opportunities, and cultural excursions.

Further information on the Glynn Family Honors Program and the criteria for admission may be obtained by contacting Prof. Paul Ocobock or Prof. Holly Goodson, 205 O'Shaughnessy Hall, Notre Dame, IN 46556, (574) 631-5398; or by visiting https://glynnhonors.nd.edu/.

ARTS AND LETTERS PRE-HEALTH SUPPLEMENTARY MAJOR

Director:
Maureen Gillespie Dawson
Assistant Dean
College of Arts and Letters

The Arts and Letters Pre-Health (APH2) supplementary major provides students who intend to pursue a career in medicine or other health professions with an opportunity to complete a major in the College of Arts and Letters while building a firm foundation in the basic sciences. Most students elect APH2 because they wish to go to medical or dental school. These schools encourage prospective applicants to seek a broad, liberal arts education, which enables them to develop skills that will be useful in their career and throughout life. There are, however, many students who intend to pursue other health professions, careers related to healthcare, or simply prefer the integration of science courses into the arts and letters curriculum. APH2 provides students with the necessary prerequisites to prepare for the Medical or Dental Admissions Test and can accommodate the completion of many prerequisite courses for health professions such as osteopathic medicine, physician assistant, physical therapy, nurse practitioner, occupational therapy, pharmacy, veterinary medicine, podiatry, and optometry. All students must carefully research the prerequisite science courses required by the schools to which they will apply.

The APH2 supplementary major consists of 10 core courses: MATH 10350 & 10360, BIOS 10171 & 10172 and labs, CHEM 10171 & 10172 and labs, CHEM 20273 & 20274 and labs, and PHYS 20210 & 20220 with labs, plus three, three-credit upper-level science courses. Labs, research, directed reading, special studies and practicum do not apply to the requirement for upper-level science courses. Those preparing for programs other than medical school may, with permission from the director, substitute two upper-level science courses for two of the core courses. For premed students Biochemistry (CHEM 40420) is required for the MCAT and the completion of one upper-level biology course (especially Cell Biology [BIOS 30341] or Physiology [BIOS 30344]) prior to the exam is strongly recommended. Students interested in one of the other health professions should choose APH2 electives in light of their prospective graduate program's requirements. Please note that a student may use no more than eight credits from AP (Calculus only) toward the APH2 supplementary major. Transfer students may transfer a maximum of 24 science credits for APH2; otherwise, credit for science classes taken outside of Notre Dame does not count toward the APH2 supplementary major unless specifically approved by the APH2 director.

Students who wish to go to medical/dental school directly after graduation should aim to take the Medical/Dental College Admissions Tests in the spring of the junior year

All curricular advising related to the APH2 supplementary major takes place in 104 O'Shaughnessy. The sequencing of courses taken throughout the sophomore, junior and senior years is worked out by the student in close consultation with the APH2 director and the student's departmental advisor so that the best schedule for each individual student is planned. One possible sequence is the following:

SAMPLE STUDY PLAN

First Year

First Semester

MATH 10350. Calculus A[4]	4
CHEM 10171 and lab. Intro to Chemistry Principles[4]	4
WR 13100. Writing and Rhetoric/ Writing Intensive	3
First Theology/First Philosophy[1]	3
Foreign Language	4
Moreau First-Year Seminar	1
	19

Second Semester

MATH 10360. Calculus B[4]	4
CHEM 10172 and lab. Organic Structure & Reactivity	4
Arts & Letters Major	3
University Seminar	3
Foreign Language	4
	18

Sophomore Year

First Semester

BIOS 10171 and lab. Biology I	4
CHEM 20273 and lab. Organic Reactions and Applications	4
Arts and Letters Major	3
College Seminar	3
Foreign Language	3
	17

Second Semester

BIOS 10172 and lab. Biology II	4
CHEM 20274 and lab. Chem across the Periodic Table	4
Arts and Letters Major	3
First Theology/First Philosophy[1]	3
Foreign Language	3
	17

Junior Year

First Semester

PHYS 20210 and lab. Physics I	4
Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Social Science[1, 2]	3
	16

Second Semester

PHYS 20220 and lab. Physics II	4
Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Literature[1]	3
	16

Senior Year

First Semester

Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Second Theology/Second Philosophy[3] (Medical Ethics)/CAD	3
History[1]	3
	15

Second Semester

Arts and Letters Major	3
Arts and Letters Major	3
Second Philosophy/Second Theology[3]	3
Fine Art[1]	3
Elective or Social Science	3
Moreau Senior Capstone	1
	16

Notes:

1. One of these requirements should be a University Seminar.

2. The MCAT includes material in psychology, sociology, and anthropology. Premed students should choose from among those disciplines in fulfilling the social science requirement(s). Introductory Psychology (PSY10000/20000) is highly recommended. Many health professional schools require an additional social science such as anthropology or sociology.

3. The MCAT includes questions on ethics. Premed students should consider fulfilling the second philosophy or theology requirement with a course on ethics.

4. If a student has AP credit for both Calc A & B, Statistics for Life Sciences (ACMS 20340) may be taken to fulfill both an APH2 science elective and the University Quantitative Reasoning requirement.

TECHNOLOGY & DIGITAL STUDIES PROGRAM

Director of Technology & Digital Studies
John T. Behrens
jbehrens@nd.edu
Director of the Bachelor of Arts in Computer Science
William Thiesen
Director of Undergraduate Studies for CDT Minor
Alexi Orchard
cdt@nd.edu
Director of Undergraduate Studies for Minor in Data Science
David Smiley
dsmiley@nd.edu
Administrative Coordinator
Andrea Connors
andrea.connors@nd.edu
Website: ALTech.nd.edu

Program Overview
Technology and Digital Studies is an interdisciplinary program that unites efforts around the study of use, understanding, and critiquing of technologies including the data-centric computing technologies of data science. It is the Arts and Letters home for the interdisciplinary and cross-college matriculations including the Bachelor of Arts in Computer Science, the Minor in Data Science, and the Idzik Computing and Digital Technologies Minor. These programs seek to empower students to be technically savvy leaders in the world by integrating various disciplines that combine computational thinking, social contextualization and the liberal arts foundations of critical thinking, creativity, collaboration and communication. Students in these curricula share student activity space in 217 O'Shaugnessy along with common communications, events, and opportunities for professional development and networking.

Students can find out more about these different curricular offerings at ALTech.nd.edu and in the offering specific sections of this *Bulletin*.

IDZIK COMPUTING AND DIGITAL TECHNOLOGIES (CDT) MINOR

Program Overview
The world is awash in the continuous development and application of new digital technologies that impact many aspects of our personal, social, and business lives. The CDT minor works to grow students into "tech savvy leaders" in whatever vocation they choose, by providing them with a balanced mix of technical, social, and work experiences that take into account the rapid change and impacts of technology.

This minor is an interdisciplinary effort between key departments in Arts & Letters along with the Department of Computer Science & Engineering, and other departments across the University, to offer a unique minor. Students will take CDT courses in multiple colleges to enhance their technical skills and increase their understanding of the ways in which technology can contribute to both personal and professional life. CDT enriches the education of program students, broadens their perspectives, and gives them skills and experience that they, and future employers, will value tremendously.

Program requirements
The Computing and Digital Technologies (CDT) minor requires the following courses:

- A two-semester core course sequence focused on broadly understanding of applications of computing while gaining programming and analytic skills
- A one-credit "Technology as a Profession" seminar that introduces students to the variety of ways technology transforms careers and lives
- Three additional elective courses from one or more of the sub-specialties listed below.

Required Core Courses
All students are required to complete the two semester (fall–spring) core course Elements of Computing I and II sequence. These courses will be offered every year by a TDS Faculty or a faculty member in the Department of Computer Science and Engineering. The core sequence does not assume any prior background in programming and is intended to be an introductory experience for non-engineering students. Ideally, CDT students will complete the core sequences first before taking specialization courses, but that is not generally required. Students are also encouraged to take "Technology as a Profession" as soon as possible upon enrolling in the minor.

Elective Specialty Courses
The CDT elective courses are organized into six categories reflecting the diversity of disciplines within the College of Arts and Letters along with areas of technology expertise that are attractive and legible to potential employers and graduate schools. Program students are encouraged to view these categories as sub-specialty tracks within the minor and may choose to gain depth by taking all of their elective courses in a single track. While specialization is not required, students must take at least two (2) courses with computational/digital focus in a track to earn a specialization in that area.

Courses With and Without Computational or Digital Focus
Most CDT courses have a significant computational or digital focus that involves student learning concerning the use or impacts of technology. However, some may not, instead providing background information that is highly relevant to the particular specialty in question. In those courses without a computational/digital focus, CDT students are encouraged to take advantage of any project or paper requirements in the class to reflect on how computational methods or technology can be brought to bear on the subject matter of the course. CDT students are limited to only one course without computational/digital focus when considering their three (3) electives. If a student earns a specialization in a track with only two courses, both must have a computational/digital focus. Classes with and without computational/digital focus in each track are shown where applicable on the Courses pages.

CDT Specialty Tracks
- *Artificial Intelligence.* This track addresses applied issues in building, using, and critiquing artificial intelligence systems from broad interdisciplinary perspectives. Topics include AI ethics, methods and concerns for building some types of AI systems, impacts of AI on various fields, and organizational impacts and needs. Aspects of this track cut across all other specializations.
- *Digital Arts and Humanities.* This track allows students to focus on how technology can assist in the creation and display of artistic expression, advancing the humanistic studies through the application of technology, and how to understand technology as social/cultural artifacts.
- *User Interface and Experience* (UI/UX). This track allows students to focus on how technology systems should be designed to enhance and maximize the user experience.
- *Cyber Safety and Security.* This track allows students to focus on the vulnerabilities, threats, protections, investigations and legal issues associated with technology systems. Since 2025, some previously taught courses will not be available. New students interested in this track should talk with an advisor in the minor to determine if the track matches their goals and timelines.
- *Technology Development and Management.* This track allows students to focus on the ways in which technology solutions can be developed, implemented, managed, and maintained in organizations.
- *Generalist.* Students who complete the minor without specializing in any of the topical tracks mentioned above, are considered to have approached the program with a generalist perspective and are granted completion under a generalist track. As with other specializations, 2 of the three electives must have a computational and digital focus.

Requirement Completion Options
To complete CDT, a student must take six (6) courses total a minimum of 15 credits, including:

- Two (2) core programming/computing courses taken in sequence; and
- The "Technology as a Profession" seminar; and
- Three (3) elective specialty courses, of which at least two (2) must have a computational and digital focus.

NOTE: Fewer than three (3) specialty courses or fewer than two (2) courses with computational/digital focus will NOT fulfill CDT requirements.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Computing and Digital Technologies (CDT).* Course descriptions can be found by clicking on the subject code and course number in the search results.

MINOR IN DATA SCIENCE (MDSC)

Housed in the Technology and Digital Studies Program, the Minor in Data Science is a cross-college venture between the College of Arts and Letters and the College of Engineering involving departments from across the university. The Data Science Minor offers courses that focus on the acquisition, management, analysis, and use of complex data as well as communication about data with an understanding of the broader implications for society.

Upon completion of the minor, students should be able to:

- Understand and collect data in its different forms.
- Obtain data through scraping (using a program to download and process data from webpages) or mining (extracting and analyzing usable data from a large dataset).
- Parse and transform data into structures designed for analysis.
- Draw meaning from data.
- Visualize data to improve understanding.
- Statistically analyze data to summarize, draw inferences, and make predictions.
- Discover and characterize patterns in large data sets.
- Collect, analyze, and present data in an ethically responsible manner and understand privacy issues.
- Communicate effectively about data, methods, and conclusions.

Data Science is a fifteen (15) credit interdisciplinary minor, offering classes from departments across the university, including Sociology, Computer Science Engineering, Psychology, Economics, English, Philosophy and Design.

REQUIREMENTS
Prerequisite: One Class in Statistics

The minor accepts the following classes: SOC30903 Statistics for Sociological Research; ECON30330, Statistics for Economics; Math30540 Mathematical Statistics; PSY30100 Experimental Psychology I; Statistics; ACMS20340 Statistics for Life Sciences; ACMS30440 Probability and Statistics; ACMS30600 Statistical Methods and Data Analysis; ITAO 20200/BAMG 20150 Statistical Inference in Business.

Students may petition to have other statistics courses accepted to fulfill the requirement, by contacting the Director of Undergraduate Studies for the minor, David Smiley (dsmiley@nd.edu).

Required Courses (6 Credits)
CSE 10101/CDT30010. Elements of Computing I (or equivalent)

MDSC 20009/SOC 20009. Introduction to Data Science

Electives
To complete the minor, students must take 9 credits (3 courses) from a provided list of electives, available in a wide variety of areas, from philosophy to physics, and English to epidemiology. Students may choose a set of electives that enables them to specialize.

ANALYTICS TRACK

The Data Science Minor–Analytics Track is designed for undergraduate students with a particular interest in the analytic/modeling phase of the data science workflow, and who have completed prerequisites of Calculus III and ACMS 30600 (or equivalent, as detailed below).

Prerequisites
MATH 20550. Calculus III (or equivalent)

ACMS 30600. Mathematical Statistics 1 (or equivalent)

Required Courses (6 Credits)
CSE 10101. Elements of Computing I

MDSC 20009. Introduction to Data Science

Electives
Students in the Analytics Track must take 9 credits (3 courses) from the list of approved electives.

Notes:

ACMS 30600 is a prerequisite. Acceptable alternatives include 1) ECON 30331 if students also have demonstrated competency in R programming; 2) PSY 40120; and 3) other approved combinations of R programming, inference, and multiple regression. For approvals, please consult Prof. Alan Huebner, Director of Undergraduate Studies, ACMS.

PSY 30109 will not count if students have already taken ACMS 24215.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the keyword "MDSC". Course descriptions can be found by clicking on the subject code and course number in the search results.

***Graduate Courses.* Senior honors track majors may take any graduate course with the permission of the instructor.**

DUAL-DEGREE PROGRAM WITH THE COLLEGE OF ENGINEERING

Coordinators:
College of Engineering
Michael Ryan
Assistant Dean
College of Arts and Letters
Patrick Gamez and
Advising Dean for each cohort

Program of Studies. The five-year dual degree program between the College of Arts and Letters and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of arts from the College of Arts and Letters and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 1952, offers students the advantages of both a liberal and a technical education. The student completing one of these combination programs has a background in the humanities and social sciences as well as a degree from one of the programs offered by the College of Engineering. Advisors for the program are available for consultation about the advisability of entering the program and about meeting the particular needs of each student pursuing this program. Qualified students are eligible for financial support for their 5th year through the John J. Reilly Endowed Scholarship fund; modest financial support may also be available for their third and fourth years.

The decision to enter the program ideally should be made during the sophomore year. No declaration can be made after the beginning of junior year. Three sets of requirements must be met by students in the program: University requirements, Arts and Letters requirements and Engineering requirements, as the following table indicates.

University Requirements
Six courses in the liberal arts:

Liberal Arts 1. Quantitative Reasoning	3
Liberal Arts 2. Science and Technology	3
Liberal Arts 3. Another Quantitative Reasoning or Science and Technology	3
Liberal Arts 4. Arts and Literature or Advanced Languages and Cultures	3
Liberal Arts 5. History or Social Science	3

Liberal Arts 6. Integration, or a course from an area not yet chosen in 4 or 5 above	3
Theology/Philosophy:	
Theology	6
Philosophy/Catholicism and the Disciplines	6
The two-semester Moreau Program	2
	32*

**Please consult the University Requirements section of this* Bulletin *for details.*

Arts and Letters Requirements

College Seminar	3
Literature	3
History	3
Foreign Language* (1–4 courses)	3–14
Fine Arts	
Social Science	
Major	30
	42/45

Engineering Requirements

CHEM 10171	4
MATH 10550, 10560, 20550, 20580	15
PHYS 10310, 10320	8
EG 10111, 10112	6
	33

Major
approximately 60 credits (see specific major for details)

Engineering Program
Engineering degree program (required courses and program or technical electives) 69–75
Total : 170–179

Schematic Program of Studies
The exact sequence of courses will vary based on the specific majors selected.

First Semester	
WR 13100. Writing and Rhetoric	3
Intro to Theology/Philosophy	3
CHEM 10171. General Chemistry: Fundamental Principles	4
EG 10111. Introduction to Engineering Systems I	3
MATH 10550. Calculus I	4
Moreau First-Year Seminar	1
	18

Second Semester	
University Seminar (Theo/Philo recommended)+	3
CHEM 10122. General Chemistry: Biological Processes	3
EG 10112. Introduction to Engineering Systems II	3
MATH 10560. Calculus II	4
PHYS 10310. General Physics I	4
	17

Third Semester	
Modern Language	3
PHYS 10320. General Physics II	4
MATH 20550. Calculus III	3.5
Engineering Program†	3
Engineering Program	3
	16.5

Fourth Semester	
Theology/Philosophy	3
College Seminar	3
Modern Language	3
MATH 20580. Linear Algebra and Differential Equations	3.5
Engineering Program	3
Engineering Program	3
	18.5

Fifth Semester	
History/Social Science	3
History/Social Science	3
Engineering Program	3
Arts and Letters Major††	3
Engineering Program	3
Engineering Program	3
	18

Sixth Semester	
Philosophy/Theology	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18

Seventh Semester	
Literature	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18

Eighth Semester	
Fine Arts	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
	18

Ninth Semester	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18

Tenth Semester	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18

+ The University Seminar may be selected from an appropriate history, social science, fine arts or literature course, or the first course in theology or philosophy.

** Students who place out of lower level language courses must take at least one language course at the appropriate level.*

† Courses specified by the student's major engineering department.

†† Courses necessary to fulfill the requirements for a major in the student's major arts and letters department.

EDUCATION

Elementary Education
The Notre Dame student taking elementary education at Saint Mary's College must also complete a Notre Dame major along with the University and appropriate college requirements. Those interested in the elementary education program are encouraged to take the prerequisite course, EDU 201, at Saint Mary's in the second semester of their first year of studies. With appropriate planning, and possibly summer-school course work, both the Notre Dame major and elementary teaching certification can be completed in four years.

Secondary Education
(including middle school)
The following Notre Dame majors have been approved for secondary education licensing through the Education Department at Saint Mary's College:

In the College of Science: biology, chemistry, mathematics.

In the College of Arts and Letters: English, languages (French, Spanish, Latin), art, music, social studies (history and political science). Students interested in a secondary license in social studies must also complete additional course work in political science or history (depending on the major) and in one other area: either economics, sociology, or psychology.

In the College of Business: business education.

Notre Dame undergraduates interested in one of the professional teacher education programs should apply to the department the first semester of the sophomore year, but in some cases may start as late as the first semester of the junior year.

Students in the College of Arts and Letters, contact the Advising Dean for each cohort for more information and help with planning.

Interdisciplinary Minors within the College

During the junior and senior years, students may elect to complete one or more interdepartmental minors in addition to the departmental major sequence. Composed of 15 hours of class work chosen from at least two departments, these minors encourage students to think from an interdisciplinary perspective about a given issue or topic. Requirements for completion are determined by the faculty director in consultation with the relevant college committee. Current offerings include Catholic Social Tradition; Education, Schooling, and Society; Gender Studies; Hesburgh Program in Public Service; Journalism, Ethics, and Democracy; Latino Studies; Medieval Studies; Peace Studies; Philosophy, Religion and Literature; Philosophy, Politics, and Economics; and Science, Technology, and Values. These were formerly called concentrations and are described in detail below.

CATHOLIC SOCIAL TRADITION

Directors:
Margaret Pfeil
(mpfeil1@nd.edu/574-631-9378)
Suzanne Mulligan
(smulliga@nd.edu/574-631-4173)
Program Assistant:
Paula Muhlherr
(muhlherr.1@nd.edu/574-631-9402)
Program Website:
cstminor.nd.edu

The Minor in Catholic Social Tradition is an interdisciplinary minor that explores the rich tradition of the Church's social doctrine. Students will gain a deep knowledge of both the magisterial texts of this tradition and the "signs of the times" that inspired popes, synods, and bishops' conferences to expand this body of teaching. They will also become familiar with the scholarship of theologians actively working in this field.

CST is rooted in several core concepts, including: justice, the common good, solidarity, human dignity, integral human development, subsidiarity, integral ecology, and the preferential option for the poor. These concepts feature throughout the courses on the Minor.

The Church's social doctrine begins with the pontificate of Leo XIII when he issued *Rerum Novarum* (1891), an encyclical letter dedicated to the plight of the working poor in industrial Europe. Since then, popes have drawn upon *Rerum Novarum* to broaden Pope Leo's set of social, economic and political concerns. Popes, regional bishops' conferences, and synods continue to address urgent local and global issues across all spheres of life from the family to international politics.

Today, the human family faces several urgent moral challenges. In response to this, the Church's social teaching seeks to engage in collaborative intellectual engagement on matters such as ecological justice, human trafficking, homelessness, poverty, war and conflict, and migration. In so doing, it helps advance interdisciplinary, sophisticated thinking that is rooted in human dignity and the common good.

Graduates of Notre Dame assume leadership positions in a broad spectrum of professions and spheres of life, ranging from politics, law, education, science, the media, technology, and the military. This Minor in Catholic Social Tradition is a resource for Notre Dame students to critically engage with the Church's social mission in the world, and to be inspired to become agents of positive social transformation throughout their lives.

The Minor in Catholic Social Tradition involves 15 credits of coursework. Students must take five 3-credit courses, which includes a Gateway course (3 credits), a Senior Capstone course (3 credits), and three electives.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Catholic Social Tradition*. Course descriptions can be found by clicking on the subject code and course number in the search results.

CONSTITUTIONAL STUDIES

Director:
Vincent Phillip Muñoz
(vmunoz@nd.edu/574-631-0489)
Associate Director:
Debbie O'Malley
(domalle2@nd.edu)
Program Website:
constudies.nd.edu

Nothing has done more for justice in the modern world than the development of the rule of law under constitutional principles. But, for constitutional governments to secure the common good, thoughtful and educated citizens must possess certain virtues; they must understand and be able to implement, defend, and, if need be, reform constitutional institutions. The Constitutional Studies minor seeks to nurture such citizens, thereby contributing to the University's mission to pursue truth and to nurture a concern for the common good that will bear fruit as learning becomes service to justice.

Constitutional Studies minors receive invitations to participate in extracurricular events associated with the Center for Citizenship & Constitutional Government. Building on courses across the College of Arts and Letters, the minor in Constitutional Studies is designed to encourage students to confront fundamental questions concerning justice, the rule of law, and human flourishing. From a variety of historical, cultural, disciplinary, and philosophical perspectives, constitutional studies courses ask questions such as:

- What is a just regime? Is there a best regime? Who ought to rule?
- What is the relationship between Catholicism and constitutionalism? How does the Catholic intellectual tradition inform and deepen our understanding of constitutionalism and the common good?
- What is the proper relationship between government and civil society, between law and moral principles?
- What are the philosophical foundations of human rights and constitutional democracy?
- What principles of justice can or should lie at the foundation of a constitutional republic?
- What are the proper relationships between church and state and religion and politics, and how do these relationships reflect the more basic relationship between faith and reason?
- What are the moral, social, and political conditions necessary to sustain America's experiment in constitutional government?
- What is the nature of international law and how are international norms created and maintained?

The Constitutional Studies Minor requires 15 credit hours of classwork—the 3-credit gateway class and 12 additional electives credits.

Students must take one of the minor's two gateway courses (3 credit hours). These courses address core topics in constitutional studies, such as the history and philosophy of constitutional government, the American Founding, human rights, and contemporary constitutional issues in American and international law.

The elective courses are grouped into the following themes:

- The American Founding and American Constitutional History
- Constitutional Government and Public Policy
- Comparative Constitutionalism and International Law
- Constitutionalism: History and Philosophy

Elective courses that count for the Constitutional Studies minor for current and past semesters are listed on the minor's website (constudies.nd.edu/courses).

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at constudies.nd.edu/courses OR at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Constitutional Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

EDUCATION, SCHOOLING, AND SOCIETY

Director:
Dr. Andrea Christensen
Director of Undergraduate Studies:
Fr. Kevin Sandberg, CSC, Ph.D.
Core Faculty:
Dr. Jodene Morrell; Dr. Maria McKenna

Program Description: The Education, Schooling, and Society (ESS) program is home to both a minor and supplementary major. The primary goal of this interdisciplinary program is to help students acquire diverse perspectives on important questions in education. Education is a complex and challenging aspect of the human experience. It is both an end in itself and a means to many personal, professional, and spiritual goals. Thus, understanding its history and traditions, analyzing its processes, critiquing its goals, and studying its outcomes are of great importance to all of us. ESS uses the tools and resources of a liberal arts perspective to help students reflect on, research, and influence the role of education in society. In addition, the program provides a rich body of resources for students who may want to pursue careers in education or youth-facing careers after graduation, including teaching, research, working for non-profits, or policy making.

ESS Minor Requirements (15 credit hours)
Introduction to Education, Schooling, & Society (ESS 33600); and

Three Electives (9 credits)—two education-focused (ESEI-MEDS) and one education-general (ESED-MEDS); and

Senior Capstone Research (3 credits)—The capstone project provides students with an opportunity to build upon and extend the work they have completed in fulfilling the requirements for the minor. Students may undertake this in one of three ways: (1) Senior Research Seminar (ESS 43640) in fall semester of their senior year; (2) Thesis in ESS (ESS 48100), an independent study completed over the course of senior year (1-credit ESS Thesis course in the fall semester, and a 2-credit ESS Thesis course in the spring semester of senior year); or (3) a thesis in the student's major department that incorporates the study of an educational issue into the research question (requires approval and a second reader from the Institute for Educational Initiatives). Students who choose the third option must take a fourth ESS elective to complete the minor.

ESS Supplementary Major Requirements (24 credit hours)
The supplementary major requirements are as follows:

The completion of all ESS minor requirements listed above (15 credits); and

An educationally-relevant community based learning course (CBL) (within or outside of ESS with approval) (3 credits). Requirement may be fulfilled by completing NDBridge through the Institute for Social Concerns; and

An educationally-relevant research methods course (3 credits); and

One additional education-focused elective (3 credits); and

Community outreach requirement: A signed statement by the student and supervising faculty member that the student has engaged in a practical learning experience that involves a minimum of 14 hours of service, research, or structured observation in PK–12 schools or educationally-relevant community organizations serving PK–12 students. Please see the ESS webpage at: https://iei.nd.edu/initiatives/education-schooling-and-society/education-schooling-and-society-ess for more information on ways to meet this requirement.

Supplementary major students will focus their coursework within ESS along one of the following three tracks with the help of ESS advisers and the use of course attributes.

Learning Sciences
Students in the learning sciences track examine the mechanisms involved in learning, thinking, and problem solving in school and non-school settings. They learn basic theories of cognition, learning, and development; expand their methodological toolkit for testing and evaluating said theories; and gain a rich understanding of how to apply empirical research evidence to design innovative learning environments, including those built around new technologies and media. Through this track, students gain a deeper understanding of how the reciprocal relations among mind, brain, behavior, and environment contribute to human learning. They also gain expertise in the design, analysis, and evaluation of formal and informal educational interventions.

Comparative Education and Policy
Students in the comparative education and policy track examine the policymaking and social programs relevant to mass education. They learn about the historical and contemporary contexts that shape education as well as the underlying philosophical principles and political systems that govern education's role in social and economic change. Students will have the opportunity to study topics relevant to comparative and international education, including international development education; ethnographic, anthropological, and historical approaches to education; postcolonial thought; learning from high performing systems; and area studies of particular country's education systems, including the United States.

Language, Literacy, and Culture
Students in the language, literacy, and culture track critically evaluate the ways in which culture, history, and ideology shape educational practices in schools, classrooms, society, and homes. They learn about how children, adolescents, parents, and teachers read, write, speak, and use images, symbols, and languages to understand and change their world. In the process, students learn, evaluate, and practice strategies for creating culturally-responsive, reciprocal instructional environments. For instance, students could consider literacy and literate practices beyond traditional notions of decoding/encoding, understanding how one's literacy contributes to their sense-making in/of the world and to their active participation in groups and social and cultural contexts.

General Policies: The ESS program will accept courses marked as "Univ. Req." via the online class search (PATH) if they are listed/cross-listed with ESS. The program will not accept CSEM courses for credit but will consider education-related USEM courses on a case-by-case basis (note that there are three ESS USEMs). ESS will accept no more than one international course for credit toward the minor and two for the supplementary major. It is important to note that ESS students may not count courses that apply to other majors or minors without replacing those credit hours with another elective course within ESS.

ESS faculty work closely with students on undergraduate discernment, research, and postgraduate planning (e.g., employment, graduate or professional school, service opportunities). Typically, students apply for admission to the program late in their freshman year or during their sophomore year. For more information or to sign up for the minor or supplementary major, contact Kevin Sandberg, C.S.C., at ksandberg@nd.edu.

COURSE DESCRIPTIONS
Please see InsideND for a complete list of current and past courses.

HEALTH, HUMANITIES, AND SOCIETY

Program Director:
Vania Smith-Oka, Professor, Anthropology

Knowledge about health—whether from the perspective of the public health professional, doctor, policy maker, or patient—is not merely a collection of technical skills and academic knowledge. Medical practice is always simultaneously technical, scientific, humanistic, and social. In this minor, health and medicine are lenses through which to analyze and understand a variety of contemporary issues. By integrating health, medicine, the humanities, and society this minor will provide students with an interdisciplinary approach and framework to understand the myriad ways of conceptualizing the body, the profound effects of illness and disease on people, the impacts of policies and structures on the lives and practices of health professionals, and the complex historical and social worlds in which they live and function.

Health, Humanities, and Society prepares students for the technical, scientific, humanistic, and social facets of health simultaneously. The goal is to broaden students' views and encourage them to embrace new ways of thought and experience by taking classes across the College of Arts and Letters. It

serves the intellectual needs of any student interested in matters of health, regardless of what their career paths may be. The learning goals for the program are for students to: (1) understand that medicine is more than a technical body of knowledge; (2) learn the deeper social and humanistic factors underpinning of health; (3) be exposed to an interdisciplinary body of knowledge that spans humanities and the social sciences; and (4) engage with or master perspectives that will better prepare them for careers in health care.

In addition to our wide selection of interdisciplinary courses, the minor offers opportunities for undergraduate research and internships in the health fields. The Reilly Center already hosts a number of lectures, forums, and seminars relevant to students in the minor, such as Educating the Whole Physician.

Requirements
Five courses (15 credit hours). All students will take two core classes and three electives, which they can select from the list of available courses or, in consultation with an adviser, they can create classes within thematic concentrations, such as Health and Equity; Inequality, Justice, and Race; Gender and Health; Medicine and the Arts; History of Biomedical Sciences; Global Health.

Core Classes (6 credit hours):
The U.S. Healthcare System in Perspective; Contemporary Concerns in Medicine

Electives (9 credit hours):
We offer a wide selection of elective courses across Arts and Letters. One course may be substituted by a single-semester senior essay or capstone project.

Contact information:
The Reilly Center, Director of HHS, Dr. Vania Smith-Oka, vsmithok@nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Health, Humanities, and Society.* Course descriptions can be found by clicking on the subject code and course number in the search results.

HESBURGH PROGRAM IN PUBLIC SERVICE

Director:
Ricardo Ramirez
Associate Director:
Claudia Francis
claudia.francis@nd.edu

The Hesburgh Program in Public Service serves students interested in public policy and public service. By preparing students for engaged citizenship, the Program honors the dedicated leadership and public service of the late Rev. Theodore Hesburgh, C.S.C.

The health of American society is closely related to good public policy and ethical leadership. Through an interdisciplinary curriculum in public policy, the Hesburgh Program provides a foundation for students who plan to pursue careers in the public-sector, non-profits, or private business and seek to be knowledgeable and effective citizens.

The minor consists of 15 credit hours: Introduction to Public Policy, three electives, and a capstone during the junior or senior year. All students take Introduction to Public Policy, preferably early in the program. Elective categories are "values," "institutions," and "topics." Hesburgh minors will take two courses in policy topics and one from either the values or institutions category. The goal of the capstone seminar is to help students develop an understanding of the political processes that drive contemporary public policy issues, focusing on understanding the challenges to creating effective policies. Alternatively, students can elect to do an independent, semester-long capstone project. In addition to these courses, students must also complete three co-requisites: Introduction to American Politics, Introduction to Microeconomics, and a course in Statistics. These requirements can count towards the student's major(s) or other minor, and will be waived for students that receive University credit for AP tests.

The Hesburgh Program encourages students to pursue summer internships and offers generous support through the Gary Lyman Internship Stipend Grants.

Interested students should visit the program's website, hesburghprogram.nd.edu, to learn more and schedule an advising meeting.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at hesburghprogram.nd.edu/courses or at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Hesburgh Program in Public Service.* Course descriptions can be found by clicking on the subject code and course number in the search results.

JOHN W. GALLIVAN PROGRAM IN JOURNALISM, ETHICS, AND DEMOCRACY

Director:
Jason Kelly

The John W. Gallivan Program in Journalism, Ethics, and Democracy offers several courses for students interested in careers in print, broadcast, online, and multimedia journalism. Begun in 1997 with a grant from the John S. and James L. Knight Foundation and now endowed by the family of John W. Gallivan, this minor combines professional training in journalistic skills with examination of philosophical concerns related to the practice of journalism. For example, what ethical issues arise in preparing a particular story? Or what role does—and should—journalism play in a self-governing society? The journalism minor requires completion of 15 hours in addition to a student's major requirements and a news-related internship during either the summer or the academic year. Fundamentals of Journalism is the first, or gateway, class for the program. Other courses that count for the minor include Investigative Reporting; Applied Multimedia; Persuasion, Commentary, and Criticism; Broadcasting the News; and Ethics in Journalism.

The director of the program is Jason Kelly, the editor of *Notre Dame Magazine* and a former sports reporter, editor, and columnist at the *South Bend Tribune.* Notre Dame graduates in journalism regularly provide guidance and mentorship for students enrolled in the program; those alumni include Sarah Childress, a senior editor with *ProPublica;* Maddie Hanna, reporter, *The Philadelphia Inquirer;* Sarah Mervosh, reporter, *The New York Times;* Michelle Krupa, CNN; and Chris Hine, sports reporter, *Minneapolis Star Tribune*.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Journalism, Ethics & Democracy.* Course descriptions can be found by clicking on the subject code and course number in the search results.

LATINO STUDIES

Director:
Professor Jason Ruiz
Director of Undergraduate Studies:
Karen Richman

Program of Studies
Latino Studies is an interdisciplinary field of academic research and scholarship engaged in understanding the past, present, and future of the youngest and fastest-growing population in the United States. Latinos encompass immigrants from every country in Latin America and the Caribbean as well as those whose ancestors were long ago incorporated during U.S. westward expansion. The supplemental major

and minor in Latino Studies engage students with the latest research and analysis on the diverse Latino population in fields such as American studies, anthropology, history, literature, political science, sociology, and theology. Each semester, the Institute for Latino Studies offers approximately fourteen undergraduate courses that range from classroom lectures and seminars to community-based, service-learning courses in the local Latino community of South Bend. ILS also offers annual summer service-learning courses in Chicago, Los Angeles, and Washington, D.C. Latino Studies is relevant to practically every academic discipline and to careers in architecture, business, church leadership, community organizing, the arts, engineering, law, medicine, teaching, and much more. Latino Studies enhances students' leadership and effectiveness in whatever pathway your life takes you beyond Notre Dame.

Supplementary Major

The supplementary major in Latino Studies consists of twenty-four (24) credits: a gateway course (3 credits), capstone/practicum course (3 credits), and eighteen (18) credit hours or the equivalent of six additional Latino Studies courses.

Requirements:
1. Gateway Course (3 credits)
ILS 20701, Introduction to Latinos in American Society. This course examines the Latino experience in the United States, including the historical, cultural, social, economic, political, and religious foundations of the diverse U.S. Latino population.

2. Capstone/Practicum Course (3 credits)
In this 40000-level course, students meet in a seminar-style class and complete a substantial research project (approximately 15–20 pages) based on bibliographic and/or experiential research in Latino Studies.

3. Elective Courses (18 credits)
Students take six more Latino Studies courses as electives chosen in consultation with the ILS Director of Undergraduate Studies.

4. Senior Thesis Option (3 credits)
A senior thesis in Latino Studies is encouraged, but not required, for students enrolled in the supplementary major. In addition, Glynn Honors Program students enrolled in the Latino Studies program as minors or supplemental majors may also write a senior thesis in Latino Studies. Thesis students take the thesis-writing course in Latino Studies (ILS 48900) under the direction of their thesis faculty supervisor. A minimum grade point average and faculty recommendation are required for acceptance. Students interested in writing a senior thesis should apply to the ILS Director of Undergraduate Studies by the spring of their junior year.

5. Directed Reading Course Option (1–3 credits)
A directed readings course (ILS 46711) allows a student to explore in depth a theme or subject in Latino Studies under the guidance of a faculty member. Directed readings cover material that is not offered as a regular classroom course. Enrollment requires the approval of the Director of Undergraduate Studies.

Minor

The minor in Latino Studies consists of fifteen (15) credit hours: a gateway course (3 credits), capstone/practicum course (3 credits), and nine (9) credit hours of elective course work.

Requirements:
1. Gateway Course (3 credits)
ILS 20701, Introduction to Latinos in American Society. This course examines the Latino experience in the United States, including the historical, cultural, social, economic, political, and religious foundations of the diverse U.S. Latino population.

2. Capstone/Practicum Course (3 credits)
In this 40000-level course, students meet in a seminar-style class and complete a substantial research project (approximately 15-20 pages) based on bibliographic and/or experiential research in Latino Studies.

3. Elective Courses: (9 credits)
Students take three additional Latino Studies courses as electives chosen in consultation with the ILS Director of Undergraduate Studies.

4. Senior Thesis Option (3 credits)
A senior thesis in Latino Studies is encouraged, but not required, for students enrolled in the minor. In addition, Glynn Honors Program students enrolled in the Latino Studies program as minors or supplemental majors may also write a senior thesis in Latino Studies. Thesis students take the thesis-writing course in Latino Studies (ILS 48900) under the direction of their thesis faculty supervisor. A minimum grade point average and faculty recommendation are required for acceptance. Students interested in writing a senior thesis should apply to the ILS Director of Undergraduate Studies by the spring of their junior year.

5. Directed Reading Course Option (1–3 credits)
A directed readings course (ILS 46711) allows a student to explore in depth a theme or subject in Latino Studies under the guidance of a faculty member. Directed readings cover material that is not offered as a regular classroom course. Enrollment requires the approval of the Director of Undergraduate Studies.

Summer Service Learning Courses
The Cross-Cultural Leadership Program (CCLP) engages students in real-world applications of their academic studies through summer service learning in Chicago, Los Angeles, and Washington, D.C. Students in this three-credit, eight-week summer course will be immersed in community-based and national organizations. They will also engage in critical study related to their service learning in a class led by an ILS professor. To promote full immersion in this service-learning experience, students will not be placed in their home communities.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Latino Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

LINGUISTICS

Director of Undergraduate Studies:
Alessia Blad-Miller; Mary Davis

Linguistics, the scientific study of human language, is an investigation into a complex domain of human knowledge. Students of linguistics master a variety of conceptual and empirical techniques that enrich all of their coursework as well as their careers after graduation.

Because of the field's inherent interdisciplinary nature, students of linguistics have connections with a wide variety of fields, including neuroscience, literature, anthropology, psychology, philosophy, computer science, English, and other area studies. Some may choose to focus on academic postgraduate studies; others may bring their understanding of human language to careers in information technology, education, translation or interpretation, publishing, dictionary development, legal, medical, or public health, consulting, advertising, government, and various aspects of the arts.

The undergraduate Minor in Linguistics requires completion of five courses and completion of the same language co-requirement as follows:

Co-requirement: evidence of second language learning experience equivalent to 4 semesters of the same second language through coursework and/or placement tests

Requirements (5 Courses / 15 Credit Hours)

Gateway Course: CSLC 20301. Introduction to Linguistics (3 credits)

Core Course (3 credits):
- ANTH 20204. Fundamentals of Linguistic Anthropology
- ANTH 45842. Doing Things with Words
- PHIL 43902. Philosophy of Language
- PSY 43455/63455. Psycholinguistics
- PSY 43456/63456. Pragmatics of Language Usage

Electives (6 credits): (Core courses not taken to fulfill the core course requirement can be taken as electives)
- ANTH 30400. Language and Culture
- ANTH 35370. New Media
- ANTH 40141. Language and Power
- CSE 40657/60657. Natural Language Processing
- CSLC 20302. Introduction to Sociolinguistics
- CSLC 20304. Digital Literacy in Language Learning
- CSLC 30100. Modern English Grammar

- CSLC 30101. Introduction to Second Language Acquisition
- ENGL 40203. Introduction to Old Norse
- ENGL 40211. History of the English Language
- ENGL 40212. Introduction to Old English
- PHIL 30313. Formal Logic
- PHIL 43916. Natural Language Semantics
- PSY 43251/63251. Language Development

Capstone:
CSLC 48000. Independent Research Project (3 credits). Students are required to complete an independent, article-length research paper under the direction of an approved faculty member and overseen by the Director or Assistant Director of the CSLC. During the semester in which students complete this project, they enroll in a 3-credit research practicum. This guides students through the writing process and requires regular updates and presentations on their individual projects. The final paper is graded and signed off on by the approved faculty member.

The Minor in Linguistics is housed in Center for the Study of Languages and Cultures (CSLC). Profiles of the faculty, course descriptions, and additional information about the minor can be found on the CSLC's website at cslc.nd.edu.

LITURGICAL MUSIC MINISTRY

This 15-credit minor consists of two 3-credit courses in theology and two 3-credit courses in music, plus 3 credits of music lessons or approved ensembles, to be selected in consultation with the student's music advisor. Contact the director of undergraduate studies in the Department of Theology.

MEDIEVAL STUDIES

The Minor in Medieval Studies allows students who are committed to other programs of study to pursue interests in the culture of the Middle Ages and to cross the limits of individual disciplines as a means of understanding the changing social, economic, legal, intellectual, and artistic systems of medieval society.

Students may declare their intention to undertake a minor in Medieval Studies to the director of undergraduate studies at any time before the end of their third year. The undergraduate director will then act as their minor advisor and help them select a set of courses that form a coherent program of study, often in conjunction with their major. Students are required to take five courses, including the introductory course and four electives in Medieval Studies drawn from at least two of the affiliated units. One of these electives must be an advanced seminar (4xxxx-level or above). Courses counted toward a student's major may not be used for the minor.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Medieval Institute.* Course descriptions can be found by clicking on the subject code and course number in the search results.

MUSICAL THEATRE

This interdisciplinary minor is meant to engage the student who has multiple interests in Musical Theatre. Some students will structure their program around singing and acting, but others around song-writing, or work as conductor/impresario, or stage directing, or scholarship, etc. Admission to introductory classes will not be based on performance ability.

5 courses (15 credit hours):

3 credits - Musical Theatre History
3 credits of course work in FTT courses
3 credits of course work in MUSIC
3 credits from either FTT or MUSIC, with the Musical Theatre Minor Designation
3 credits for a CAPSTONE PROJECT

Current Department of Film, Television, and Theatre courses for the Musical Theatre minor:

Advanced Performance Techniques
Musical Theatre History (required)
African American Musicals in Theatre, Film, and Television
Musical Theatre Movement/Dance
Performance Techniques
Production and Performance
The Movie Musical
Disney in Film and Culture
Musical Theatre Lab: Workshopping the Musical
Musical Theatre Lab: Analyzing and Creating the Musical

Current Department of Music courses for the Musical Theatre minor:

American Popular Song
Voice Lessons for Non-Majors
Theory for Non-Majors
Intro. To Harmony and Voice Leading
Musicianship I
Musicianship II
Musicianship III
Conducting I
Opera in Production
Opera Workshop
Vocal Pedagogy
Voice Science

PHILOSOPHY, POLITICS, AND ECONOMICS

The minor in philosophy, politics, and economics (PPE) is designed for students with serious interests at the intersection of political theory, political philosophy, and economic theory. Its aim is to help students acquire some fluency in each of the disciplines, and to provide a forum where all three disciplines can be brought to bear on problems which are common or complementary. PPE emphasizes the development of the analytic skills exercised in close reading, cogent writing and clear oral expression. Students are strongly encouraged to engage in undergraduate research. A high percentage of PPE graduates pursue advanced degrees.

The PPE minor is 15 credits, including the 3-credit Justice Seminar, which is the core course of the minor and is required of all concentrators. The minor is open by application only; any student who wishes to take the Justice Seminar must complete the application for the minor. Most of the students who are granted admission to the seminar are PPE-intents. First-years, sophomores and juniors from across the University are welcome to submit applications, regardless of their majors.

The PPE curriculum consists of 15 credit hours usually distributed over four semesters, as follows:

- The Justice Seminar (cross-listed in Philosophy, Political Science, and Economics), an intensive 3-credit-hour seminar that is the gateway to the minor, taken in the fall semester of sophomore or junior year. (3 credit-hours)
- Three 1-credit PPE Colloquia, each devoted either to the critical reading and discussion of one or two major works or to a group project on some contemporary issue(s). The colloquia are normally taken in the three semesters following the Justice Seminar. Special arrangements can sometimes be made for students who wish to participate in a colloquium while studying abroad. (3 credit-hours *in toto)*
- Three approved 3-credit courses from three broad families of electives related to philosophy, political science, and economics. (9 credit hours *in toto)*

Total credit-hours: 15.

PPE students are also encouraged (but not required) to write senior theses in their majors that reflect the interdisciplinary focus of the program.

The Justice Seminar is always offered in the fall semester. An informational meeting about the PPE minor is usually held early in the March of each year, with applications for the minor normally due early in April of the year in which the Seminar will be taken.

Contact: Director Paul Weithman, Department of Philosophy, pweithma@nd.edu.

PHILOSOPHY, RELIGION, AND LITERATURE

Director:
Susannah Monta

The Philosophy, Religion, and Literature minor brings together and amalgamates two formerly existing minors, Philosophy and Literature and Religion and Literature. The new minor is designed for students who want to pursue an interdisciplinary course of studies that focuses on the many intersections among philosophy, religion, and literature. The minor seeks to build bridges between disciplines and modes of thought which have traditionally been in dialogue with one another and which historically have been at the heart of teaching at Notre Dame. The aim is to create a context in which philosophical, religious, and literary approaches to thought and its expression may be studied systematically and in conjunction with each other. This integrative approach to liberal education's foundational subjects resonates deeply with the intellectual values and mission of Notre Dame.

Curricular Requirements. The Philosophy, Religion, and Literature minor will require students to complete 15 credit hours of approved course work. These 15 credit hours will normally comprise at least one three-credit Gateway seminar, three three-credit electives, and a three-credit capstone project.

Gateway seminar. Students are required to take a three-credit Gateway seminar, either in philosophy and literature or in religion and literature. The minor is thus organized around two parallel but intersecting tracks. The purpose of the Gateway seminars, whatever their specific topics may be, is to provide a rigorous introduction to the study of philosophy and literature or religion and literature.

Electives. In addition to the Gateway seminar, students are required to take three other courses that have been approved for the minor. The minor's director will help students identify courses relevant to the minor and to their own individual interests and needs.

Integrating the tracks. Students working primarily in one track are required to take one course in the other. Thus, a student focusing on religion and literature is required to take one course in philosophy and literature. That course may be either the Gateway seminar or another course. If students choose to fulfill this requirement by taking Gateway seminars in both tracks, both seminars will count toward the 15 credit hours needed for the minor.

The capstone project. For the capstone project, each student, working directly with a professor associated with the minor, will write a research essay of approximately 20 pages on a topic that embraces philosophy and literature or religion and literature, or both. Students are encouraged to consult with a professor who is working in a different subject area from the one on which the advisor has expertise. Thus, if a student's advisor is in Theology, that student will be encouraged to consult with a literature professor who has some interest in the student's topic. We recognize that some seniors in the College of Arts and Letters are writing senior theses for their majors. In many cases it is unrealistic to expect such students to write an additional capstone essay. Students in the Philosophy, Religion, and Literature minor who are already writing a senior thesis are allowed to complete the minor by taking a fifth elective course instead of the capstone project, provided that the senior thesis topic in some way resonates with the overall themes of the minor.

Events and Activities. The Notre Dame community already hosts a number of lectures, forums, and one-day seminars relevant to the minor. In addition, the minor will sponsor events and activities such as trips to the opera and theater. Students in the minor are required to attend at least three such events.

PHILOSOPHY, SCIENCE, AND MATHEMATICS

This interdisciplinary minor offers students the opportunity to explore the "big questions" raised by science and mathematics. The minor is particularly intended for students who already have significant scientific and/or mathematical training and wish to pursue related philosophical questions which may not be explored by the courses within their major as well as for students outside the sciences, who would like to combine some serious scientific work with intensive discussions of the big questions raised by contemporary science and mathematics.

Students pursuing the minor in Philosophy, Science, and Mathematics take a Core Seminar offered every fall semester which serves as a gateway course to continued studies. In addition, students will take courses in the philosophy of science, the philosophy of mathematics, and logic. Regularly offered courses in these areas include the following:

Philosophy of Science
- PHIL 43704: Science and Social Values
- PHIL 43722: Ethics and Policy in Technology Management
- PHIL 43708: Bio-Medical Ethics, Scientific Evidence & Public Health Risk
- PHIL 30389: Philosophical Issues in Physics
- PHIL 43718: Scientific Images of Humanity
- PHIL 43720: Historical & Conceptual Foundations of Spacetime Theory
- PHIL 43308: Environmental Justice
- PHIL 43711: The Life and Works of Darwin
- PHIL 43721: The Science-Gender Connection
- PHIL 43715: Philosophy of Science and Public Policy

Logic and Philosophy of Mathematics
- PHIL 43907: Intermediate Logic
- PHIL 43918: History and Philosophy of Logic
- PHIL 43906: Philosophy of Mathematics
- PHIL 43913: Modal Logic
- PHIL 43917: Intuitionism
- PHIL 43912: Between Math and Philosophy
- PHIL 43908: Topics in Philosophical Logic: Set Theory

Details about the minor can be found on the Department of Philosophy website at https://philosophy.nd.edu/majors-minors/philosophy-science-and-mathematics/.

SCIENCE, TECHNOLOGY, AND VALUES

Program Director:
Anna Geltzer, Assistant Director
Reilly Center for Science, Technology & Values

Science and technology play a powerful role in structuring our world, in everything from our physical environment to our culture. A multifaceted understanding of this role is key both for those who aspire to shape our world and for those who want to be successful in it.

The Science, Technology, and Values minor offers students the opportunity to acquire an interdisciplinary understanding of science and technology in modern societies, providing them with analytical and conceptual tools they need to confront the complex questions that arise where science and society intersect.

STV prepares students to pursue a variety of academic and career goals. Students focused on the natural sciences and engineering get to explore the social, political and ethical implications of their chosen fields, while students majoring in business, the humanities and social sciences have an opportunity to study the processes, products and impacts of science and technology.

Students pursuing the minor in Science, Technology, & Values take one Core Course offered each fall semester which serves as a gateway course to continued studies.

STV 20556: Science, Technology, & Values

In addition to a wide selection of interdisciplinary elective courses, the minor offers opportunities for undergraduate research.

Contact information: The Reilly Center, 219 O'Shaughnessy Hall, 574-631-5015, ageltzer@nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Science, Technology and Values*. Course descriptions can be found by clicking on the subject code and course number in the search results.

SPORT, MEDIA, AND CULTURE

Co-Directors:

Annie Gilbert Coleman, Associate Professor of American Studies

Katherine Walden, Assistant Teaching Professor of American Studies

The minor in Sport, Media, and Culture (SMAC) invites students to study sport and issues of representation from a variety of disciplinary perspectives, and gives them the opportunity to apply their learning with an eye towards social justice and the dignity of every human being. SMAC defines media broadly—to include visual art, historical texts, and performing arts as well as print journalism, radio, film, television, and social media—and incorporates analyses of race, gender, sexuality, class, and inequality from across the humanities and social sciences. SMAC is for students interested in analyzing sports, representation, and power; for those seeking careers in sports media or journalism, sports advocacy, or the sports industry; and for students who want to understand their own relationship to sports and media from an Arts and Letters perspective.

The minor consists of at least 15 hours of course credits, including SMAC 30103 Sports and American Culture, 11–12 credit hours of electives, and a 1-credit capstone project designed for and presented to a public audience. SMAC students may choose their electives from a wide range of courses cross-listed with the minor. In addition to standard 3-credit academic courses, students may take up to 3 hours of community engagement (SSLP), CSC seminars, or internship for credit towards the minor. Depending on the student's interest and course of study, the director may approve specific non-cross-listed courses to count towards the SMAC minor. The required capstone project, which asks students to synthesize and reflect upon their work within the minor in some public-facing way, gives students freedom to apply what they have learned according to their individual skills, interests, and professional goals. Projects may include exhibits or live presentations of research, podcasts, videos, print journalism, TED talks, or other forms of public programming.

For more information, see smacminor.nd.edu.

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Mendoza College of Business

The Mendoza College of Business, an accredited member of the AACSB—Association to Advance Collegiate Schools of Business—was established in 1921.

Notre Dame's business school is noted for challenging its students to "Grow the Good in Business™," by placing individual integrity at the heart of every decision, by tackling tough problems and building effective organizations, and by harnessing the power of business to serve the greater good of the global community.

Students who are accepted into the Mendoza College of Business through the admissions process must matriculate into the college no later than the beginning of junior year.

Programs of Study

At the Mendoza College of Business, students should expect challenging academic coursework, an excellent faculty, and many opportunities to interact with corporate executives and industry experts who can immerse them in the realities of today's business world.

A holistic approach to business education springs from the deepest root of Notre Dame and radiates throughout the curriculum. Education involves more than developing just specialized skills, it involves teaching every student to recognize a role of service to the human community.

The business education program at Notre Dame seeks to expand learning beyond traditional silos and to integrate knowledge across business disciplines, in order to promote critical thought. Students develop the broader perspective they will need to lead in a complex, global economy.

The business world has always required people with initiative, a willingness to take risks, and the stamina to thrive in a competitive world. To meet demands for new and better goods and services, leaders must manage operations which are extensive and multi-faceted. The business leader whose job it is to put the work of many specialized people together into a smooth-working whole has traditionally developed business skills by rather accidental means: by knowing instinctively, by learning from experience, or by building upon some specialized body of knowledge.

The purpose of the business program is to focus attention directly on the skills and knowledge required by a leader today. The work is especially appropriate at Notre Dame. The responsibility of each business to its employees, customers, suppliers, owners, and the common good is being recognized and studied with growing intensity.

This responsibility raises ethical issues to which Notre Dame and its graduates should respond in a sound and practical way. The continuing effort to improve the practical application of ethical principles to competent performance in leadership roles is a prime concern of the Mendoza College of Business.

In light of the responsibility of the Mendoza College of Business for guiding students toward a liberal education in the Christian tradition and toward future responsibilities as business administrators, the following mission statement has been formulated:

> *As a leading business school guided by the University's Catholic identity, the Mendoza College of Business seeks to grow the good in business to improve the human condition in an ever-changing society. Through impactful research and educational programs, we contribute to the formation of ethical business leaders who integrate the mind and the heart and have the competence to see and the courage to act.*

Learning Objectives. The educational objective of the undergraduate program in the Mendoza College of Business is to assist and guide students in preparation for lifelong learning, for effective citizenship, and for professional careers as competent and ethical participants in business, government, and other complex organizations. This is accomplished by educating students in the professional area of business while remaining true to the scholarly, liberalizing, and Catholic mission of the college and the University.

The Mendoza College of Business has established the following program learning objectives in support of this mission and objective:

- Be effective problem solvers.
  - Students will gather and analyze relevant evidence to articulate solutions to business problems.
  - Students will analyze business problems in a global context.
- Become effective communicators.
  - Students will produce professional quality business documents.
  - Students will deliver professional quality presentations.
  - Students will work collaboratively to accomplish business objectives.
- Knowledgeable in the field of business.
  - Students will demonstrate foundational knowledge relevant to business.
  - Students will have content knowledge requisite of their academic major.
- Ability to integrate ethics into decision making.
  - Students will evaluate the ethical dimensions of business decisions.

The Program. The educational activities of a university and a college are broader than the mere teaching of courses. Nevertheless, one of the main expressions of an educational plan is its program of instruction. Several features of the program itself and certain fundamental concepts on which it is based deserve special comment.

The College recognizes three distinguishable but interrelated types of education to which future business leaders should be exposed: (1) study in the fields traditionally called liberal arts; (2) a basic understanding of the operation of a business enterprise; (3) a professional concentration in a major for the student's in-depth educational pursuit, which will also provide some preparation for future employment.

The curriculum of the business program is approximately one-half business courses and one-half instruction in traditional liberal studies usually provided by the College of Arts and Letters and the College of Science.

Mendoza College of Business students are introduced to the basic tools of business and the functions of accounting, coding, finance, leadership and strategy, business statistics, marketing, and ethics during their first two years.

In the junior and senior years the student continues his or her studies using the analytical tools developed in the first two years. A student gives emphasis to his or her major and may either add to minimum major requirements or elect other course areas for study.

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Curriculum for the Degree of Bachelor of Business Administration

The College stands ready to accept students who are admitted to Mendoza and have successfully completed the course requirements in the first year as outlined in the University Requirements section of the *Bulletin*. In addition to these requirements, Mendoza College of Business student intents should also complete the following specific courses during the first year:

- Calculus
- Principles of Microeconomics
- At least six credits from the following business courses:

Foundations of Accountancy
Foundations of Finance
Foundations of Marketing
Foundations of Leadership
Foundations of Strategy
Foundations of Statistics
Foundations of Coding
Foundations of Ethical Behavior

By the end of the sophomore year, a Mendoza College of Business student is expected to have completed all the foundations-level business courses noted above. The sequence of completion of courses will vary according to the availability of courses.

The BBA degree requires a total of 122 credits. Of these credit hours, a student must take at least 24 credits in non-business elective courses. Consequently, a student has considerable flexibility in selecting courses that meet his or her particular academic and career plans. Students in the Mendoza College of Business will declare a major in the spring semester of their first year in one of the following majors: accountancy, business analytics, finance, marketing, or strategic management.

The Mendoza College of Business, in partnership with the IDEA Center, also offers an interdisciplinary minor in Innovation and Entrepreneurship to undergraduate students from all colleges and schools. All Mendoza academic departments each offer a minor as well (see department sections). Second majors, minors, and concentrations in subject areas outside the Mendoza College of Business are also available. Students must be able to complete additional majors, minors, and concentrations within their four years of study at Notre Dame. Students should refer to specific departments for opportunities and requirements.

To be eligible for the BBA degree, students must complete a minimum of 61 credits at Notre Dame.

A graduate from the college must have at least a 2.0 cumulative GPA and have accumulated a minimum number of credit hours in the following areas:

The following is a breakdown of course and credit requirements to satisfy the 122 BBA degree credits. Refer to the University Requirements section of this Bulletin for an understanding of how courses satisfy the Core Curriculum "Ways of Knowing."

Moreau First-Year Seminar	2
Writing and Rhetoric^	3
University Seminar	3
Quantitative Reasoning*	3–6
Science and Technology*	3–6
Arts & Literature or Adv Language & Culture*	3
History or Social Science*	3
Integration (or alternate per Univ Req)*	3
Theology*	6
Philosophy (or CAD)*	6
Principles of Microeconomics**	3
Calculus**	3
Foundations of Accountancy	3
Foundations of Finance	3
Foundations of Statistics **	3
Foundations of Coding	3
Foundations of Leadership	1.5
Foundations of Strategy	1.5
Foundations of Marketing	3
Foundations of Ethical Behavior	1.5
Major Courses***	21
Business Broadening Courses*****	9
Non-business electives	24
Free Electives****	varies

^Other Writing-Intensive Course if AP for Writing & Rhetoric

**May also satisfy University Seminar*

***May satisfy Univ. Req. if not AP*

****A minimum GPA of 2.000 is required in the major*

*****Will vary depending on applied AP credit*

******Business courses taken in at least two departments outside major department*

Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

General administration of the undergraduate program is accomplished in the Office of Undergraduate Studies, Room 101 Mendoza College of Business. Advisors are available in this office to counsel students and answer questions concerning university and college requirements/policies. Faculty mentoring for juniors and seniors is available from their respective major departments; however, Room 101 advisors will continue to provide general advice on college and university issues. In addition to the University pre-law advisor, Mendoza offers pre-law advising to current undergraduate business students.

Normal semester course load for sophomores is 15–17.5 hours; for juniors and seniors, 15–19 hours. The minimum semester course load for all students is 12 hours. Normally, a cumulative and recent term grade point average of 3.4 or higher is required to obtain permission to carry an overload. Interested students should contact the Office of Undergraduate Studies for specific information.

Students may elect to fill free elective or non-business elective requirements to include 1-, 1.5-, or 2-credit-hour courses, AP credit, or Credit by Exam. The college accepts a maximum of 30 credits through AP and/or credit by exam, including no more than six credits through AP and/or credit by exam in any one language, toward degree-seeking credits. AP credit cannot be applied toward University core curriculum requirements in the degree.

A maximum of three credit hours of workshops, service, activity, or experiential learning courses can be applied as free elective credit toward the 122 degree credits. Exceptions may be made if required for a second major. If students complete more than three credit hours of these courses, they will still appear on a student's transcript, but the extra credits will not count toward the degree requirements.

Pass-Fail. With permission from their academic advisor and approval of the assistant dean, juniors and seniors may elect one course per term under the pass-fail option. Only non-business elective courses may be taken pass-fail. No business courses, required courses, or courses in a student's second major or minor (other than the first course taken in a minor track) may be taken pass-fail even though taken as a free elective. The selection of a course as pass-fail must be made during the first six days of the semester and is irrevocable. Note: to be eligible for Dean's List status, a student must have a minimum of 12 graded credits for the semester.

Directed readings or special studies are not part of a standard curriculum for students in the Mendoza College of Business and cannot duplicate or substitute for an existing course. Directed readings or special studies are rare exceptions to established coursework, designed to support an area of research or study that is of mutual interest to a faculty member and a student. These courses contain advanced objectives beyond those covered in regularly scheduled courses—not introductory material or material taken from the popular literature that should more properly be considered "self-improvement" than academic in nature. A directed reading/special studies course will not satisfy a University, College, or major requirement. Directed readings or special studies outside of a student's major in business may count as free elective or non-business elective credit only. A student may register for no more than three credit hours of directed readings or special studies in any given semester. No more than a maximum of nine directed reading or special studies credit hours may be applied toward the 122-credit-hour BBA degree requirements.

Study Abroad

Students from any of the majors in the Mendoza College of Business may participate in study abroad programs.

Notre Dame has made it possible for students to earn credits toward graduation in study abroad programs. Travel, direct personal experience of another language and culture, and study in another tradition all broaden and deepen the liberal education of the whole person, to which the University has always been committed.

Qualified undergraduates can spend all or part of their sophomore or junior year in such places as Angers and Paris, France; Berlin and Heidelberg, Germany; Dublin and Galway, Ireland; St. Andrews, Scotland; London and Norwich, England; Fremantle, Perth, and Sydney, Australia; Bologna and Rome, Italy; Puebla, Mexico; Nagoya and Tokyo, Japan; Seoul, South Korea; Santiago, Chile; São Paulo, Brazil; Beijing, Hong Kong, and Shanghai, China; Toledo, Spain; Jerusalem, Israel; Athens, Greece; Amman, Jordan; and Singapore. New program locations are periodically added.

For further information and advice on international study, students of the Mendoza College of Business may contact the Office of Undergraduate Studies, Room 101 Mendoza College of Business, and/or the director of the Study Abroad Programs, 105 Main Building.

Student Awards and Prizes

College Level Awards

The Dean's Award. This award is given to a senior in the Mendoza College of Business who ranked in the top 5% of their graduating class and demonstrated outstanding leadership and service to the University and the College.

The Eugene D. Fanning Award. Given to a senior man and woman who demonstrate exceptional achievement in business communication; excellence in writing, speaking, listening, and interpersonal communication; and who demonstrate leadership potential, initiative, integrity, and respect for the dignity and rights of others.

The Hamilton Awards. Founded by Robert L. Hamilton '34, Racine, Wis., these awards are given to the senior in each of the five departments of the college with the highest cumulative grade point average.

The Charles G. Morrow Award for Business Excellence. This award was established by the five children of the late Charles G. Morrow, Class of 1938, in honor of his contributions to Notre Dame and the business community. Given to a graduating senior in the Mendoza College of Business, this award recognizes business excellence through documented service, leadership, and personal integrity.

Accountancy Awards

Accountancy Chairman Award. An annual award provided to an accountancy senior who demonstrates outstanding service to the Department of Accountancy.

The Accountancy Faculty Award. This award recognizes an outstanding senior in the Department of Accountancy in the Mendoza College of Business. It is given to an outstanding senior with one of the highest cumulative grade point averages.

The William Barth Award. This award is designed to assist students who have accepted a full-time volunteer experience after they leave Notre Dame or who plan to work for a not-for-profit organization.

Peter Brady Award. Established to honor past faculty member Peter Brady, this award is given in recognition of outstanding academic performance.

Accountancy Excellence Awards. Given annually to up to 25 sophomores who declare accountancy as their major and have demonstrated outstanding academic achievement. The awards are funded by annual gifts from Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers.

Elmer Layden Awards. Given annually to graduating accountancy seniors in recognition of academic achievement. The awards are funded by the Elmer Layden Jr. Endowed Fund.

Brother Cyprian Awards. Given annually to graduating accountancy seniors in recognition of academic achievement. The awards are granted in honor of Holy Cross Brother Cyprian O'Hare ("Brother Zip"), who helped to launch Notre Dame's accountancy education program in 1895 and later served as department chair.

James Dincolo Awards. Given annually to graduating seniors in each major in recognition of academic achievement. The awards honor former accountancy professor James Dincolo and are funded by an endowment in his name.

Finance Awards

Paul F. Conway Award. Given to a senior in the Department of Finance who embodies those characteristics that define our tradition of excellence: a person of keen intellect who enriches the ideals of Notre Dame.

Department of Finance Distinguished Student Award, in Honor of Raymond P. Kent and LeClair Eells. Given to a senior in the Department of Finance who demonstrates exceptional performance and leadership as a finance major.

Department of Finance Scholar Award, Sponsored by Jim and Margaret Wade. Given to seniors in the Department of Finance who demonstrate exceptional performance in the finance curriculum.

Frank K. Reilly Family Outstanding AIM Analyst Award. Presented to the analyst in each Applied Investment Management cohort who make the most significant contribution to the AIM program, through both the quality of their own work and their contributions to the overall course and the broader portfolio management team.

Marlene Wasikowski Outstanding Service Award. Given to a senior in the Department of Finance in recognition of outstanding service to the Department of Finance and other finance majors.

Information Technology, Analytics, and Operations Awards

The Business Technology Award. Given to the outstanding Business Technology senior in the Department of Information Technology, Analytics, and Operations.

The Justin Harris Brumbaugh Memorial Award. Given annually to the graduating ITAO student who has excelled academically and has been selected by the graduating seniors as best representing the unique and enduring spirit of Notre Dame.

Management and Organization Awards

The Management & Organization Department Student Service Award. This award honors students who embody the spirit of Notre Dame through the provision of extraordinary and selfless service to strategic management students and the Mendoza community.

The Robert Vecchio Leadership Award. Established in 2010, this award honors the memory of Bob Vecchio, former Chair of the Management &

Organization Department. This award is given at the discretion of the faculty to a strategic management student who embraces the spirit of Notre Dame and has excelled in developing leadership skills.

Marketing Awards
David A. Appel Award. The award is given to a marketing student engaged in significant community service at Notre Dame and in the greater Michiana area.

Wesley C. Bender Award for Outstanding Performance in Marketing. An annual award given to the senior marketing major with the highest grade point average in marketing courses. The award is named for the first chairman of the Department of Marketing, Wesley C. Bender.

Yusaku Furuhashi Award, in honor of an esteemed colleague who was a pioneer in the area of international marketing. The award will be given on a calendar year basis to a student who, in the estimation of the faculty, writes the best essay capturing the marketing insights gained by the semester abroad experience. The winner each year may be either a junior or senior, depending upon the dates spent overseas.

Paul D. Gilbert Award for Leadership. An annual award given to a marketing senior for overall leadership in extracurricular departmental activities. The recipient is selected by the faculty of the Department of Marketing.

John R. Malone Award. An annual award given to the junior marketing major with the highest overall grade point average.

The Robert M. Satterfield Award. An annual award given to a senior marketing student for bringing enthusiasm, integrity, and spirit of teamwork to the classroom.

Business Oriented Student Organizations and Activities

Student academic organizations are supported and encouraged by the administration and the faculty. These associations are actively managed by student officers. Members of the faculty serve in advisory capacities.

Honor Societies.
Beta Gamma Sigma. The mission of the International Honor Society Beta Gamma Sigma is to encourage and honor academic achievement in the study of business, to cultivate and celebrate leadership and professional excellence, to advance the values of the Society, and to serve its lifelong members. Undergraduate membership in this organization is restricted to the upper 10 percent or less of the senior class and the upper 5 percent or less of the junior class for all full-time students. Faculty membership is limited to those with tenure in the Mendoza College of Business at Notre Dame.

Beta Alpha Psi. Accountancy majors who have demonstrated outstanding scholastic ability and the personal characteristics requisite to professional status are eligible for membership in Beta Alpha Psi, the national professional and honorary accounting society. The purposes of this society are to encourage and foster the ideal of service as the basis of the accounting profession; to promote the study of accountancy and its highest ethical standards; to act as a medium between professional persons, instructors, students, and others who are interested in the development of the study or profession of accountancy; to develop high moral, scholastic, and professional attainments in its members; and to encourage cordial interaction among its members and the profession generally.

American Advertising Federation Chapter. The purpose of the ACND is to provide and promote a better understanding of the functions of advertising and of its values, to stimulate and encourage advertising professionalism through advertising education, career exploration in advertising, to follow and understand the trends of the advertising industry, to develop the individual abilities of its members, and to ultimately possess a better understanding of the advertising industry as a whole.

Asia Pacific Business Club. The purpose of APBC is to provide the Notre Dame community with a platform to share knowledge about business in Asia Pacific, explore career opportunities in Asia Pacific and other regions, and support long-temrm relationships among its members, ND alumni, and Asian business leaders.

Association of Latino Professionals in Finance and Accounting (ALPFA). ALPFA is the premier business organization for expanding opportunities for Latino leadership in the global market. At Notre Dame this organization is designed to provide networking, career building, and leadership opportunities to diverse students who intend to major in accountancy, finance or information technology management. ALPFA also provides scholarships, internships and other career advancing opportunities to diverse students.

Business Action in Social Entrepreneurship (BaseND). The purpose of BaseND is to build a firm business foundation for our members and partners through solving real business problems for local and global non- and for-profits; to create positive social change for the community; and to provide career resources and mentorship to members.

Corporate Finance Club of Notre Dame. The primary purpose of this organization is to advocate the corporate finance industry and assist members in networking, personal branding, and the interviewing process to obtain internships and full-time employment. The club shall seek to supplement the classroom education of members and broaden their awareness of the financial world's theories, principles, and practices.

Entrepreneurship Society of Notre Dame. The purpose of the Enntrepreneurship Society of Notre Dame is to foster the entrepreneurial spirit and ability of Notre Dame undergraduate students through coordinating programs which emphasize entrepreneurship. The mission of the club is to coordinate guest speakers throughout the year, to devise new and creative ways to raise money while providing real experience in starting new ventures, and to provide resources for any student interested in starting a new venture but lacking the resources necessary.

Information Technology Management Club, Notre Dame (ITMND). The purpose of ITMND is to pool the resources of all persons interested in the field of Information Technology Management (ITM) to more fully develop the academic, career, and social potential of all individuals in this dynamic field of study.

Innovation for Impact Club. The purpose of Innovation for Impact is to foster the development of innovation and design thinking concepts through meaningful work on real world assignments through working with global organizations on world changing projects, giving students the opportunity to use their education and platform to help communities facing specific social concerns. The club aims to work with organizations that are attempting to solve issues for the people in their communities, but are lacking the resources and business acumen to implement concrete solutions to do so.

Investment Club of Notre Dame du Lac. The club was established to serve as an opportunity for all undergraduate students who are interested in the field of investments to develop and/or increase their knowledge of this special area of finance

through activities designed as rewarding educational experiences.

Marketing Club. The purpose of the University of Notre Dame Marketing Club is to provide a medium for the interaction of all those interested in marketing. The club strives to go one step beyond the classroom in terms of learning what marketing really constitutes by organizing speakers, field trips, and social interaction between students and faculty. It is a resource for connecting the students throughout their education in and out of the classroom.

MoneyThinkND. MoneyThinkND seeks to promote financial literacy by placing college mentors in South Bend high schools to teach personal finance lessons. The goal is to help build the financial health of Americans by equipping youth and young adults to believe in themselves, navigate the financial decisions of adulthood, and achieve financial independence.

National Association of Black Accountants (NABA). The Student Chapter of NABA of Notre Dame shall unite through membership accounting students who have similar interests and ideals, are committed to academic and future professional excellence, have a sense of professional and civic responsibility, and are concerned with enhancing opportunities for minorities in the accounting profession.

Notre Dame Accounting Association (NDAA). NDAA aims to build a strong community for both current and prospective accounting majors and minors. As a student-led organization, NDAA acts as an avenue for club members and their peers to participate in social gatherings/events, interact with faculty, and meet other students and young professionals with similar career objectives. The club also includes opportunities to network with alumni and others pursuing careers in accounting and business through trips, speaking engagements, and informal social events.

Smart Women Securities at Notre Dame. Smart Women Securities at Notre Dame seeks to provide undergraduate women with the tools they need to become financially independent and knowledgeable about their investments.

By working on an investment project, our goal is to foster an environment in which members develop personal aspirations along with collaborative skills and a business foundation that inspires confidence to participate in the financial world.

Students Consulting for Nonprofit Organizations Notre Dame. The mission of SCNOND is to develop the South Bend community through pro-bono consulting engagements with local nonprofit organizations through the unique experiences and gain academic knowledge of our student members. The secondary mission of SCNOND is to develop our student members for future career endeavors through consulting projects with nonprofit organizations.

Student International Business Council (SIBC). The SIBC seeks to fulfill its vision of "Peace through Commerce" by interacting with global companies and organizations, while educating its members and the Notre Dame community on the different aspects of international business. The council encourages students from all majors and interests to become active members of the organization to work on semester projects with the hope of bringing a variety of perspectives to issues regarding international business and economics.

Undergraduate Women in Business (UWIB). The Undergraduate Women in Business Club is committed to the development of women's roles as students of business and as leaders in business-related fields. The club is designed to build a stronger sense of community among undergraduate women to aspire to business-related professions through events, including an annual professional development conference, highlighting the many opportunities available to them.

Unleashed. We believe that educating individuals early in life about the importance of impact investing will encourage continuous involvement and contribution to all related fields. Unleashed is an organization for people from all disciplines, and intends to collaborate with other universities and colleges to learn from each other's experiences. Our members are challenged to think in new ways and explore alternative financial solutions to existing social issues.

Wall Street Club. Through a network of current students and alumni, we provide resources and mentoring for ND students who wish to learn about careers on Wall Street. The club works closely with the Investment Office, Career Center, alumni, and senior mentors to help students network, learn about opportunities, and prepare for a successful career on Wall Street.

Accountancy

Deloitte Professor of Accountancy & Deloitte Foundation Accountancy Department Chair:
Brad Badertscher
Notre Dame Alumni Professor of Accountancy:
Peter Easton
Vincent and Rose Lizzadro Professor of Accountancy:
Hal White
KPMG Collegiate Professor of Accountancy:
H. Fred Mittelstaedt
Associate Professor and Director of the Master of Science in Accountancy (MSA):
Jim Seida
Associate Professors:
Jeff Burks; John Donovan; Brandon Gipper; Yadav Gopalan; Andy Imdieke; Stephannie Larocque; Jeff Miller; Sandra Vera-Munoz; Jessica Watkins
Assistant Professors:
John Aland; Ilona Bastiaansen; Laurel Mazur; Madeline Thompson; Lauren Vollen
Teaching Professor and Director of Foundation of Business Minor:
Laura Hollis
Teaching Professors:
Brian Levey; Mike Meyer; Tonia Murphy; Jamie O'Brien
Associate Teaching Professor, Assistant Department Chair and Director of Undergraduate Studies:
Colleen Creighton
Associate Teaching Professors:
Elizabeth Chorvat; Claire Donovan; Mike Favorite; Tim Morrison; Keith Urtel

Program Objectives. The AACSB separately-accredited Department of Accountancy provides outstanding accounting educational experiences for its students by (a) complementing and supporting the tradition of liberal arts/general education at Notre Dame, (b) adhering to the objectives of the undergraduate program of the Mendoza College of Business, and (c) developing and continuously improving an innovative accounting curriculum for successful careers as accounting professionals and business leaders. The curriculum focuses on critical thinking/analysis, research, professionalism, teamwork, and communication.

The department provides students with the skills and knowledge necessary to succeed in accounting-related careers. The department also supports the activities of the Meruelo Family Center for Career Development by (a) maintaining an outstanding record of placing high percentages of graduates with international accounting firms (Deloitte, EY, KPMG, and PWC) and other large organizations such as Accenture, Alphabet (Google), Amazon, Andersen, Bain, Boeing, Crowe, and Grant Thornton, among others; and (b) supporting student desires to pursue other postgraduate options, including graduate education and volunteer work.

Major Program of Studies. The accounting major sequence begins with Foundations of Accountancy (ACCT 20100). This course, normally taken in the freshman year, is required of all business students and is designed to provide a broad introduction to accounting concepts, the profession of accountancy and the role of accounting in society.

Students choosing the accountancy major must complete the following Department of Accountancy requirements:

Required of all Accountancy Majors:

ACCT 20200. Accounting Analysis for Planning and Control
ACCT 30110. Accounting Measurement and Disclosure I
ACCT 30120. Accounting Measurement and Disclosure II
ACCT 30280. Data Analytics in Accounting

Accountancy Majors are also required to take three (3) of the following courses:

ACCT 30160. Corporate Sustainability Accounting & Reporting
ACCT 30210. Strategic Cost Management
ACCT 30300. Accounting Information Systems
ACCT 40130. Accounting for Mergers & Acquisitions
ACCT 40280. Advanced Analytics for Accounting/ Finance
ACCT 40510. Audit and Assurance Services
ACCT 40610. Federal Taxation
ACCT 40620. Taxation of Corporations & Shareholders
ACCT 40840. Information Flows in Capital Market Disclosure & Academic Research

Double Major Opportunities within Mendoza. In addition to opportunities outside Mendoza, interested students may pursue a double major combining Accountancy with Finance, Marketing, or Strategic Management. Students pursuing any of these double majors would complete all of the requirements of both majors and may be required to take specific broadening courses. For more information, see the Department of Accountancy and the Mendoza Office of Undergraduate Studies.

The 150-Hour Rule for CPA Certification. Typically, 150 hours of college credit with an accounting concentration are necessary to be licensed as a CPA. The rules vary across states and students planning to sit for the CPA exam should work closely with the department's CPA Advisor. Most students meet the 150-hour requirements through AP credit and overloads during their four-year undergraduate degree. Notre Dame also offers a one-year Master of Science in Accountancy program to help our students meet the 150-hour requirement as well as other state-specific course requirements. Students can earn the BBA and MSA degrees in 4½ years (9 semesters).

Minor Program of Studies. The accounting minor sequence, available to non-Business majors, begins with Foundations of Accountancy and Accounting Analysis for Planning and Control (ACCT 20100 and 20200). These courses are designed to expose students to a broad introduction of accounting concepts, the profession of accountancy, and the role of accounting in society. Students must also complete Measurement and Disclosure I (ACCT 30110) or Corporate Financial Accounting (ACCT 30100) and two additional accounting courses from the following menu:

ACCT 30120. Measurement and Disclosure II
ACCT 30210. Strategic Cost Management
ACCT 30280. Data Analytics in Accounting
ACCT 40280. Advanced Analytics for Accounting/ Finance
ACCT 40510. Audit and Assurance Services
ACCT 40610. Federal Taxation
ACCT 40620. Taxation of Corporations & Shareholders

The minor is designed to enhance skills obtained in the student's major and broaden career opportunities.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Accountancy.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Computer Science and Business Administration (CSBA)

Faculty Director:
Mike Chapple, Teaching Professor of Information Technology, Analytics, and Operations
Program Website:
https://mendoza.nd.edu/undergraduate/computer-science-dual-major/

Faculty
The Computer Science and Business Administration (CSBA) program is interdisciplinary by nature and benefits from the scholarly contributions of a large number of Notre Dame faculty representing an array of academic departments.

Program Overview
The Computer Science and Business Administration (CSBA) program offers an interdisciplinary curriculum designed for students who wish to combine a comprehensive business education with a rigorous foundation in computer science. Students earn a Bachelor of Business Administration (BBA) degree with a primary major in business and a secondary major in computer science, administered jointly by the Mendoza College of Business and the Department of Computer Science and Engineering.

This dual-major pathway prepares graduates to lead in a technology-driven world, equipping them with both the technical expertise of a computer scientist and the strategic insight of a business professional. The program is designed for highly motivated students interested in careers at the intersection of technology, analytics, innovation, and entrepreneurship.

Program Requirements
Students in the CSBA program must declare a primary major in the Mendoza College of Business (Accountancy, Business Analytics, Finance, Marketing, or Strategic Management). During their course of study, students must earn a minimum of 122 credit hours and complete the following requirements:

1. *Completion of University Core Curriculum requirements.* CSE 10001 may not be used to fulfill the University Science & Technology core requirement, due to its strong similarity in coverage to CSE 20311.
2. *Completion of Mendoza College of Business core requirements.* (37 credits)
3. *Completion of all requirements for a major in the Mendoza College of Business* (Accountancy, Business Analytics, Finance, Marketing, or Strategic Management)
4. *Completion of CSE-specific mathematics requirements* (10 credits):

a. MATH 10550 Calculus I or MATH 10350 Calculus A (Note: Students are strongly encouraged to take Calculus I in preparation for Calculus II later in the program. However, students who have already completed Calculus A may use that as the prerequisite for Calculus II.)

b. MATH 10560 Calculus II

c. CSE 20110 Discrete Mathematic

d. One additional mathematics course from the list below:

i. MATH 20550 Calculus III

ii. MATH 20610 Linear Algebra

iii. MATH 20580 Linear Algebra with Differential Equations

iv. Petitions to accept other Math or ACMS courses for this requirement will be considered, but introductory mathematics courses will generally not be approved. Restrictions (e.g., credit cannot be granted for both Math 20610 and Math 20580) will apply.

5. *Completion of Computer Science and Engineering coursework* (29 credits)

a *17 hours of required courses:* CSE 20311: Fundamentals of Computing, CSE 20312: Data Structures, CSE 20289: Systems Programming, CSE 30151:Theory of Computing, CSE 40113: Design and Analysis of Algorithms

b. *12 hours (typically four courses) of CSE electives:* All electives must be taken at the 30000 level or higher, and all associated prerequisite requirements must be satisfied. Students are expected to make elective course selections in consultation with their academic advisor, reflecting their interests and, where possible, facilitating intellectual points of contact between computer science and their business major.

6. *Completion of CSBA-specific requirements* (6 credits)

a. Technology in Business Seminar I, II, and III (3 credits)

b. Business and Virtue in the Digital Age (3 credits)

Admission

Students may be admitted directly to the CSBA program upon admission to Notre Dame or students may apply to the CSBA program in the spring of their first year of study. Students applying to the program must either already be enrolled in the Mendoza College of Business or apply to transfer to the college concurrently with their CSBA application. Applicants are competitively selected for a limited number of slots based on an essay or short video and first year performance. Further information about the application process can be found at the program website.

Finance

Finance Department Chair and AIM Alumni Collegiate Professor of Finance:
Shane Corwin
Martin J. Gillen Dean and Bernard J. Hank Professor of Finance:
Martijn Cremers
Howard J. and Geraldine F. Korth Professor of Finance:
Zhi Da
C.R. Smith Professor of Finance:
Timothy Loughran
John W. and Maude Clarke Professor of Finance:
Paul Schultz
Professors:
Robert Battalio
Associate Professor and Academic Director of the Master's of Science in Finance:
D. Katherine Spiess
William and Cassie Daley Associate Professor of Finance:
Benjamin Golez
Associate Professor and Faculty Director, Notre Dame Institute for Global Investing:
Andrea Tamoni
Associate Professors:
Marco Giacoletti; Sophie Shive; Rafael Zambrana
Assistant Professors:
Huaizhi Chen; Johnathan Loudis; Ben Matthies; Stefano Pegoraro; Leandro Sanz; John Shim; Chen Wang; Jun Yang; Michal Zator
Teaching Professor and Nolan Professorship for Excellence in Undergraduate Instruction:
Carl Ackermann
Teaching Professor and Associate Dean for the Notre Dame MBA:
Gianna Bern
Teaching Professor and Associate Dean for Undergraduate Studies and Specialized Master's Programs:
Kristen Collett-Schmitt
Teaching Professor, Assistant Department Chair, and Director of Undergraduate Studies:
Jim Leady
Teaching Professors:
Walter Clements; Margaret Forster; David Hutchison
Wade Family Associate Teaching Professor and Associate Faculty Director, Notre Dame Institute for Global Investing:
Jason Reed
Associate Teaching Professors:
Jeff Bacidore; John Stiver
Adjunct Associate Teaching Professor:
Howard Lanser

Programs of Study.

The Finance Department offers a major in finance and a minor in finance.

Finance Major.

The finance major equips students with the solid base of knowledge and skills necessary for entry into a wide range of financial careers. All students enrolled in the Mendoza College of Business are required to take FIN 20150 Foundations of Finance during their first or second year; this introductory finance course provides an overview of both financial analysis tools and the issues encountered by a firm's financial manager. Finance majors must complete FIN 20150 Foundations of Finance with a grade of C or higher and this course cannot be repeated for a higher grade. All Mendoza students are also required to take three broadening courses from at least two different Mendoza departments outside of their major. For Finance majors, one of these broadening courses must be ACCT 20200. In addition to the courses required of all candidates for the degree of bachelor of business administration, finance majors are required to take 21 credits offered by the finance department, including three required core courses and 12 elective credits. The three core courses are ACCT 30100 Corporate Financial Reporting, FIN 30400 Corporate Finance, and FIN 30600 Investment Theory. Students interested in pursuing a career in corporate finance or CPA certification are encouraged to take the two-course sequence ACCT 30110 & 30120 in place of ACCT 30100. The 12 credits of electives are selected from among the specialized 40000-level finance courses offered by the department. These elective courses can be tailored to meet the student's individual interests and are designed to equip students with the knowledge to progress in whatever area of business they choose upon graduation. Graduates of the department are currently pursuing successful careers in many areas of business, including investment banking, investment management, consulting, commercial banking, and corporate financial management, among others.

Double Major Opportunities within Mendoza.

In addition to opportunities outside Mendoza, interested students may pursue a double major combining Finance with Accountancy, Marketing, or Strategic Management. Students pursuing any of these double majors would complete all of the requirements of both majors and may be required to take specific broadening courses. Finance majors adding a double major in Accountancy would also need to take the two course sequence ACCT 30110 & 30120 in place of ACCT 30100. For more information, see the Department of Finance and the Mendoza Office of Undergraduate Studies.

Finance Minor.

Mendoza students interested in finance may consider pursuing the Finance Minor. This minor is available to all non-finance majors within the Mendoza College of Business and provides an opportunity to develop knowledge and skills related to financial markets, financial analysis, investment analysis, and valuation, among other areas. These skills will help to better prepare students for a wide range of business careers. The finance minor requires 15 credit hours beyond a student's primary Mendoza major, including FIN 30400 (Corporate Finance), FIN 30600 (Investments), two finance electives (6 credits), and either ACCT 20200 (Accounting Analysis for Planning and Control) or ACCT 30100 (Corporate

Financial Reporting). FIN 30400 and FIN 30600 can be used to satisfy the broadening course requirements under the Mendoza Core Curriculum. ACCT 20200 can also be used to satisfy the broadening course requirement for non-accounting majors. As is the case for a finance major, all students pursuing a finance minor must earn a grade of C or better in FIN 20150. Applications for the minor will be considered each fall and spring. For more information on the application process, course requirements, and available finance electives, see the Department of Finance or the Mendoza Office of Undergraduate Studies.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found at the department's website https://mendoza.nd.edu/research-faculty/academic-departments/finance/finance-undergraduate-courses/ as well as the Registrar's class search tools available through insideND.

Information Technology, Analytics, and Operations

Department Chair and Jack and Joan McGraw Family Professor of ITAO:
Corey Angst
James H. Sweeny III and Alicia Sweeny Collegiate Professor of ITAO:
Nicholas Berente
Edward Frederick Sorin Society Professor of ITAO:
Ken Kelley
Joe & Jane Giovanini Professor of ITAO, and Academic Director of the Ph.D. Program in Analytics:
Ahmed Abbasi
Fred V. Duda Professor of Business:
Sarv Devaraj
William P. and Hazel B. White Technology and Ethics Collegiate Professor of ITAO:
Kirsten Martin
Greg and Patty Fox Collegiate Professor of ITAO:
Alfonso Pedraza-Martinez
Professors:
Daewon Sun; Heng Xu; Nan Zhang
Associate Professors:
Sriram Somanchi; Katie Wowak; Zifeng Zhao
Assistant Professors:
Francis Bilson Darku; Jeff Cai; Eojin Han; Cam Kormylo; John Lalor; Junghee Lee; Shawn Qu; Yoonseock Son; Margaret Traeger; Yang Yang; Chengcheng Zhai
Teaching Professor, and Academic Director of Computer Science/Business Program:
Michael Chapple
Teaching Professors:
Robert Lewandowski; Jennifer Waddell
Associate Teaching Professors, and Academic Co-Directors of the Master of Science in Business Analytics Residential Program:
Seth Berry; Sharif Nijim
Associate Teaching Professor, and Academic Director of the Global EMBA Program:
Brandon Erlacher
Associate Teaching Professors:
Martin Barron; Xiaojing Duan; Frederick Nwanganga
Assistant Teaching Professor, Assistant Department Chair, and Director of Undergraduate Studies:
Joe Ke
Assistant Teaching Professor:
Josephine Akosa

Programs of Study.
The IT, Analytics, and Operations Department offers a major in Business Analytics, and a minor in Business Technology and Analytics.

Business Analytics Major
The Business Analytics major prepares students to be data-driven problem solvers and decision makers in an increasingly digital world. Massive datasets exist in firms and other repositories; meaningful, extractable insights exist within them. Students who study Business Analytics will learn how to conceive of the right questions to ask as well as the correct techniques to deploy to form a coherent story based on the data. Students will use cutting-edge tools and techniques to execute their research plans. The curriculum includes coursework on: data management, data mining, predictive analytics, machine learning, visualization, unstructured data, text mining, and other analytic techniques. Students with these skills will be in high demand in all disciplines, including HR, marketing, finance, accounting, IT, and consulting, as well as across a wide variety of firms.

BAN Required Courses

ITAO 30160. Conveying Visual Data Insights	3.0 hrs.
ITAO 30220. Predictive Analytics	3.0 hrs.
ITAO 30230. Data Management	1.5 hrs.
ITAO 40150. Simulation and Optimization	1.5 hrs.
ITAO 40230. Data Analysis with Python	1.5 hrs.
ITAO 40250. Unstructured Data Analytics	1.5 hrs.
ITAO 40420. Machine Learning	1.5 hrs.

Complete 7.5 additional credits from:

ITAO 30250. Data Wrangling with R	1.5 hrs.
ITAO 30620. Digital Transformation	1.5 hrs.
ITAO 40430. Customer Engagement Analytics	1.5 hrs.
ITAO 40450. Data Acquisition	1.5 hrs.
ITAO 40510. Ethics of Data Analytics	1.5 hrs.
ITAO 40515. Auditing AI	3.0 hrs.
ITAO 40520. Sports Analytics	1.5 hrs.
ITAO 40530. Human Performance Analytics	1.5 hrs.
ITAO 40540. Survey of Software Engineering	1.5 hrs.
ITAO 40550. Society and Networks	1.5 hrs.
ITAO 40570. Urban Analytics	3.0 hrs.
ITAO 40575. Pricing Analytics	3.0 hrs.
ITAO 40730. Cloud Computing	3.0 hrs.
ITAO 40850. Analytics Capstone	3.0 hrs.
ITAO 40860. Early Bridges to Data Science	3.0 hrs.
ITAO 50850. Designing for Human-Centered AI.	
ITAO 50860. Human-Centered Measurement, Design, & Analysis.	

Business Technology and Analytics Minor
The Business Technology and Analytics minor (MBTA) is designed to help prepare students to become leaders in the use of technology and analytics for the benefit of organizations and society. This program of study focuses on educating students about the development and use of information systems and data analytics work flows to support decision making and problem solving. The program also addresses managerial issues encountered in the introduction of such systems in organizations, and how they can be used to gain competitive advantage. The program consists of 15 credit hours and has one required course, Analytics Workflows with Power BI (ITAO 30100). The remaining 12 credit hours consist of relevant elective courses that are sourced by multiple departments across colleges. Applications for the minor open each fall and spring.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found at https://mendoza.nd.edu/itao-undergraduate-courses/ as well as on the Registrar's class search tools available through insideND.

Management and Organization

David E. Gallo Professor of Business Ethics and Department Chair:
Ann E. Tenbrunsel
Associate Teaching Professor, Assistant Department Chair, and Director of Undergraduate Studies:
Jennifer L. Cronin
Franklin D. Schurz Professor of Management, and Academic Director of the PhD Program in Management:
Jason A. Colquitt
Ray and Milann Siegfried Professor of Entrepreneurship:
Dean A. Shepherd
Professors:
J. Michael Crant; Cindy Muir
Associate Professors:
John Busenbark, Michael Mannor; Amanda Sharkey; Oliver Williams; Adam Wowak
Assistant Professors:
Casher Belinda; O. Dorian Boncoeur; Timothy Hubbard; Michael Rosenblum; Brittany Solomon
Teaching Professor and Director of the Powerful Means Initiative and Undergraduate Studies for the Impact Consulting Minor:
Wendy Angst
Teaching Professor, and the Arthur F. and Mary J. O'Neil Director of the Fanning Center for Business Communication:
Amanda McKendree
Teaching Professor, and Director of Undergraduate Studies for the Minor in Innovation and Entrepreneurship:
Samuel Miller
Teaching Professors:
Joseph Holt; Jessica McManus Warnell; James S. O'Rourke IV
Associate Teaching Professor, and Academic Director of Leadership Development:
Christopher Adkins
Associate Teaching Professor, and the St. André Bassette Director of the Master of Nonprofit Administration Program:
Angela Logan
Associate Teaching Professor, and Academic Director of the Master of Science in Management Program:
Kristopher Muir
Associate Teaching Professors:
Timothy Balko; Chad Harms; John Michel; Gerard Pannekoek; Kelly Rubey; Christopher Stevens
Assistant Teaching Professors:
Drew Marcantonio
Instructor:
Danuse Bement

Programs of Study
The Department of Management & Organization offers both an undergraduate major in Strategic Management, and majors in Impact Consulting and Innovation and Entrepreneurship.

Strategic Management Major
The management program prepares students to lead people and processes within both large and small organizations or to advise organizations on those management issues. A particular emphasis is placed on managing within organizations facing the challenges of rapid change and increased competition. The major is designed to provide sufficient flexibility for students to prepare for several career paths by preparing students to think systematically about the processes through which organizations achieve excellence.

Management Major Required Courses (12 hrs.)

MGTO 30300. Business Problem Solving	3.0 hrs.
MGTO 40720. Values-Driven Leadership	3.0 hrs.
ITAO 30100. Intro to Business Analytics	3.0 hrs.

Choose one of the following courses:

MGTO 30623. Communicating for Impact	3.0 hrs.
MGTO 30633. Data Storytelling	3.0 hrs.

Note: ITAO 30100 satisfies one of the three college broadening course requirements. MGTO 30623 satisfies the university writing intensive requirement.

In addition to the courses listed above, all majors must take 9 credit hours of electives. Courses include:

MGTO 30110 / 40110. Futuring: Anticipating Change (Reg / Honors)	3.0 hrs.
MGTO 30200. Management Competencies	3.0 hrs.
MGTO 30310. Innov. & Design Thinking	3.0 hrs.
MGTO 30410. Strategic Human Res. Mgt.	3.0 hrs.
MGTO 30510. Social Entrepreneurship	3.0 hrs.
MGTO 30670. Crisis Communication	3.0 hrs.
MGTO 35310. Innov. & Design Immersion	3.0 hrs.
MGTO 40315. Designing Your Life	3.0 hrs.
MGTO 40320. International Management	3.0 hrs.
MGTO 40612. Applied Impact Consulting	3.0 hrs.

Note: MGTO 30670 satisfies the university writing intensive requirement.

Double Major Opportunities within Mendoza.
In addition to opportunities outside Mendoza, interested students may pursue a double major combining Strategic Management with Accountancy, Finance, or Marketing. Students pursuing any of these double majors would complete all of the requirements of both majors and may be required to take specific broadening courses. For more information, see the Department of Management and the Mendoza Office of Undergraduate Studies.

Impact Consulting Minor
The Mendoza College of Business offers a minor in Impact Consulting for current business students who wish to consult with industry partners around the globe and have a measurable impact on the world's most pressing problems—gender equity, access to education, poverty, climate change, energy, and more. Students work hand-in-hand with those most affected, building foundations as consultants grounded in empathy, collaboration, prototyping, and ultimately implementing ideas. The minor takes students through a purposeful sequence of courses to reflect on purpose, identify and solve wicked problems, immerse in the community, and ultimately build solutions. Simply put, the world becomes the classroom where students apply what they are learning, while practicing project management skills and establishing metrics for sustainable value.

Impact Consulting Minor Courses (15 credits)

Fundamental Courses (9 credits)

MGTO 30300. Business Problem Solving.	3.0 hrs.
MGTO 30310. Innovation & Design Thinking.	3.0 hrs.
MGTO 30317. Designing Your Life.	3.0 hrs.

Experiential Capstone (6 credits)

MGTO 35310. Innovation & Design Immersion.	3.0 hrs.
MGTO 40612. Applied Impact Consulting.	3.0 hrs.

Innovation and Entrepreneurship Minor
The Mendoza College of Business, in partnership with the IDEA center, offers an interdisciplinary minor in Innovation and Entrepreneurship to undergraduate students from all colleges and schools. Through unique, immersive learning experiences, the minor helps students build the entrepreneurial confidence needed to identify emerging opportunities and lead the launch of new ventures. The minor provides students with a high-impact capstone experience in areas such as new venture startup, entrepreneurial finance, or social entrepreneurship. Students who combine a minor in Innovation and Entrepreneurship with one of the traditional majors can find employment via starting a new venture or in corporate areas of research and development, new product development, strategic planning and venture capital investing.

Required Courses (6 credits)

MGTO 30500. Intro. to Entrepreneurship	3.0 hrs.
MGTO 30310. Innov. & Design Thinking (or equivalent)	3.0 hrs.

Elective Courses (select 6 credits)

MGTO 30110 / 40110. Futuring: Anticipating Change (Reg / Honors)	3.0 hrs.
MGTO 30315. Designing Your Life	3.0 hrs.
MGTO 30510. Social Entrepreneurship	3.0 hrs.
MGTO 30520. Funding New Ventures	1.5 hrs.
MGTO 30525. Physical Prototyping	1.5 hrs.
MGTO 30527. Digital Prototyping	1.5 hrs.
MGTO 30535. E'ship: Go To Market	1.5 hrs.
MGTO 30633. Data Storytelling	3.0 hrs.
MGTO 41500. Idea Discovery Lab	3.0 hrs.
CSE 40923. Case Studies in E'ship	3.0 hrs.
ALSF 30147. Media Entrepreneurship	3.0 hrs.
SC 40500. Scientific Entrepreneurship	2.0 hrs.

*Additional electives may be added throughout the year. Please check with your advisor.

Capstone Course (3 credits)

MGTO 40550. New Venture Creation	3.0 hrs.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found at the department's website: mendoza.nd.edu/research-and-faculty/academic-departments/management-organization/ as well as on the Registrar's class search tools available through insideND.

Marketing

Chair of the Marketing Department and Professor of Marketing:
Frank Germann
John T. Ryan Jr. Chair in Business Ethics and Professor of International Ethics:
Jim Otteson
Raymond W. and Kenneth G. Herrick Collegiate Professor of Marketing:
Shankar Ganesan
Professors:
Joseph P. Redden; Joel E. Urbany
Viola D. Hank Associate Professor:
Vamsi K. Kanuri
Howard J. and Geraldine F. Korth Associate Professor:
Shijie Lu
Associate Professor:
John Costello
Assistant Professors:
Chris Bechler; Yixing Chen; Kristen A. Ferguson; Jianna Jin; Keyan Li; André Martin; Joonhyuk Yang
Assistant Research Professor:
Breagin Riley
Teaching Professor:
Susan Bardi Kleiser
Richard J. Huether Associate Teaching Professor, Director of Undergraduate Studies, and Assistant Department Chair:
Mitchell C. Olsen
Associate Teaching Professor:
Kevin Hartman

Program of Study. The Department of Marketing offers an undergraduate major in Marketing and a minor in Marketing.

Marketing Major
Students completing a degree in marketing at Notre Dame should: (1) understand the decision-making processes of buyers and sellers in a market; (2) comprehend the role and impact of marketing in society; (3) apply behavioral models and quantitative tools to the analysis of marketing issues; (4) develop informed marketing strategies; (5) work effectively in a team environment; and (6) respond to the ethical and social responsibilities of marketing practitioners.

All students in the Mendoza College of Business take Foundations of Marketing (MARK 20100) in their freshman or sophomore year. Students who choose marketing as a major must take Consumer and Organizational Buyer Behavior (MARK 30100), Marketing Research (MARK 30120), and five additional marketing electives. Students majoring in marketing may informally elect to pursue one of three tracks: (1) Brand Management to focus on managing brands and the related creation and deployment of effective marketing strategies; (2) Marketing Analytics to focus on the quantitative analysis of marketing decisions; and (3) Digital Marketing to focus on customer engagement through digital channels. Each track consists of at least three elective courses. Students are not required to pursue any specific track(s) and are free to choose any combination of electives within, and across, the three tracks to support their individual interests and career aspirations. More information is available on the Marketing Department website (http://mendoza.nd.edu/research-faculty/academic-departments/marketing/)

The marketing major prepares students for a wide range of opportunities in leading public and private business organizations. Marketing majors are also recruited by non-profit organizations such as educational or art institutions, charitable organizations, and hospitals. The Brand Management track prepares students for careers in brand management, advertising, media planning, consulting, retail marketing, and sales management in Business-to-Business (B2B) and Business-to-Consumer (B2C) firms. The Marketing Analytics track prepares students for careers in marketing and data analysis, marketing research and retail analytics. The Digital Marketing track prepares students for careers in digital marketing, including social media marketing, digital content creation, and digital advertising,

Marketing Minor – Open to all non-Marketing undergraduates
The Marketing Department offers a 15-credit minor in Marketing to both non-Marketing Mendoza students and non-Mendoza students. The minor provides access to a subset of the Marketing major's curriculum by allowing students to take any course from the Marketing Analytics and Digital Marketing elective tracks, thereby helping students prepare for these tracks' associated employment opportunities.

Required courses

MARK/MDMK 20100. Foundations of Marketing 3.0 hrs.
MDMK 30100. Consumer and Organizational Buyer Behavior AND/OR
MDMK 30120. Marketing Research 3.0 hrs.

Electives

MDMK 30130. Marketing Analytics 3.0 hrs.
MDMK 30440. Managing Digital Engagement 3.0 hrs.
MDMK 30460. Social Media Strategy 3.0 hrs.
MDMK 30470. Digital Marketing 3.0 hrs.
MDMK 40150. Pricing Analytics 3.0 hrs.
MDMK 40450. Customer Valuation Management t 3.0 hrs.
MDMK 40470. Applied Digital Marketing 3.0 hrs.

Double Major Opportunities within Mendoza. In addition to opportunities outside Mendoza, interested students may pursue a double major combining Marketing with Accountancy, Finance, or Strategic Management. Students pursuing any of these double majors would complete all of the requirements of both majors and may be required to take specific broadening courses. For more information, see the Department of Marketing and the Mendoza Office of Undergraduate Studies.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Marketing*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Interdisciplinary Programs and Minors

Assistant Dean for Undergraduate Studies:
Andrew Wendelborn, Mendoza College of Business

Many courses in the college are designed to cross departmental lines and provide basic tools during the sophomore and junior years or to foster the integration of various disciplines during the junior and senior years. These courses are open to all business students with appropriate prerequisites.

BUSINESS HONORS PROGRAM

The Business Honors Program is a rigorous, three-year, specialized course of study and programming within the Mendoza College of Business. With an emphasis on the importance of serious study, scholarly research, and the integral development of the human person, the program prepares students to assume demanding and complex leadership roles in business or to pursue a doctoral degree in distinguished national business programs.

Business Honors Program
This program takes a deeper look at the moral purpose of business and how it can contribute to human flourishing. A competitive admission process is open to all Notre Dame first-year students pre-admitted to Mendoza during the spring semester as well as to those students accepted for transfer into Mendoza. To qualify, students must demonstrate an interest in advancing business as a force for contributing to human flourishing, as well as a high level of academic achievement and intellectual curiosity. Expected enrollment is 60–70 students per cohort.

Students will participate in the Business Honors Program during their final three years in the College and complete six honors courses total:

- Two honors sections of courses on the Catholic social teaching on business: "Why Business?" and "God and Business?".
- Four upper-level business honors courses, one of which must be a capstone and two of which must be in major.

Students also will participate in three one-credit-hour honors colloquia that will engage them in important conversations with business executives and researchers from across campus.

UNDERGRADUATE BUSINESS RESEARCH PROGRAM

Launched in Fall 2024, the Undergraduate Business Research Program (UBRP) is designed to be interdisciplinary across Mendoza College of Business disciplines to broaden a student's perspective and potential interests that inform business research. As a UBRP scholar, students will engage in lively and constructive research discussions with one another as they learn about the research process and engage in their own research. For those interested in pursuing an academic career, the program can serve as a pathway to explore a graduate school-like experience, preparing students to be competitive in top doctoral programs.

A 1.5-credit course, BAUG 20300 Introduction to Research Scholarship, serves as the gateway course to the program. For more information, contact the minor's advisor.

MINOR IN BUSINESS AND THE COMMON GOOD

What do the aims and methods of business contribute to a life that is personally fulfilling and that also serves the common good? Are there political and economic structures that can help order business to the common good? Mendoza students with a Minor in Business and the Common Good engage with philosophical and theological perspectives to address such questions and the moral purpose of business. The following are required for completion of the minor:

BES 30310. Business and the Common Good	3.0 hrs.
BES 30795. Why Business?	3.0 hrs.
BES 20702. God and Business?	3.0 hrs.
Two Colloquia	3.0 hrs.
One Elective	3.0 hrs.

MINOR IN FOUNDATIONS OF BUSINESS

The Minor in Foundations of Business offers comprehensive exposure to the key foundational principles across all business disciplines, including finance, accounting, marketing, strategy, leadership, and business ethics.

The minor is available for a limited number of students in the College of Arts and Letters, College of Science, and Keough School of Global Affairs. A student must take at least 15 credit hours from among the following to complete the minor:

BASC 20100. Foundations of Accountancy	3.0 hrs.
BASC 20150. Foundations of Finance	3.0 hrs.
BASC 20250. Foundations of Marketing	3.0 hrs.
BES 30795. Why Business?	3.0 hrs.
MGTO 20000. Foundations of Leadership	1.5 hrs.
MGTO 20300. Foundations of Strategy	1.5 hrs.
MGTO 20700. Foundations of Ethical Behavior	1.5 hrs.

MINOR IN REAL ESTATE

Students interested in real estate may consider pursuing the Minor in Real Estate that is offered through a partnership between the Finance Department and Notre Dame's Fitzgerald Institute for Real Estate. This interdisciplinary minor, which is open to all university undergraduates, provides an opportunity to study real estate using tools from multiple disciplines, including business, finance, architecture, engineering, and the social sciences. The program's 15 required credit hours consist of the introductory course, Real Estate Fundamentals (FIN 30700), 9 credit hours in real estate electives offered across multiple colleges, and two 1.5-credit colloquia that will expose students to academic and industry perspectives on a range of topics, from real estate finance and private equity to real estate development and construction. Applications for the minor open each fall and spring. For more information please visit realestate.nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Business Administration - Business Law***
- ***Business Administration - AL***
- ***Business Administration - EG***
- ***Business Administration - SC***
- ***Business Administration - UG***

Course descriptions can be found by clicking on the subject code and course number in the search results.

Officers of Administration

In the Mendoza College of Business

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Martin J. Gillen Dean of the Mendoza College of Business

KENNETH KELLEY III, Ph.D.
Senior Associate Dean for Faculty and Research

NICHOLAS BERENTE, Ph.D.
Senior Associate Dean for Academic Programs

KRISTEN COLLETT-SCHMITT, Ph.D.
Associate Dean for Undergraduate Studies and Specialized Masters

ANDREW WENDELBORN, MNA
Assistant Dean for Undergraduate Studies

AMANDA McKENDREE, Ph.D.
Academic Director for Undergraduate Studies

BRAD BADERTSCHER, Ph.D.
Deloitte Foundation Chair of the Department of Accountancy

SHANE CORWIN, Ph.D.
William and Cassie Daley Chair of the Department of Finance

ROBERT E. EASLEY, Ph.D.
John W. Berry Chair of the Department of Information Technology, Analytics, and Operations

ANN TENBRUNSEL, Ph.D.
Rev. Basil Moreau C.S.C. Chair of the Department of Management and Organizations

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Los Altos Hills, California

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Houston, Texas

SABRINA A. ZAFFIRO
New York, New York

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College of Engineering

The College of Engineering was established as a distinct unit of the University in 1897, although a program in civil engineering was offered in 1873. The college comprises five departments: aerospace and mechanical engineering, chemical and biomolecular engineering, civil and environmental engineering and earth sciences, computer science and engineering, and electrical engineering.

Since its inception, the College of Engineering has regarded the primary purpose of all higher education as the development of the intellect, discriminatory power, and judgment in all students to enable them to arrive at sound decisions in their personal lives and in the professional lives they will pursue after graduation. The programs of studies offered in the various departments of the college are, therefore, constructed to give the student a good knowledge of the basic sciences and engineering principles, and to prepare the student for the manifold duties of an educated professional and for the cultural life of an educated person. Classroom instruction is amplified by laboratory work and design experiences that give the student insight into the application of principles to practical problems. Detailed information about the College of Engineering and its many programs can be found at engineering.nd.edu.

Engineering at Notre Dame combines technical inquiry with a creative bent (novel methods of using and producing materials, components, devices, and systems) to develop innovations that can improve the health, well-being, and quality of life for all persons. Consistent with the University's Catholic mission and heritage, the College of Engineering's mission is founded on the principle that the creation and transfer of knowledge should reflect a profound and complete respect for the dignity of all persons and for the greater common good of humanity. To appropriate the words of the University's founder, Rev. Edward A. Sorin, C.S.C., the college must be, first and foremost, a force for good in the world.

To that end, the college will continue to engage in transformational research in its core competencies—energy, biomedical/bioengineering, environmental science/engineering, and national/personal security—as they address the important needs of humanity, while inspiring students of all levels to scholarship and service. It will also continue to develop its expertise in electronic materials and devices, wireless and information systems, natural hazard mitigation, flow physics and control, geochemistry and geosciences, hydrology, and computational science and engineering, translating research outcomes into commercial ventures as possible, so that the efforts of Notre Dame engineering researchers produce the greatest good for society.

Accreditation and Academic Association. The College of Engineering is a member of the American Society for Engineering Education. Notre Dame's engineering programs are accredited as stated on each program's website. Please refer to https://engineering.nd.edu/ for additional details on accreditation.

Licensure of Engineers. Obtaining engineering licensure requires a degree from an ABET accredited degree program, passing certification examinations, and experience in the appropriate field. It is not necessary to obtain licensure immediately, but several engineering fields of work will ultimately. Recent graduates benefit by applying early for the required state examination. More information on licensure can be found at https://ncees.org/licensure-engineering/.

Programs and Degrees

The College of Engineering offers curricula leading to the undergraduate degrees listed below:

B.S. in aerospace engineering
B.S. in chemical engineering
B.S. in civil engineering
B.S. in computer engineering
B.S. in computer science
B.S. in electrical engineering
B.S. in environmental earth sciences
B.S. in environmental engineering
B.S. in mechanical engineering

To complete all degree requirements, the student must take and pass all of the courses specified in the *Bulletin* for the given degree and must earn the total minimum number of course credit hours specified for the degree.

To obtain two undergraduate degrees from the College of Engineering, a student must successfully carry out an approved program of courses totaling no less than 157 credit hours, depending on the programs. These must include all of the technical courses specified in the *Bulletin* for each degree. Students who want to pursue two engineering degree programs should contact the Dean's office in order to understand all the requirements associated with earning both degrees.

The college offers advanced degrees in the following areas:

M.S. in aerospace engineering
M.S. in bioengineering
M.S. in chemical engineering
M.S. in civil engineering
M.S. in computer science and engineering
M.S. in electrical engineering
M.S. in environmental engineering
M.S. in earth sciences
M.S. in mechanical engineering
Ph.D. in aerospace and mechanical engineering
Ph.D. in bioengineering
Ph.D. in chemical engineering
Ph.D. in civil engineering and geological sciences
Ph.D. in computer science and engineering
Ph.D. in electrical engineering

The Department of Civil and Environmental Engineering and Earth Sciences also offer a Masters in Engineering professional degree (M.Eng.). The details of this program can be found in the Graduate School *Bulletin of Information*.

Engineering Common Core. The common core consists of a set of the courses required to be completed by every engineering student. It is composed of the University Core, Basic Science Core, and Basic Engineering Core. Each are described in the sections below:

University Core Curriculum. Students enrolled in the College of Engineering must satisfy all University Core Curriculum requirements as detailed below:

Six courses in the liberal arts

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

Four courses exploring explicitly Catholic dimensions of the liberal arts

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

Two courses in writing

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

The undergraduate Core graduation standards are explained in the University Requirements section of this *Bulletin.* A Notre Dame course taken to satisfy a Common Core requirement can also be used to satisfy a Basic Science or Basic Engineering core requirement.

Basic Science Core: 27 credit hours. MATH 10550 Calculus I; MATH 10560 Calculus II; and two additional math courses totaling 7 credits (nominally MATH 20550 Calculus III, MATH 20580

Introduction to Linear Algebra and Differential Equations); CHEM 10171 General Chemistry: Fundamental Principles; PHYS 10310 General Physics I; and four more credits of general science courses as directed by the department (nominally PHYS 10320 General Physics II).

Basic Engineering Core: 6 credit hours. EG 10117 Engineering Design (3 cr.) and EG 10118 Engineering Computing (3 cr).

First Year of Studies. A first-year student intending to pursue any of the College of Engineering degree programs should, as a minimum, complete the following courses by the end of the first year:

First Semester	
WR 13100. Writing and Rhetoric	3
MATH 10550. Calculus I	4
CHEM 10171. General Chemistry: Fundamental Principles+	4
EG 10117. Engineering Design	3
Moreau First-Year Seminar	1
	15
Second Semester	
University Seminar**	3
MATH 10560. Calculus II	4
PHYS 10310. General Physics I	4
EG 10118. Engineering Computing	3
First Year Technical Elective	3
	17

+ Computer Science students may be able to delay taking CHEM 10171 until a later semester. Students should consult their advisor for more information.

*** The University Seminar may be selected from an appropriate history, social science, fine arts, advanced languages and cultures, literature, first theology, or first philosophy course. Any course coded as satisfying the University Seminar requirement will normally satisfy the university's writing requirement as well.*

General Requirements. The University of Notre Dame reserves the right to change at any time regulations included in its *Bulletins* with respect to admission to the University, continuance therein and graduation therefrom. Every effort is made to give advance information of such changes.

The College of Engineering requires students to carry a minimum of 12 and no more than 19 credit hours. In accordance with guidelines established by the Undergraduate Academic Code, students may apply for exceptions to these limits through requests submitted to the Associate Dean for Undergraduate Programs. Normally a cumulative and recent-term grade point average of 3.2 or higher is required to obtain permission to exceed 19 credit hours for a semester. Interested students should contact the Associate Dean for Undergraduate Programs for specific information.

Course Multi-Counting Policy. Completion of the engineering degree can require up to 128 credit hours of coursework. The College realizes that students may want to pursue other fields of study to complement their engineering degree. To afford these students the academic flexibility to do so, the College has adopted a multi-counting policy between a student's engineering field of study and a secondary academic credential (e.g. second major, supplemental major, minor, etc.). The multi-counting policy is:

1. To earn a specific academic credential (e.g. degree, major, minor, etc.), students must complete requirements defined in the University Core, the College and Major program, and any associated secondary academic credentials.
2. All students must earn the minimum number of unique credit hours required by their engineering degree program (see later sections in this bulletin for more information on the required credits for each engineering program).
3. Students can use one course to satisfy a University requirement, a College or Major requirement, and secondary academic credential requirement.
4. There is no limit to the number of courses that can be used for multi-counting, however a multi-counted course can only be used once in any single category (University, College/Major, and Secondary Academic credential).
5. If a student is pursuing two secondary credentials that require the same course, the course may be "cross counted" (i.e. use one course to satisfy two requirements) but must be replaced by another course in one of the programs ("Waive and Replace"). Students must obtain approval for "Waive and Replace" from the Associate Dean for Undergraduate Programs.
6. University Seminars and writing-intensive courses are designed to satisfy both a writing and University requirement or requirement of a major program of study. University Seminar, by definition, fulfills a University requirement and is not considered a double count under this rule. Writing Intensive courses may fulfill the University writing requirement and also another element of the University or College Program core.

This policy applies to academic programs contained within the college of engineering. If a student is pursuing a secondary credential outside the college of engineering (e.g. minor in Theology or supplementary major in ACMS) courses will satisfy secondary program requirements per the policies of the home college or as agreed to by the two colleges. Students should contact the Associate Dean for Undergraduate Programs with any questions on this policy.

Grand Challenge Scholars Program. The Grand Challenge Scholars Program allows engineering students to engage in transformational passionate learning and research activities that address the important needs of humanity, to inspire students to the highest levels of scholarship and service, and to enrich our students with Notre Dame's ideals and virtues. Student participation is voluntary, with an application process and open to anyone in good academic standing. Most students will begin in their sophomore year to complete the five program components in about two years. The five program competencies include: (1) Project or Research Experience, (2) Interdisciplinary Curriculum, (3) Business/Entrepreneurship, (4) Multicultural/Global Dimension, and (5) Social Consciousness/Community Engagement. Students will define their own path to meet these program components, but the College of Engineering aims to support student aspirations wherever possible. To that end, there is intentional flexibility in the requirements. More information can be found at https://engineering.nd.edu/departments-programs/grand-challenge-scholars-program/.

International Study Opportunities. There are several semester- or year-long opportunities during the academic year for juniors to study abroad. Please consult the Notre Dame Global website (study-abroad.nd.edu) for specific details on programs and requirements. Course offerings at each location may change from year to year and not all locations are appropriate for every major in the college. Students should contact their advisor or DUS to discuss what specific semester or year long study options are available for their chosen course of study.

The college currently offers summer programs for all engineering undergraduates who have completed the first year engineering curriculum. Current locations for study include London, England; Alcoy, Spain; Dublin, Ireland; Berlin, Germany; and Rome, Italy. Admission to all programs is competitive and requires demonstration of strong academic performance.

The Moreau Program
Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

Engineering Business Practice. The college recognizes the importance of providing its graduates with opportunities to learn how engineers function in the world of business and offers a multi-course sequence (EG 40421/40422) that provides education in this area. Students in all majors of the college may take at least the first course to satisfy technical elective requirements. The courses increase the effectiveness of engineering graduates by developing an understanding of the dynamics of business operations. They include issues related to ethics, leadership, and business practices such as marketing, management, finance, and human resources, and they examine the professional and leadership characteristics of modern industrial leaders. In the second course, students develop a business plan and execute it using a computer simulation program.

Combination Five-Year Programs with the College of Arts and Letters. The college recognizes the benefits of a broad background in cultural, social, and technical subjects and, in 1952, in cooperation with the College of Arts and Letters of the University, instituted a five-year program that combines the

liberal arts program with the requirements of the various engineering programs. Students who complete this combination program will earn two degrees: the degree of bachelor of arts and the degree of bachelor of science in the engineering major pursued. Dual-degree students are eligible to join the Reilly Program in Engineering and Arts and Letters described at http://reilly.nd.edu/reilly-dual-degree-in-arts-and-letters-and-engineering/.

Students pursuing this program must have strong scholastic ability and be acceptable to both the dean of the College of Arts and Letters and the dean of the College of Engineering. Application to the program is normally done by the end of the second year, but choice of a particular field in Arts and Letters may be deferred until the end of the third year.

The general sequence of courses in the five-year engineering-liberal arts program is found under "Dual Degree Programs" later in this section of the *Bulletin.*

Combination Five-Year Dual-Degree with the College of Science. The college also recognizes that a background in the natural sciences or mathematics, which are also foundational to a strong liberal arts experience, can provide engineering students with a broader context for solving societal problems and meeting humanity's needs. Thus, in 2013, the colleges of engineering and science approved a plan of study that would allow students to earn a bachelor's degree in each college in five years.

The general requirements for this program are found under "Dual Degree Programs" later in this section of the *Bulletin.*

Combination Five-Year Program with the Mendoza College of Business. To address the needs of engineering students who wish to integrate management and engineering, the College of Engineering and the Mendoza College of Business have established a program in which a student may earn the bachelor of science degree from the College of Engineering and the master of business administration from the Mendoza College of Business (there is no program where a student can earn dual undergraduate degrees from the College of EG and Mendoza College of Business).

The program is structured so that a student who has completed the first three years of the bachelor's degree program, if accepted through a competitive admissions process, completes the master of business administration and the bachelor of science in engineering by the end of the fifth year. This program may require summer or intersession work.

Students who wish to pursue this program should have a superior scholastic record in their undergraduate program and must apply to and be accepted by the MBA program during their third year in the College of Engineering.

The general sequence of courses in the five-year engineering-MBA program may be found under "Dual Degree Programs" later in this section of the *Bulletin.*

Combination Five-Year Program with Saint Mary's College. Students at Saint Mary's College may elect to earn a B.S. in biology, chemistry, or mathematics from Saint Mary's while simultaneously earning a B.S. in a related engineering program at Notre Dame. This program requires five years of study. When approved for this program, students at Saint Mary's College, Notre Dame, Ind., may take a combination program of science classes at Saint Mary's and engineering classes at Notre Dame beginning in their sophomore year at Saint Mary's. The student will earn her bachelor of science degree from Saint Mary's at the end of the fourth year, and complete her bachelor of science in engineering degree in her fifth year at Notre Dame. Students interested in this program must consult the appropriate advisor(s) at Saint Mary's College before enrolling in required courses at Notre Dame.

Combination Five-Year Programs with Other Schools. The highly desirable objective to infuse more liberal arts and sciences work into the education of engineering students has also been met also through 3-2 engineering programs with select liberal arts institutions.

The University of Notre Dame has entered into agreements with Assumption College, Worcester, Mass.; Bethel University, Mishawaka, Ind.; Carroll College, Helena, Mont.; Elon University, Elon, N.C.; Franciscan University, Steubenville, Ohio; Goshen College, Goshen, Ind.; Kings College, Wilkes-Barre, Penn.; Loyola University Chicago, Chicago, Ill.; Saint Anselm College, Manchester, N.H.; Stonehill College, Easton, Mass.; University of St. Thomas, St. Paul, Minn.; University of St. Thomas, Houston, Tex.; Xavier University of Louisiana, New Orleans, La., and the Atlanta University Center, comprising Morehouse College, Spelman College and Clark Atlanta University in Atlanta, Ga., whereby the liberal arts and sciences part of a combination five-year program is given by these respective colleges and the engineering part by Notre Dame. In these dual-degree programs, the student spends three years at a college of first choice and two years at Notre Dame. After completion of the five-year program, the student receives a bachelor of arts or bachelor of science degree from the first college and a bachelor of science in engineering degree from Notre Dame.

The sequence of courses for any of these programs will vary depending on the program of study at the other institution. No attempt has been made to set up a rigid pattern, and each participating institution has some freedom concerning the choice and arrangement of courses, provided that the coverage in the areas of mathematics, physics, chemistry, computing, introductory engineering, theology, philosophy, history, social science, and literature or fine arts is appropriate. It is expected, however, that students will complete the equivalent of the first two years of the desired College of Engineering program before applying for transfer.

To be eligible for an undergraduate degree, the student must complete a minimum of 62 credit hours at the University with a minimum of 75% of the degree credit hours (not less than 90 credit hours) earned after high school graduation through college and university courses, and be enrolled in the last semester on the main university campus. Please consult the Undergraduate Academic Code for further details.

Details of these programs may be obtained by writing to the institutions concerned or to the College of Engineering.

Graduate Programs in Engineering.* The Graduate School of the University of Notre Dame comprises four divisions: humanities, social science, science, and engineering. The division of engineering was organized in 1946 with power to grant advanced degrees in the departments of aerospace and mechanical engineering, chemical and biomolecular engineering, civil and environmental engineering and earth sciences, computer science and engineering, and electrical engineering. The general conduct of graduate work is under the jurisdiction of the Graduate Council of the University, the members of which serve as specified in the Academic Articles. Director of the program in the engineering division is the dean of the College of Engineering.

** Reference should be made to the* Graduate School Bulletin of Information *for details of these programs and to the Web at http://graduateschool.nd.edu/departments-and-programs/degree-programs-by-division/.*

MINORS

The College of Engineering and its five departments offer several minors and concentrations which allow students to develop breadth (minors) or depth (concentrations) in areas that are of interest to them. Students can find the latest up-to-date listing of minors and concentrations on the college and departmental websites—https://engineering.nd.edu.

College Awards and Prizes

COLLEGE OF ENGINEERING AWARDS

The Rev. Thomas A. Steiner Prize. From a fund established in 1948 by former students of Rev. Thomas A. Steiner, C.S.C., former dean of the College of Engineering, a cash award is made to seniors in the college who have been selected for their all-around excellence as students.

The Reilly Scholar Designation. The designation of Reilly Scholar is given annually to those fifth-year seniors enrolled in the dual Engineering/Arts and Letters program who have excelled academically and otherwise during their first four years as students.

The Americo Darin Prize. This prize recognizes several engineering students who have demonstrated the most improvement in academic performance over their first four semesters at Notre Dame. The prize was made possible by the Darin Family who established it in memory of their father, Americo Darin.

Edward and June Prein Family Award for Student Excellence in Engineering. The Prein Family award is a cash award that recognizes high-performing students in the College of Engineering who are active in service and leadership at the College and University levels.

Departmental Awards

AEROSPACE AND MECHANICAL ENGINEERING

Patrick J. Deviny Award. Presented each year to a junior aerospace student who has displayed the most diligence and persistence in the pursuit of undergraduate studies in aerospace engineering.

Vincent P. Goddard Design Award. Presented each year to a senior in aerospace engineering for outstanding performance in the aerospace design course.

Sigma Gamma Tau Honor Award. Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

Pi Tau Sigma Honor Award. Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

The Aero Propulsion Award. Presented each year to a senior in aerospace engineering for outstanding performance in the Gas Turbine and Propulsion class.

The Zahm Prize for Aeronautical Engineering was founded in 1946 by Dr. Albert J. Zahm, distinguished pioneer in aeronautics and at one time professor of physics at the University of Notre Dame. The award is made to the senior aerospace engineering student who, in the estimation of the faculty of the program, has achieved the most distinguished record in professional subjects.

The Zahm Prize for Mechanical Engineering. Beginning with 2007–08 year, awarded to a senior mechanical major who, in estimations of the faculty, has achieved the most distinguished record in professional subject.

Jerome L. Novotny Design Award. Presented each year to a junior in mechanical engineering for the best design in the junior heat transfer course.

The Rockwell Automation Power Systems Design Award. Presented each year to seniors in mechanical engineering for the best design in the senior mechanical engineering design course.

Best Undergraduate Research Paper. Presented each semester to the undergraduate who has written the best research paper based on research done during undergraduate research class for the semester.

CHEMICAL AND BIOMOLECULAR ENGINEERING

American Institute of Chemists Award. Presented to an outstanding senior in the Department of Chemical and Biomolecular Engineering.

Chemical Engineering Alumni Award. Presented to one or more seniors who have an outstanding combination of scholarship and extracurricular activities.

Chemical Engineering Faculty Award. Presented to the senior with the highest scholastic average after seven semesters of study.

Chemical Engineering Research Award. Presented to one or more undergraduate students who have performed outstanding undergraduate research.

James P. Kohn Scholarship in Chemical Engineering. A fund dedicated to helping meet the financial need of top performing seniors.

John C. Treacy Award. Presented to the student with the highest score in thermodynamics.

CIVIL AND ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

The American Society of Civil Engineers Activity Award. The Indiana section each year presents an award to the two senior students most active in the student chapter of ASCE.

Leroy D. Graves Academic Improvement Award. Presented to a senior civil engineering student for significant development in academic performance.

The Sydney Kelsey Outstanding Scholar Award. Presented to a senior civil engineering student for excellence and creativity in academics.

The Kenneth R. Lauer Award. Presented to a senior civil engineering student for leadership, integrity, and service to fellow students and community as determined by that student's classmates.

James A. McCarthy Scholarship in Civil Engineering. Presented to a junior civil engineering student for outstanding academic and professional excellence.

The Walter L. Shilts Award for Undergraduate Achievement. Presented to a senior civil engineering student who has best fulfilled his or her potential as a student through hard work and dedication to obtaining the best possible education.

The Rev. Alexander Kirsch, C.S.C., Award. To the senior receiving a degree in geological sciences who has evidenced high qualities of personal character, scholarship, and leadership.

Dr. Raymond C. Gutschick Award. To the graduating senior who has demonstrated the most promise in geological research as evidenced by a successful research project.

COMPUTER SCIENCE AND ENGINEERING

Outstanding Computer Engineering Award. To the graduating senior in computer engineering who has evidenced high qualities of personal character, scholarship, and leadership.

Outstanding Computer Science Award. To the graduating senior in computer science who has evidenced high qualities of personal character, scholarship, and leadership.

ELECTRICAL ENGINEERING

The James L. Massey Award. For achievement in electrical engineering, recalling communication theory, undergraduate teaching, and the Binary Examination.

The Basil R. Myers Award. For achievement in electrical engineering, recalling circuit theory, the English language, and St. George Day at Notre Dame.

The Arthur J. Quigley Award. For achievement in electrical engineering, recalling electronics, service to our neighbor, and the little man in the circuit.

The Laurence F. Stauder Award. For achievement in electrical engineering, recalling electrical power, the IEEE Student Branch, and the Notre Dame alumni.

The IEC William L. Everitt Award. For achievement in electrical engineering, computer engineering, or computer science, with an interest in the area of communications.

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Student Organizations and Activities

HONOR SOCIETIES

TAU BETA PI
In 1960, the Indiana Gamma Chapter of Tau Beta Pi was installed at Notre Dame to foster a spirit of liberal culture in the engineering college and to recognize those who have conferred honor upon Notre Dame by distinguished scholarship and exemplary character as undergraduates in engineering or by their attainment as alumni in the field of engineering. Seniors in the top fifth of their class and juniors in the top eighth of ther class are eligible for election under rigid standards of scholarship, character, leadership, and service.

ETA KAPPA NU
In 1962, the Delta Sigma Chapter of Eta Kappa Nu, the national honor society for electrical engineers, was installed at Notre Dame. Juniors, seniors, and alumni are elected to membership on the basis of scholastic attainment, leadership, and quality of character.

PI TAU SIGMA
In 1963, the Sigma Beta Chapter of Pi Tau Sigma, the national honor society for mechanical engineers, was installed at Notre Dame. Juniors, seniors, and alumni are elected to membership on the basis of scholastic attainment, leadership, quality of character, and a demonstration of probable future success in engineering.

CHI EPSILON
In 1966, the Notre Dame Chapter of Chi Epsilon, the national honor society for civil engineers, was installed at Notre Dame. Chi Epsilon recognizes those civil engineering students, faculty, and alumni who have displayed superior qualities in scholarship, character, practicality, and sociability during their professional careers.

SIGMA GAMMA TAU
In 1981, the Notre Dame Chapter of Sigma Gamma Tau, the national honor society for aerospace engineers was installed. This organization recognizes and honors those individuals in the field of aeronautics and astronautics who have distinguished themselves through scholarship, integrity, service, and outstanding achievement. Senior students who rank in the top third of their aerospace engineering class are eligible for admission.

UPSILON PI EPSILON
In 2004, the Notre Dame chapter of Upsilon Pi Epsilon, which recognizes the academic excellence of students in the computing and information disciplines, was installed at Notre Dame. Outstanding juniors, seniors, and graduate students from the Department of Computer Science and Engineering are honored each year with induction.

PROFESSIONAL SOCIETIES

Several departments of the college actively support student chapters of their respective professional societies; these are:

American Institute of Aeronautics and Astronautics (AIAA)
American Institute of Chemical Engineers (AIChE)
American Society of Civil Engineers (ASCE)
American Society of Mechanical Engineers (ASME)
Association of Computer Machinery (ACM)
Institute of Electrical and Electronic Engineers (IEEE)
National Society of Black Engineers (NSBE)
Society of Asian Scientists and Engineers (SASE)
Society of Hispanic Professional Engineers (SPHE)
Society of Women Engineers (SWE)

The Engineering Leadership Council (ELC), a student organization with representation from the college's professional and honor societies, coordinates the activities of all engineering organizations and encourages the pursuit of a professional attitude in the student body of the College of Engineering. The ELC sponsors activities of general interest to the engineering student body.

Aerospace and Mechanical Engineering

Chair:
Glen I. Niebur
Associate Chair:
Tengfei Luo
H. Clifford and Evelyn A. Brosey Professor of Mechanical Engineering:
Frank P. Incropera (emeritus)
Roth-Gibson Professor of Engineering:
Eric J. Jumper
Viola D. Hank Professors of Mechanical Engineering:
David B. Go; Nicholas Zabaras
Clark Professor:
Thomas C. Corke
Dorini Family Professor for Energy Studies:
Tengfei Luo
Roth-Gibson Professor of Bioengineering:
Pinar Zorlutuna
Dunn Family Teaching Professor:
Michael J. Seelinger
Professors:
Hafiz M. Atassi (emeritus); J. William Goodwine Jr.; Edward Kinzel; Robert Landers; Karel Matous; Ryan G. McClarren; Scott C. Morris; Svetlana Neretina; Glen L. Niebur; Timothy C. Ovaert; Samuel Paolucci (emeritus); Joseph M. Powers; Ryan K. Roeder; Steven R. Schmid (emeritus); James P. Schmiedeler; Mihir Sen (emeritus); Flint O. Thomas (emeritus); Meng Wang; Yanliang Zhang
Associate Professors:
Stanislav Gordeyer; Hanjaya Putra; Maria Holland; Thomas Juliano; Hirotaka Sakaue; Patrick Wensing; Matthew Zahr
Assistant Professors:
Edgar Bolivar-Nieto; Huibin Chang; Margaret Coad; Meenal Datta; Dasha Gloutak; Emily Johnson; Jingcheng Ma; Jonathan MacArt; Madeline Peck; Mark Plecnik; Matthew Rosenberger; Adrienne Scott
Teaching Professor:
Craig Goehler
Associate Teaching Professors:
John Ott (emeritus); Paul F. Rumbach; Jing Wang
Assistant Teaching Professor:
Megan Prygoski; Maria Warren

Program of Studies. The Department of Aerospace and Mechanical Engineering offers programs of study that lead to degrees of bachelor of science and master of science in aerospace engineering and mechanical engineering, respectively; and doctor of philosophy.

The Program in Aerospace Engineering. The aerospace program is designed to prepare those students interested in the design and operation of aircraft and space vehicles for entrance into a professional career. The curriculum, based on a sound foundation in mathematics, physics, chemistry and the engineering

sciences, places emphasis on such basic aerospace disciplines as aerodynamics and fluid mechanics, orbital mechanics, and solid and structural mechanics, as well as such integrating disciplines as design, experimental methods and systems analysis. By choosing suitable elective courses students may earn a concentration in the following areas:

- Bioengineering
- Computational Engineering
- Control and Mechanical Systems
- Design and Manufacturing
- Energy
- Materials
- Thermal and Fluid Sciences

By fulfilling the requirements, students may earn any University minor. The department administers the following engineering minors:

- Bioengineering
- Computational Engineering
- Energy Engineering

The aerospace engineering program uses laboratories in Fitzpatrick Hall of Engineering and in the Hessert Laboratory for Aerospace Research. The Hessert laboratories contain superior facilities for instruction and research.

Students are encouraged to participate in the activities of the student chapter of the American Institute of Aeronautics and Astronautics and to enter the national student paper competition conducted by the parent institute and other aerospace extracurriculars such as ND Rocketry; Design, Build, Fly; and IsishSAT. Outstanding achievement in the aerospace program is recognized by membership in Sigma Gamma Tau, the national aerospace honor society.

Further details about the standard aerospace program, the Rome Program and electives can be found on the department website at ame.nd.edu.

First Year of Studies
First-year students intending to major in aerospace engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following curriculum is applicable to students entering the University in the Fall semester of 2025.

For the Aerospace Engineering Program
To earn a Bachelor of Science degree in Aerospace Engineering, students entering the university in the Fall of 2025 must complete the following courses.

1. *University Core Curriculum Requirements (26 credits).* Note the Liberal Arts 1, 2 and 3 requirements will be covered by the College of Engineering Requirements and the Aerospace Engineering Requirements.
2. *College of Engineering Requirements (33 credits)*
3. *Aerospace Engineering Core Requirements*
   a. *Design and Experimental (20 credits)*
      - AME 20210. Introduction to Design Thinking in Engineering
      - AME 20216. Lab I
      - AME 20217. Lab II
      - AME 21267. Design Tools I
      - AME 21268. Design Tools II
      - AME 30251. Computing, Numerical Methods and Data Science in Engineering
      - AME 40461. Aerospace Design I
      - AME 40462. Aerospace Design II

   b. *AE Foundational (15 credits)*
      - AME 20221. Mechanics I
      - AME 20222. Mechanics II
      - AME 20241. Solid Mechanics
      - AME 30341. Aerospace Structures
      - AME 30342. Design and Analysis of Space Structures

   c. *Aerodynamics and Fluid/Thermal Sciences (18 credits)*
      - AME 20231. Thermodynamics
      - AME 30331. Fluid Mechanics
      - AME 30332. Compressible Aerodynamics
      - AME 30333. Theoretical and Experimental Aerodynamics
      - AME 30334. Heat Transfer
      - AME 40431. Gas Turbines and Propulsion

   d. *Dynamics and Control (12 credits)*
      - AME 30314. Differential Equations, Vibrations and Control I
      - AME 30315. Differential Equations, Vibrations and Control II
      - AME 30381. Orbital and Space Dynamics
      - AME 40451. Aerospace Dynamics

   e *Electives (3 credits)*
      - One Professional Development Elective

Total for the four years: 127 credits.

A list of approved professional development courses is available in the AME Undergraduate Handbook on the department website.

See "University Core Curriculum" on the first page of the College of Engineering section.

The most current information for the degree program course requirements is available in the AME Undergraduate Handbook on the department website, ame.nd.edu.

The Program in Mechanical Engineering. The department offers a well-rounded program at the bachelor's level. The curriculum is built on a sound foundation in mathematics, physics, chemistry and the engineering sciences. In the undergraduate curriculum the student may obtain, by suitable selection of elective courses, a program suited to enable him or her to specialize in a given sequence or to prepare as a generalist. Students may earn a concentration in the following areas by selective suitable electives:

- Aerospace
- Bioengineering
- Computational Engineering
- Control and Mechanical Systems
- Design and Manufacturing
- Energy
- Materials
- Thermal and Fluid Sciences
- da Vinci

By fulfilling the requirements, students may earn any University minor. The department administers the following engineering minors:

- Bioengineering
- Computational Engineering
- Energy Engineering

Finally, for professional growth during formative years as engineers in training, students are encouraged to participate in the activities of the student chapter of the American Society of Mechanical Engineers and other mechanical engineering extracurriculars such as SAE, Baja, Fighting Irish Racing, and Robot Football. Outstanding achievement in the mechanical engineering program is recognized by membership in Pi Tau Sigma, the national mechanical engineering honor society.

Further details about the mechanical engineering program, the London and Rome Programs and electives can be found on the department website at ame.nd.edu.

First Year of Studies
First-year students intending to major in mechanical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

For the Mechanical Engineering Program
To earn a Bachelor of Science degree in Mechanical Engineering, students entering the university in the Fall of 2025 must complete the following courses.

1. *University Core Curriculum Requirements (26 credits).* Note the Liberal Arts 1, 2 and 3 requirements will be covered by the College of Engineering Requirements and the Mechanical Engineering Requirements.
2. *College of Engineering Requirements (33 credits)*
3. *Mechanical Engineering Core Requirements*
   a. *Design and Experimental (22 credits)*
      - AME 20210. Introduction to Design Thinking in Engineering
      - AME 20216. Lab I
      - AME 20217. Lab II
      - AME 21267. Design Tools I
      - AME 21268. Design Tools II
      - AME 30251. Computing, Numerical Methods and Data Science in Engineering
      - EE 20222. Introduction to Electrical Engineering and Embedded Systems
      - AME 40463. Senior Design Project

   b. *Mechanics and Machine Design (15 credits)*
      - AME 20221. Mechanics I
      - AME 20241. Solid Mechanics
      - CBE 20261. Science of Engineering Materials
      - AME 30363. Design of Machine Elements
      - AME 40423. Mechanisms and Machines

   c. *Fluid/Thermal Sciences (9 credits)*
      - AME 20231. Thermodynamics
      - AME 30331. Fluid Mechanics
      - AME 30334. Heat Transfer

   d. *Dynamics and Control (9 credits)*
      - AME 20222. Mechanics II

- AME 30314. Differential Equations, Vibrations and Control I
- AME 30315. Differential Equations, Vibrations and Control II

e. *Electives (12 credits)*
- Two AME Technical Electives
- Two General Technical Electives

Total for the four years: 126 credits.

A list of approved AME and technical specialization courses is available on the department website.

See "University Core Curriculum" in the AME Undergraduate Handbook on the first page of the College of Engineering section.

The most current information for the degree program course requirements is available in the AME Undergraduate Handbook on the department website at ame.nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Aerospace and Mechanical Engineering*. Course descriptions can be found by clicking on the subject code and course number in the search results.

A number of introductory graduate-level courses, described in the *Graduate School Bulletin of Information* and on the department website, are open to advanced undergraduates to satisfy upper-level electives.

Chemical and Biomolecular Engineering

Dorini Family Professor of Energy Studies and Chair:
William F. Schneider
Anthony Earley Professor of Energy and Environment:
Eduardo Wolf (emeritus)
Arthur J. Schmitt Professor of Chemical & Biomolecular Engineering:
Paul W. Bohn
Donald and Susan Rice Professor of Engineering:
Merlin L. Bruening
Bayer Corporation Professor of Engineering:
Hsueh-Chia Chang
Bernard Keating-Crawford Professor in Chemical Engineering:
Nosang Myung
Tony and Sarah Earley Professor of Energy and the Environment:
Thomas Degnan (emeritus)
Keough-Hesburgh Professor of Engineering:
Edward J. Maginn
Frank M. Freimann Collegiate Professors of Engineering:
Rulian Guo; Jason C. Hicks
Rooney Family Collegiate Professor of Engineering:
William A. Phillip (Director of Graduate Studies)
Sheehan Family Collegiate Associate Professor of Engineering:
Jennifer L. Schaefer
Keating-Crawford Collegiate Professor of Engineering:
Matthew J. Webber
Clare Booth Luce Assistant Professor of Chemical Engineering:
Sima Asadi
Professors:
Basar Z. Bilgicer (Director of Graduate Admissions); Joan Brennecke (emeritus); Peter Kilpatrick (emeritus); David T. Leighton Jr.; Mark J. McCready; Paul J. McGinn; Albert Miller (emeritus); Mark Stadtherr (emeritus); William Strieder (emeritus)
Associate Professors:
Yamil Colón (Director of Inclusive Excellence); Alexander W. Dowling; Davide Hill (emeritus); Jonathan K. Whitmer; Jeremiah J. Zartman
Assistant Professors:
Gabriel Burks; Casey P. O'Brien; Yichun Wang
Research Professor:
Alexander Mukasyan
Associate Research Professor:
Satyajyoti Senapati
Assistant Research Professor:
Yong Zhang
Teaching Professors:
Victoria Goodrich; Troy J. Vogel (Director of Undergraduate Studies)
Associate Teaching Professors:
Jennifer Ehren; Tanyel Kiziltepe

Program of Studies. The Department of Chemical and Biomolecular Engineering offers programs of study leading to the degrees of bachelor of science in chemical engineering, and doctor of philosophy.

The traditional role for chemical engineers of providing the principal technical guidance for the chemical and petroleum industries has been greatly augmented in recent years. Chemical engineers now direct the advancement and utilization of technology for the food processing and consumer products industries and are playing increasing roles in the manufacture of the highest density computer chips and in the invention of advanced drug delivery systems. In addition to creating remediation strategies, chemical engineers contribute to the prevention of deleterious impact of society on the environment by the development of new greener process technologies such as eliminating the use of dangerous solvents or by improving process efficiencies. They are the leaders in the field of sustainability which is the implementation of energy sources and raw material supplies that can sustain humankind indefinitely. In all of these areas, complex processes involving chemical changes of matter occur and, as such, sound training in chemistry, physics, mathematics, and allied applied sciences are prerequisites to resolving the challenges seen within these complex systems.

The undergraduate program at Notre Dame is notable for its combination of a strong fundamental focus in chemical engineering courses with a broad humanities and science education provided in courses other than chemical engineering. The science and humanities courses prepare students both for the study of chemical engineering and to understand complex problems of today which need consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors. Our intention in emphasizing fundamentals is to develop students' intellect and equip them with enduring knowledge in chemical engineering and related fields. Thus, our undergraduate chemical engineering curriculum provides students with not only a preparation for a career as a chemical engineer, but for a lifetime of learning and a lifelong career in areas that may include law, medicine, or business.

University of Notre Dame Undergraduate Program Goals: Students who have graduated in Chemical Engineering at Notre Dame have successfully pursued a wide range of career paths. The faculty believe that this has resulted from the interests of students who enter our program and is facilitated by our emphasis on fundamental aspects of chemical engineering. Consistent with the mission of the University, the Department of Chemical and Biomolecular Engineering program seeks to develop students who:

1. Pursue knowledge and commensurate understanding and critically evaluate the consequences of these.

2. Communicate clearly and effectively.

3. Demonstrate proficiency in the art and science of chemical engineering with a strong understanding of the fundamental principles of pure and engineering

sciences on which chemical engineering practice is based.

4. Appreciate their social and moral responsibilities both within their careers in engineering and through service in their communities.

5. Understand how chemical engineering connects with other major disciplines to produce the goods and services needed by society.

Within the chemical engineering degree program, students can complete concentrations in materials, energy, and biomolecular engineering. A suggested course sequence for students interested in going to medical school is also available.

More than one-third of the chemical engineering undergraduates participate in research activities with faculty and graduate students at some time in their careers in areas such as advanced materials, ionic liquids, separations, biomaterials, microfluidic devices, catalysis, fuel cells, and drug delivery techniques.

Further details about the chemical engineering program may be found at cbe.nd.edu.

Program Requirements
The following degree requirements are applicable to students first matriculating Fall 2023. A suggested course sequencing is suggested on the CBE website, cbe.nd.edu. Curricular flexibility allows for many courses to be taken both fall and spring semesters. To earn the BS in Chemical Engineering, students must complete the following requirements

1. *Completion of University Core Curriculum requirements (26 credits).* Note the Liberal Arts 1, 2 and 3 requirements are covered by courses required by the College of Engineering and the Chemical Engineering Program.
2. *Completion of the College of Engineering requirements (33 credits):*
   - EG 10117. Engineering Design
   - EG 10118. Engineering Programming
   - MATH 10550. Calculus I
   - MATH 10560. Calculus II
   - ACMS 20550. Applied Math I
   - CHEM 10171/11171. Introduction to Chemical Principles
   - PHYS 10310. General Physics I
   - PHYS 10320. General Physics II
3. *Completion of the Chemical Engineering degree requirements.*
   a. *Chemical Engineering Core courses requirement (36 credits)*:
      - CBE 20255. Introduction to Chemical Engineering Analysis
      - CBE 20236. Applied Linear Algebra and Numerical Methods
      - CBE 20260. Chemical Engineering Thermodynamics I or CBE 20280 Biomolecular Thermodynamics
      - CBE 20261. Science of Eng. Materials
      - CBE 30337. Applied Statistics and Data Analysis
      - CBE 30338. Chemical Process Control
      - CBE 30355. Transport Phenomena I or CBE 30357. Biotransport
      - CBE 30356. Transport Phenomena II
      - CBE 30370. Phase Equilibria and Separations
      - CBE 31358. Chemical Engineering Laboratory I
      - CBE 40445. Chemical Reaction Engineering
      - CBE 40448. Chemical Process Design
      - CBE 41459. Chemical Engineering Laboratory II or CBE 41910. Biomolecular Engineering Lab

   b. *Other course requirements (17 credits):*
      - BIOS 10172. Biology II: Molecules to Ecosystems
      - CHEM 10176/11172. Organic Chemistry for Chemical Engineers
      - CHEM 30333/31333. Analytical Chemistry I
      - CHEM 30324. Physical Chemistry for Engineers or CHEM 40420. Biochemistry
      - ACMS 20750. Applied Math II

   c. *Chemical Engineering Elective Requirement (6 credits).* Chemical Engineering Electives are 3 credit CBE 3XXXX+ courses not specifically required for degree completion. Each semester between 5-8 electives are offered in a variety of Chemical Engineering topics. CBE 48902 cannot be used as a Chemical Engineering Elective.

   d. *General Technical Electives (9 credits).* Technical Electives (3 credits) are 2XXXX+ level courses in the College of Science or College of Engineering intended for STEM majors. Technical Elective hours can add up to the 3 required. Advanced Technical Electives (6 credits) are 3 credit 3XXXX+ level courses in the College of Science or College of Engineering intended for STEM majors. Some classes are excluded from General Technical Electives. Be sure to check with your advisor for courses that have Core Curriculum attributes other than WKST or WKQR or that are crosslisted outside of CoE or CoS. A maximum of 3 credits of approved undergraduate research may count toward the 9 General Technical Elective credits required. Once Chemical Engineering Electives have been satisfied, additional Chemical Engineering courses taken will populate the Advanced Technical Elective requirement, then the Technical Elective requirement.

   e. *Professional Enrichment (1 credit).* CBE 20290, CBE 28901, CBE 48901, CBE 28980, SCPP 40001, or other course contributing to professional enrichment by petition to the Director of Undergraduate Studies.

4. *Earn a minimum of 128 credit hours of course credit.* While the above requirements total 128 credits, if courses double count toward more than one requirement stated, students must complete a minimum of 128 credits.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Chemical & Biomolecular Engineering.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Certain graduate courses are open to advanced undergraduates with permission from the department chair or director of undergraduate studies, and the course instructor. Students interested in graduate studies are encouraged to explore this option.

Civil and Environmental Engineering and Earth Sciences

Henry J. Massman Chair:
Diogo Bolster
Associate Chair:
Kyle Bibby
Henry J. Massman Professor of Civil Engineering:
Peter C. Burns
Robert M. Moran Professor of Civil Engineering:
Ahsan Kareem
Wayne and Diane Murdy Professor of Engineering and Geosciences:
Harindra J. Fernando
Joseph and Nona Ahearn Professor in Computational Science and Engineering:
Joannes J. Westerink
Professors:
Kyle Bibby; Jeremy B. Fein; Robert L. Irvine (emeritus); Andrew Kennedy; Tracy L. Kijewski Correa; Yahya C. Kurama; Patricia A. Maurice (emeritus); Clive R. Neal; Robert Nerenberg; David Richter; James I. Taylor (emeritus); Joshua Shrout; Stephen E. Silliman (emeritus); Alexandros Taflanidis
Associate Professors:
Melissa Berke; Kyle Doudrick; Alan Hamlet; Amy Hixon; Lloyd H. Ketchum Jr. (emeritus); Kapil Khandelwal; Jerry J. Marley (emeritus); Rev. James A. Rigert, C.S.C. (emeritus); Antonio Simonetti; Ashley Thrall
Assistant Professors:
Patrick Brewick; Paola Crippa
Professor of the Practice:
Luis Fargier-Gabaldon
Teaching Professors:
Brian Smith; Brad D. Weldon
Associate Teaching Professors:
Yazen Khasawneh; Stefanie Simonetti; Kevin Walsh

Program of Studies. The Department of Civil and Environmental Engineering and Earth Sciences offers programs of study leading to the degrees of bachelor of science in civil engineering, bachelor of science in environmental engineering, bachelor of science in environmental earth sciences, master of science in civil engineering, master of engineering in structural engineering, master of engineering in environmental engineering, master of science in environmental engineering, master of science in environmental earth sciences, and doctor of philosophy.

Program Goals. The Department of Civil and Environmental Engineering and Earth Sciences (CEEES) focuses on knowledge related to civil infrastructure, natural and manmade hazards, environment, energy, water, and planet systems. We emphasize a strong foundation in science and engineering with a focus in the areas of structural engineering, environmental engineering, environmental fluid dynamics, and geochemistry. Our professions develop the fundamental and applied technologies that impact people's health, well-being, and ability to thrive through our work on infrastructure (buildings, bridges, tunnels, waterways, ports, roads, dams, offshore energy platforms, wind farms), clean water supply (water resources, water distribution and water treatment), sewage and waste disposal (wastewater treatment), protection from natural hazards (earthquakes, tornadoes, tsunamis, riverine floods, winds, waves, hurricanes), energy systems (offshore oil extraction, wind farms, hydro-electric, nuclear fuel reprocessing), safe and sustainable environments (pollutants in the atmosphere, groundwater, surface water, reactive transport of pollutants within these systems, biological and geochemical processes, the interplay of natural processes such as mineral-water-rock-bacteria interactions, and anthropogenic issues such as transport of toxic heavy metals and safe disposal of nuclear waste), and the larger geophysical and geochemical earth system. CEEES strives to provide a stimulating and unique interdisciplinary environment for learning and research by blending traditional disciplines of science and engineering. CEEES offers outstanding educational programs for those aspiring to contribute as leaders in the fields of Civil Engineering, Environmental Engineering, and Environmental Earth Sciences. CEEES educational objective is to provide students with the knowledge, skills, vision and ethical basis to contribute as leaders in design, construction and protection of our civil infrastructure, and understanding, management and remediation of the environment.

CEEES has very innovative undergraduate programs that synergize classroom teaching with research, field trips, lecture series and hands on experiences that expose students to the realities and professionals in their field. These programs are designed to be inspirational and lead to inquiry as well as lead to life-long connections in the field. All of our students experience in-depth fieldtrips and the majority of our students participate in research programs, thematic professional competitions, and professional lecture series. In addition, our students have a strong tradition of service in programs such as NDSEED, a student organization that proposes, designs, finances and builds bridges for poor communities in Central America, and Engineers Without Borders. The department has a long tradition of placing its graduates from both undergraduate and graduate programs into sectors that truly serve society from their most basic needs of clean water and shelter to the advanced energy and transportation systems that sustain a thriving economy and a high standard of living. Our alumni have a history of success and exemplary leadership in academia, consulting, national laboratories, construction, and industry.

PROGRAM IN CIVIL ENGINEERING.

The department presents a well-rounded program for the bachelor's degree with the first two years devoted primarily to the basic principles of science and engineering. The third and fourth years are devoted to courses in the basic areas of civil engineering—structural analysis and design, hydraulics and hydrology, water supply and wastewater disposal, materials of construction, geotechnical engineering, and transportation engineering. A student may emphasize a particular area of interest by selecting either the structures or hydraulics concentrations, with an option for students to add an additional concentration in construction management. Civil engineering electives in the senior year may be regular courses, individualized directed study or research courses. The civil engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design projects to facilitate the student's understanding of the design process.

The program provides a firm foundation in the many basic disciplines comprising the broad field of civil engineering. This is especially desirable, for often in the course of professional development the civil engineer is asked to coordinate the planning, design, and construction of highly complex systems and must use many or all of these disciplines.

The department has excellent facilities for research available to both graduate and undergraduate students. These facilities include a structural dynamics/structural control laboratory; a materials testing and structural research laboratory; a groundwater hydrology field laboratory; and a number of analytical laboratories for water, wastewater and hazardous waste treatment.

The professional aspects of civil engineering are emphasized and promoted by the activities of a student chapter of the American Society of Civil Engineers, in which all students of the department are eligible and encouraged to participate. In addition, a junior class field trip examines major infrastructure projects and environmental systems including tall buildings, bridges, stadiums, transportation systems, navigations systems, flood protection works, clean water supply, and wastewater systems.

Further details about the civil engineering may be found on the Web at ceees.nd.edu.

First Year of Studies
First-year students intending to major in civil engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following courses are applicable to students entering the College in 2025.

Sophomore Year

First Semester

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
CE 20150. Statics	3
CE 20111. Planet Earth	3
CE 20600. Intro to CAD	2
	15.5

Second Semester

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
ACMS 30440. Probability and Statistics	3
AME 20241. Solid Mechanics	3
CE 30160. CE Materials	4
Core Curriculum course+	3
	16.5

Junior Year

First Semester

MATH 30650. Differential Equations	3
CE 30125. Computational Methods	3
CE 30200. Intro to Struct. Engrg	3
CE 30300. Intro to Env. Engrg	3
CE 30460. Fluid Mechanics	3
	15

Second Semester

CE 40270. Reinf. Concrete Design	3
CE 40450. Hydraulics	3.5
CE 30150. Dynamics & Modeling	3
Core Curriculum course+	3
Core Curriculum course+	3
	15.5

Senior Year

First Semester

CE 40620. Transportation	3
Core Concentration Elective**	4
CE 40701. Principles of Practice	1
CE 30510. Intro to Geotech Engineering	3.5
Core Curriculum course+	3
	14.5

Second Semester

CE 40702. Senior Design	3
Core Concentration Elective**	3
CE Elective**	3
CE Elective**	3
Core Curriculum course+	3
	15
Total degree required credits	128

+See "University Core Curriculum" on the first page of the College of Engineering section.

***Note: All electives are as defined in the academic guide for the Department of Civil and Environmental Engineering and Earth Sciences on the department's website.*

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

PROGRAM IN ENVIRONMENTAL ENGINEERING

This program was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education regarding the assessment and remediation of human impact on our environment. It is a unique program that prepares students to look at all aspects of water and environmental problems from a range of perspectives including the Earth system, water movement (hydrology, fluid flow), environmental chemistry, geochemistry, and reactive transport. The Environmental Engineering degree program will prepare students to understand the necessary foundational chemistry, fluid flow and mixing mechanics, all within the context of the Earth system.

The environmental engineering program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to conduct independent research under faculty supervision during their junior and senior years. The environmental engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design projects to facilitate the student's understanding of the design process.

The professional aspects of civil and environmental engineering are emphasized and promoted by the activities of a student chapter of the American Society of Civil Engineers, in which all students of the department are eligible and encouraged to participate. In addition, a junior class field trip examines major infrastructure projects and environmental systems including tall buildings, bridges, stadiums, transportation systems, navigations systems, flood protection works, clean water supply, and wastewater systems. The field trip is offered in both the fall and spring.

Environmental Engineering students will be ready to work as environmental engineers remediating the environment on local and global scales with opportunities available in engineering consulting firms, government agencies, national laboratories, and industries requiring monitoring and advancement of remediation technologies. Additionally, the environmental engineering degree will prepare students for graduate study in Environmental Engineering programs.

Further details about the environmental engineering program may be found on the Web at ceees.nd.edu.

First Year of Studies

First-year students intending to major in civil engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

The following courses are applicable to students entering the College in 2025.

Sophomore Year

First Semester

CE 20110. Planet Earth w/lab	4
CE 30300. Intro to Env. Eng.	3
MATH 20550: Calculus III	3.5
CE 20150. Statics	3
Core Curriculum course+	3
	16.5

Second Semester

CE 20300. Global Change, Water & Energy	3
CE 20320. Env. Aquatic Chem	3
MATH 20580. Linear Alg. Diff. Equations	3.5
ACMS 30440. Prob. & Stats.	3
Core Curriculum course+	3
	15.5

Junior Year

First Semester

CE 30125. Comp. Methods	3
CE 20520. Environmental Earth Science elective	3
CE 30460. Fluid Mechanics	3
CE 40350. Env. Microbiology	3
Laboratory and Field Methods for Environmental Engineering	3
	15

Second Semester

CE 30320. Water Chemistry & Treatment	3
CE 30455. Env. Hydrology	3
CE 40450. Hydraulics	3
Core Curriculum course+	3
CE 40341. Biological Process Design	3
CE 30338. Design Tools for Env. Engineering	1
	16

Senior Year

First Semester

CE 40300. Geochemistry	3
CE 40460. Groundwater Hydrology	3
CE 40701. Principles of Practice	1
Core Curriculum course+	3
Core Curriculum course+	3
EG Elective	3
	16

Second Semester

CE 40420. Reactive Transport	3
CE 40702. Senior Design	3
EG Elective**	3
CEEES Elective	3
Core Curriculum course+	3
	15
Total credit hours required for degree	127

+See "University Core Curriculum" on the first page of the College of Engineering section.

***All electives are defined in the Academic Guide for the Department of Civil and Environmental Engineering & Earth Sciences, available on the department web site.*

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

The Department of Civil and Environmental Engineering and Earth Sciences offers the following minors: Minor in Environmental Earth Sciences, Resiliency & Sustainability of Engineering Systems Minor, and a Minor in Construction Management. Information and details regarding these minors can be found at https://engineering.nd.edu/departments-programs/undergraduate-programs/minors-in-engineering/.

The minor in construction management is open to any student in the College of Engineering not pursuing a bachelor of science in civil engineering; as well as any student in the School of Architecture. Students will experience multi-disciplinary content focused on construction management and design techniques. The minor includes three required courses and two additional elective courses. The curriculum is as follows:

CE 30610. Fundamentals of Construction Management	3
CE 40632. Construction Estimating and Scheduling	3
ARCH 40XXX. AutoCAD and BIM (Required for minor only)	3
Elective	3
Elective	3
	15

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Civil Engineering.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Computer Science and Engineering

Frank M. Freimann Professor of Computer Science and Department Chair:
Jane Cleland-Huang
Professor and Associate Chair:
Michael Niemier
Assoicate Professor and Director of Graduate Studies:
Timothy Weninger
Teaching Professor and Director of Undergraduate Studies:
Ramzi K. Bualuan
Associate Professor and Director of Inclusive Excellence and Engagement:
Taeho Jung
Assistant Teaching Professor and Director of the Bachelor of Arts in Computer Science Program:
William Thiesen
Professor and Vice President and Associate Provost for Teaching and Learning:
Ronald Metoyer
Frank M. Freimann Professor and Director of Lucy Family Institute for Data and Society:
Nitesh Chawla
Clare Boothe Luce Assistant Professor of Computer Science and Engineering:
Karla Badillo-Urquiola
Professor of the Practice and Director, Center for Civic Innovation:
Jay B. Brockman
Snyder Family Mission Collegiate Professor of Computer Science:
Erin Chambers
Fritz Duda Family Professor of Engineering:
Patrick J. Flynn
Leo E. and Patti Ruth Linback Professor of Engineering, Computer Science and Engineering:
X. Sharon Hu
Ted H. McCourtney Professor of Computer Science and Engineering:
Peter M. Kogge
Dennis O. Doughty Collegiate Professor of Engineering:
Walter Scheirer
Galassi Family Collegiate Professor in Computer Science and Engineering:
Yanfang Ye
Leonard C. Bettex Collegiate Professor of Computer Science:
Xiangliang (Lynn) Zhang
Professors:
Danny Z. Chen; Tijana Milenkovic; Yiyu Shi; Douglas Thain; Chaoli Wang
Associate Professors:
David Chiang; Adam Czajka; Meng Jiang; Collin McMillan; Aaron Striegel
Assistant Professors:
Karla Badillo-Urquiola; Tingyu Cheng; Diego Gómez-Zará; Siddharth Joshi; Fanxin Kong; Jia-Jun (Toby) Li; Spyridon Mastorakis; Joanna da Silva Santos
Assistant Professor of the Practice:
Dan Rehberg
Teaching Professor:
Peter Bui
Associate Teaching Professors:
Aaron Dingler; Shreya Kumar; Paul "Will" McBurney; Matthew Morrison
Professor Emeritus:
Kevin W. Bowyer
Research Professor Emeritus:
Gregory R. Madey

Program of Studies. The Department of Computer Science and Engineering offers programs of study that lead to the degrees of bachelor of science in computer science and bachelor of science in computer engineering. The program in computer engineering is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org. The program in computer science is accredited by the Computing Accreditation Commission of ABET, https://www.abet.org. The department also offers programs that lead to a master of science in computer science and engineering, and a Ph.D.

Program Goals. The goals of the programs in computer science and computer engineering are (1) to prepare all students for careers in the public or private sector; (2) to prepare outstanding students for graduate study; (3) to develop lifelong learning skills in all students; (4) to provide comprehensive education in computer science, including theoretical foundations, software and hardware systems, and applications; and (5) to ensure significant design experience including working in teams.

Computer Science Program Educational Objectives
Graduates of the Computer Science program will achieve the following objectives:

1. They will be technically qualified for practice in the profession; they will demonstrate the ability to specify, design, and implement software and/or hardware-software systems to meet customer requirements or to advance the state of the art; the ability to employ modern computer languages, environments, and platforms in such tasks; and the ability to apply knowledge of science and mathematics to such tasks;
2. They will be effective technical communicators, orally and in writing, and effective team members capable of working effectively in groups on computing problems;
3. They will be ethical professionals, capable of evaluating personal and professional choices in terms of codes of ethics and ethical theories and understanding the impact of their decisions on themselves, their professions, and on society;
4. They will be successful as graduates, either through professional employment in the private or public sector, or as students in graduate study. They will also be able to employ life-long learning tools and techniques to maintain their currency in the field.

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Computer Engineering Program Educational Objectives
Graduates of the Computer Engineering program will achieve the following objectives:

1. They will be technically qualified for practice in the profession; they will demonstrate the ability to specify, design, implement and verify software and/or hardware-software systems to meet customer requirements or to advance the state of the art; the ability to employ modern computer languages, environments, and platforms in such tasks; the ability to follow applicable engineering standards in the execution of such tasks; and the ability to apply knowledge of science and mathematics to such tasks;
2. They will be effective communicators, orally and in writing, and collaborative team members capable of working in groups across software/hardware/data boundaries on complex problems;
3. They will be ethical individuals, capable of evaluating personal and professional choices in terms of codes of ethics and ethical theories and understanding the impact of their decisions on themselves, their professions, and on society;
4. They will be successful as computer engineering graduates, either through professional employment in the private or public sector, or as students in graduate study. They will also be able to employ life-long learning tools and techniques to maintain their currency in the field.

Programs. Programs in the Department of Computer Science and Engineering follow the four-year curricula listed below. These include required and elective courses in the basic, pure, and applied sciences, as well as the humanities, Computer Science engineering, computer science, and computer engineering. Emphasis is on developing a mastery of the key principles underlying the organization, operation, and application of modern computers to real problems, with a solid grounding in math and science to permit a quantitative analysis of such solutions. In addition, central to both programs is the development of the ability to function, both independently and in multidisciplinary teams, and to be prepared for continued change in future computing technology and what effects it will have on all aspects of society. Opportunities for specialization in several professional computer disciplines are available. Students are individually assisted and advised in their choices of elective courses.

The Department of Computer Science and Engineering offers concentrations in five areas: Bioinformatics and Computational Biology, Media Computing, Mobile Computing, Cloud Computing, and Cyber Security. Each concentration is designed to offer a structured set of elective courses around an organized theme. Upon a student's successful completion of a CS/CPEG program with a chosen concentration, the concentration will appear on the student's transcript.

Further information about computer science and computer engineering programs may be found on the web at cse.nd.edu. Information about the Bachelor of Arts in computer science may be found at bacs.nd.edu.

PROGRAM IN COMPUTER ENGINEERING

The Program in Computer Engineering is jointly administered by the Department of Computer Science and Engineering and the Department of Electrical Engineering. The joint directors of the Computer Engineering program are Michael Niemier and Robert Stevenson. The program focuses on the intersection of hardware (digital logic devices, circuits, computer architectures, and embedded systems) and software (programming languages, operating systems, and algorithms). Modern design tools, techniques, and platforms are introduced early in the program, and continually used throughput to design, prototype, and analyze real digital computing systems to solve a given problem. All computer engineers participate in year-long, capstone design experience prior to graduation.

The following course schedule is applicable to the students entering the College in Fall 2025.

Program Requirements
To earn the BS CPEG, students must complete the following requirements

1. *Completion of University Core Curriculum requirements **(26 credits)**.* Note the Liberal Arts 1, 2 and 3 requirements will be covered by courses required by the College of Engineering and CPEG Requirements. Also note that the University Seminars can double count as another core requirement.
2. *Completion of the College of Engineering requirements **(22 credits)**.* Students must complete the following courses:
   - EG 10117 – Engineering Design (3 credits)
   - EG 10118 – Engineering Programming (3 credits)
   - MATH 10550 – Calculus I (4 credits)
   - MATH 10560 – Calculus II (4 credits)
   - CHEM 10171/11171 – Introduction to Chemical Principles (4 credits)
   - PHYS 10310 – General Physics I (4 credits)

   Additional College of Engineering degree requirements are covered by courses required by the Department of Computer Science and Engineering.
3. *Completion of the Computer Engineering (CPEG) degree requirements.*
   a. *CPEG mathematics and science requirement **(13.5 credits)**.* In addition to the College of Engineering mathematics and science requirements, students must also complete the following courses:
      - CSE 20110: Discrete Math (3 credits)
      - MATH 20580: Introduction to Linear Algebra and Differential Equations (3.5 credits)
      - ACMS 30440: Probability and Statistics or EE 30210 Random Phenomena (3 credits)
      - PHYS 10320: General Physics II (4 credits)

   b. *CPEG Core requirement **(26.5 credits)**.* Students must complete the following courses:
      - CSE 20311: Fundamentals of Computing (4 credits)
      - EE 20100: Introduction to Electrical and Computer Engineering (3 credits)
      - CSE 20xxx: Logic and Processor Design (4 credits)
      - CSE 20312: Data Structures (3.5 credits)
      - EE 20221: Signal & Information Systems (3 credits)
      - CSE 30321: Computer Architecture (3 credits)
      - NEW XXXX: CPEG Capstone Design I (3 credits)
      - NEW XXXX: CPEG Capstone Design II (3 credits)

   c. *CPEG Core Electives **(9 credits)**.* Students are required to take at least 3 courses from the following list:
      - EE 30122: System Theory and Application (3 credits)
      - EE 30132: Applied Embedded System Design (3 credits)
      - EE 30062: Fundamentals of Semiconductors (3 credits)
      - CSE 20289: Systems Programming (3 credits)
      - CSE 30341: Operating System Principles (3 credits)
      - CSE 30342: Digital Integrated Circuits (3 credits)
      - CSE 30151: Theory of Computing (3 credits)

   d. *CPEG Electives **(18 credits)**.* Students must complete 18 additional credits of CPEG elective courses from the following options. Please note that courses cannot double count within the CPEG major.
      - Any 30000+ EE or CSE course that is not one of the CPEG Core Requirements.
      - EE 20231: Digital Design for Smart Interconnected Systems (3 credits)
      - CSE 20289: Systems Programming (3 credits)
      - EE 20241: Electronic Devices and Systems (3 credits)

   e. *Technical Electives **(6 credits)**.* Students must complete 6 additional credits of technical elective courses as follows. Please note that courses cannot double count within the CPEG major.
      - Any 20000+ College of Engineering course
      - Any 30000+ College of Science course
      - MATH 20550 Calculus III (3.5 credits)
      - EE 10200 Introduction to Embedded Systems (3 credits)
      - Other First Year Technical Elective Engineering Courses
      - BIO/CHEM pre-med classes

   f. *Free Electives **(3 credits)**.* Students must complete 3 additional credits of elective courses. Students can choose from courses offered by University of Notre Dame.

4. *Earn a minimum of 124 hours of course credit.* Note that if multiple requirements are met using one course, additional coursework might be required to ensure the student achieves the 124 minimum required total credits.

More details can be found in the *Computer Engineering Undergraduate Handbook* on the web at https://cse.nd.edu/undergraduate.

COMPUTER SCIENCE PROGRAM

The Program in Computer Science focuses on the application of computers to real problems, especially in the design, development, and use of software. The program is designed to foster an understanding of the key properties of algorithms (the mathematical statements of how problems are to be solved), and how to recognize and design good algorithms to solve real problems in efficient fashions. The program also includes developing the ability to engineer large, efficient, portable, and scalable pieces of software that implement good algorithms in ways that are useful to the end users, and to do so in ways that use modern software development tools and techniques.

The following course schedule is applicable to the students entering the College in Fall 2025.

Program Requirements
To earn the BS CS, students must complete the following requirements

1. *Completion of University Core Curriculum requirements **(26 credits)**.* Note the Liberal Arts 1, 2 and 3 requirements will be covered by courses required by the College of Engineering and the Department of Computer Science Engineering. Also note that the University Seminars can double count as another core requirement.
2. *Completion of the College of Engineering requirements **(22 credits)**.* Students must complete the following courses:
   - EG 10117 – Engineering Design (3 credits)
   - EG 10118 – Engineering Programming (3 credits)
   - MATH 10550 – Calculus I (4 credits)
   - MATH 10560 – Calculus II (4 credits)
   - CHEM 10171/11171 – Introduction to Chemical Principles (4 credits)
   - PHYS 10310 – General Physics I (4 credits)

   Additional College of Engineering degree requirements are covered by courses required by the Department of Computer Science and Engineering.
3. *Completion of the Computer Science (CS) degree requirements.*
   a. *CS mathematics and science requirement **(14 credits)**.* In addition to the College of Engineering mathematics and science requirements, students must alsocomplete the following courses:
      - MATH 20550 – Calculus III (3.5 credits)
      - MATH 20580 – Introduction to Linear Algebra and Differential Equations (3.5 credits)
      - ACMS 30440 – Probability and Statistics (3 credits)
      - PHYS 10320 – General Physics II (4 credits)

   b. *CS Core requirement **(34.5 credits)**.* Students must complete the following courses:
      - CSE 20311 – Fundamentals of Computing (4 credits)
      - CSE 20110 – Discrete Math (3 credits)
      - CSE 20312 – Data Structures (3.5 credits)
      - CSE 20221 – Logic Design (3 credits)
      - CSE 20289 – Systems Programming (3 credits)
      - CSE 30321 – Computer Architecture (3 credits)
      - CSE 30151 – Theory of Computing (3 credits)
      - CSE 30332 – Programming Paradigms (3 credits)
      - CSE 30341 – Operating Systems (3 credits)
      - CSE 40113 – Algorithms (3 credits)
      - CSE 40175 – Ethics and Social Issues (3 credits)

   c. *CSE Electives **(18 credits)**.* Students must complete 18 additional credits of CSE elective course. Students have a choice from 30+ courses offered by the departments of Computer Science and Engineering and Electrical Engineering. For CS majors only, one CSE elective must be chosen from a list of designated project-based courses. (Up to 9 of the aforementioned elective credits may be fulfilled by courses offered by the Department of Electrical Engineering).
   d. *Technical Electives **(9 credits)**.* Students must complete 9 additional credits of technical elective courses. Students can choose from numerous courses offered by the College of Engineering and the College of Science.
   e. *Free Electives **(3 credits)**.* Students must complete 3 additional credits of elective courses. Students can choose from courses offered by University of Notre Dame.
4. *Earn a minimum of 126.5 hours of course credit.* Note that if multiple requirements are met using one course, additional coursework might be required to ensure the student achieves the 126.5 minimum required total credits.

Details about the specific courses and course options can be found in the *Computer Science Engineering Undergraduate Handbook* which can be found on the Computer Science Engineering website at https://cse.nd.edu under the undergraduate tab.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Computer Science and Engineering.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Electrical Engineering

Chair and Robert W. and Alice M. Bauchman Professor in Engineering:
Gregory L. Snider
H.C. and E.A. Brosey Professors of Electrical Engineering:
Panagiotis J. Antsaklis; Gregory Timp
Leonard Bettex Chair of Electrical Engineering:
Daniel J. Costello Jr. (emeritus)
Frank M. Freimann Professors of Electrical Engineering:
Gary H. Bernstein; Martin Haenggi; Bertrand Hochwald; Craig Lent; Wolfgang Porod
Stinson Professor of Nanotechnology:
Patrick J. Fay
Professors:
Peter H. Bauer (emeritus); William B. Berry (emeritus); Thomas E. Fuja; Monica Ghosh; Eugene W. Henry (emeritus); Christopher Hinkle; Anthony Hoffman; Yih-Fang Huang; Thomas H. Kosel (emeritus); J. Nicholas Laneman; Michael D. Lemmon; Hai Lin; Christine M. Maziar; Alan C. Seabaugh (emeritus); Ranjan Singh; Roxana Smarandache; Gregory L. Snider; Robert L. Stevenson
Associate Professors:
Jonathan Chisum; Douglas C. Hall; Scott Howard; Lei Liu; Thomas O'Sullivan; Ken D. Sauer (emeritus)
Assistant Professors:
Ningyuan Cao; Mengxue Hou; Kai Ni; Yasemin Ozkan-Aydin; Zhi Zheng
Research Professors:
Alexander Mintairov (emeritus); Alexei Orlov
Frank M. Freimann Collegiate Research Professor:
Thomas Pratt
Teaching Professor:
R. Michael Schafer
Concurrent Faculty:
Sharon Hu; Siddharth Joshi; Ed Kinzel

Program Goals. The goals of the Department of Electrical Engineering's academic programs are to provide quality education and to foster leading-edge research as means of training highly qualified engineers and leaders of tomorrow, in keeping with the mission of the University of Notre Dame.

Program of Studies. The Department of Electrical Engineering offers programs of study that lead to the degrees of bachelor of science in electrical engineering and bachelor of science in computer engineering. Both programs are accredited by theEngineering Accreditation Commission of ABET, http://www.abet.org, under the General Criteria and the Program Criteria for Electrical, Computer, Communications, Telecommunication(s) and Similarly Named Engineering Programs. The department also offers programs that lead to a master of science in electrical engineering and a Ph.D.

Program in Electrical Engineering
The four-year curriculum, listed below, includes required and elective courses in the pure and applied

sciences, the humanities, and electrical engineering. Emphasis is on the mastery of fundamental principles, with added depth and provision for specialization in the major professional areas of communications, control systems, electronic circuit design and analysis, microelectronics and integrated circuit fabrication, photonics, and signal processing. Students are individually assisted and advised in their choices of elective courses. Departmental facilities include laboratories for electronics, circuits, electrophysics, control systems, communications, integrated circuit fabrication, photonics, microwave circuit/device characterization, and digital signal/image processing.

Concentrations are available in the following areas for students: Bioengineering, Communications, Electromagnetics, Energy, Multimedia, Photonics, Robotics, Semiconductors, and Nanotechnology.

The following course schedule is applicable to the students entering the College after 2023.

Program Requirements
To earn the BSEE, students must complete the following requirements:

1. *Completion of University Core Curriculum requirements (26 credits).* Note the Liberal Arts 1, 2 and 3 requirements will be covered by courses required by the College of Engineering and the Department of Electrical Engineering.
2. *Completion of the College of Engineering requirements (33 credits).* Students must complete the following courses:
   - EG 10117. Engineering Design
   - EG 10118. Engineering Programming
   - MATH 10550. Calculus I
   - MATH 10560. Calculus II
   - MATH 20550. Calculus III
   - MATH 20580. Introduction to Linear Algebra and Differential Equations
   - CHEM 10171/11171. Introduction to Chemical Principles
   - PHYS 10310. General Physics I
   - PHYS 10320. General Physics II
3. *Completion of the Electrical Engineering degree requirements.*
   a. *EE Core requirement (24 credits).* Students must complete the following courses:
      - EE 20100/21100. Introduction to Electrical Engineering
      - CSE 20122. Introduction to Computing for Electrical Engineering
      - EE 20221. Signal and Information Systems
      - EE 20231. Digital Design for Smart, Interconnected Systems
      - EE 20241/21241. Electronic Devices and Circuits
      - EE 30210. Random Phenomena in Electrical Engineering
      - EE 41190. Senior Design I
      - EE 41290. Senior Design II

   b. *EE Core Elective Requirement (9 credits).* Students must complete at least three of the following four classes:
      - EE 30062. Fundamentals of Semiconductors
      - EE 30122. System Theory and Applications
      - EE 30132. Applied Embedded System Design
      - EE 30142. Analog and Digital Circuit Design
      - EE 30152. Applications of Electromagnetics

   c. *EE Lab Elective (3 credits).* Students must complete at least one of the following classes:
      - EE 40023/41023. Communication Systems
      - EE 40024/41024. Control Systems
      - EE 40043/41043. RF & Microwave Circuits for Wireless Communications
      - EE 40063/41063. IC Fabrication
      - EE 40064/41064. Optics and Photonics

   d. *EE Electives (15 credits).* Students must complete 15 additional credits of EE elective course. Students have a choice from over 20 courses offered by the departments of Electrical Engineering and Computer Science and Engineering.

   e. *Technical Electives (9 credits).* Students must complete 9 additional credits of technical elective courses. Students can choose from numerous courses offered by the College of Engineering and the College of Science.
4. *Earn a minimum of 125 credit hours of course credit (6 credits).* While the above requirements total 119 credits there is an additional requirement of completing a minimum of 125 credits. These credits can be earned by taking any graded course at the university and is often satisfied by students completing a minor or second major.

Details about the specific courses and course options can be found in the *Electrical Engineering Undergraduate Handbook* which can be found on the Electrical Engineering website at https://ee.nd.edu under the undergraduate tab.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online using the tools at classsearch.nd.edu. Use the tools to select a semster and the subject *Electrical Engineering.*

Certain graduate courses are open to advanced undergraduates with permission of the department.

Interdepartmental Engineering

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Engineering (Non-Departmental).* Course descriptions can be found by clicking on the subject code and course number in the search results.

Dual Degree Programs

DUAL DEGREE PROGRAM WITH THE COLLEGE OF ARTS AND LETTERS

Coordinators:

Michael Ryan
Associate Dean
College of Engineering

College of Arts and Letters
Advising dean for each cohort

Program of Studies. The five-year dual degree program between the College of Arts and Letters and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of arts from the College of Arts and Letters and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 1952, offers students the advantages of both a liberal and a technical education. The student completing one of these combination programs has a background in the humanities and social sciences as well as a degree from one of the programs offered by the College of Engineering. Advisors for the program are available for consultation about the advisability of entering the program and about meeting the particular needs of each student pursuing this program. Qualified students are eligible to receive modest scholarship support from the John J. Reilly Endowed Scholarship program during their third, fourth, and fifth years of study.

The decision to enter the program ideally should be made prior to beginning the sophomore year, although students can also enter the program at a later stage. Three sets of requirements must be met by students in the program: University requirements, Arts and Letters requirements and Engineering requirements, as the following table indicates.

University Requirements

Six courses in the liberal arts:	
Liberal Arts 1. Quantitative Reasoning	3
Liberal Arts 2. Science and Technology	3
Liberal Arts 3. Another Quantitative Reasoning or Science and Technology	3
Liberal Arts 4. Arts and Literature or Advanced Languages and Cultures	3
Liberal Arts 5. History or Social Science	3
Liberal Arts 6. Integration, or a course from an area not yet chosen in 4 or 5 above	3
Theology/Philosophy:	
Theology	6
Philosophy/Catholicism and the Disciplines	6
Moreau Program	2
	32*

**Please consult the University Requirements section of this Bulletin for details.*

Arts and Letters Requirements

College Seminar	3
Literature	3
History	3
Foreign Language* (1–4 courses)	3–14
Fine Arts	
Social Science	
Major (minimum)	27
	42/45

Engineering Requirements

CHEM 10171	4
MATH 10550, 10560, 20550, 20580	15
PHYS 10310, 10320	8
EG 10111, 10112	6
	33

Major

approximately 60 credits (see specific major for details)

Engineering Program

Engineering degree program (required courses and program or technical electives)	69–75
	Total : 170–179

Schematic Program of Studies

The exact sequence of courses will vary based on the specific majors selected.

First Semester	
WR 13100. Writing and Rhetoric	3
Intro to Theology/Philosophy	3
CHEM 10171. General Chemistry: Fundamental Principles	4
EG 10111. Introduction to Engineering Systems I	3
MATH 10550. Calculus I	4
Moreau First Year Seminar	1
	18
Second Semester	
University Seminar (Theo/Philo recommended)+	3
CHEM 10122. General Chemistry: Biological Processes	3
EG 10112. Introduction to Engineering Systems II	3
MATH 10560. Calculus II	4
PHYS 10310. General Physics I	4
	17
Third Semester	
Modern Language	3
PHYS 10320. General Physics II	4
MATH 20550. Calculus III	3.5
Engineering Program†	3
Engineering Program	3
	16.5
Fourth Semester	
Theology/Philosophy	3
College Seminar	3
Modern Language	3
MATH 20580. Linear Algebra and Differential Equations	3.5
Engineering Program	3
Engineering Program	3
	18.5
Fifth Semester	
History/Social Science	3
History/Social Science	3
Engineering Program	3
Arts and Letters Major††	3
Engineering Program	3
Engineering Program	3
	18
Sixth Semester	
Philosophy/Theology	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18
Seventh Semester	
Literature	3
History/Social Science	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
	18
Eighth Semester	
Fine Arts	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
	18
Ninth Semester	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	18
Tenth Semester	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
Moreau Senior Capstone	1
	19

+ The University Seminar may be selected from an appropriate history, social science, fine arts or literature course, or the first course in theology or philosophy.

** Students who place out of lower level language courses must take at least one language course at the appropriate level.*

† Courses specified by the student's major engineering department.

†† Courses necessary to fulfill the requirements for a major in the student's major arts and letters department.

Engineering and Arts and Letters students who are pursuing the Reilly Arts and Letters Engineering Dual-Degree Program are limited by the credit maxima set by the College of Engineering. Dual-degree students seeking permission to overload must request approval from both Colleges.

DUAL DEGREE PROGRAM WITH THE MENDOZA COLLEGE OF BUSINESS

Coordinators:

Michael Ryan
Associate Dean
College of Engineering
Kristin McAndrew
Director of Admissions
Master of Business Administration Program

Program of Studies. The five-year dual degree program between the Mendoza College of Business and the College of Engineering enables the student to earn the bachelor of science in a chosen field of the College of Engineering and the master of business administration.

This program, instituted in 1991, offers students the opportunity to better integrate study in engineering and in management. The student completing this program has a background in the management sciences, as well as the first professional degree in one of the fields of engineering. Because it is a demanding program, only those students of superior scholastic ability, who have both the aptitude and motivation necessary for the combined graduate and undergraduate program, should apply. Advisors for the program are available for consultation about the advisability of applying for the program and about meeting the particular needs of each student pursuing this program.

This program is open only to those currently enrolled Notre Dame students who have completed three years of a degree program in the College of Engineering. Students interested in the MBA/engineering program should apply to the MBA program during their junior year. To facilitate the application process, students should take the Graduate Management Admission Test (GMAT) by December of their junior year.

An applicant who is not admitted to the dual degree engineering/MBA program continues in the undergraduate engineering program and completes his or her undergraduate engineering program in the usual four-year time frame.

As a general rule, it is expected that a student accepted to this program will take two courses required for the undergraduate engineering degree during the summer session following the junior year. The following schedule of classes is an example of how a program might be accomplished.

Students in the five-year engineering/MBA program are also required to:

(1) Complete a minimum of 48 MBA credit hours and maintain a GPA of at least 3.0 to successfully complete the program.

(2) Take only MBA courses in their fourth year and be able to complete 16 MBA credits plus all outstanding engineering degree requirements in the fifth year.

(3) Maintain full-time student status (minimum course load of 12 credit hours per semester).

First Year, Sophomore Year, Junior Year:
As outlined for individual engineering degree programs in this *Bulletin*. 98–104 credit hours.

Summer Session Following Junior Year:

Arts and Letters course+	3
Arts and Letters course+	3
Math Review Workshop*	0
Accounting Review Workshop*	0

The MBA curriculum divides each semester into two modules.

Senior Year
36 credits, all MBA courses
First Semester, Module 1:

ACCT 60100, Financial Accounting	2
MBET 60340. Conceptual Foundation of Business Ethics	2
MGT 60100. Statistics	2
MGT 60300. Organizational Behavior	2

First Semester, Interterm Week:

Professional Development Seminar	1
Communications Seminar++	1

First Semester, Module 2:

ACCT 60200. Cost Accounting	2
FIN 60400. Finance I	2
FIN 60210. Microeconomic Analysis	2
MARK 60100. Marketing Management	2

Second Semester, Module 3:

FIN 70600. Finance II	2
FIN 60220. Macroeconomic Analysis	2
MGT 60900. Strategic Decision Making	2
Free Elective	2

Second Semester, Interterm Week:

Values in Decision Making	1
Required Course (TBD)	1

Second Semester, Module 4:

MGT 60400. Leadership and Teams	2
MGT 60700. Operations Management	2
Free Elective	2

Fifth Year
12 credits, MBA courses and remainder engineering courses
First Semester, Module 1:

MGT 60200. Problem Solving	2
Management Communication Elective I	2
(Floating Optional Elective*	2)

**Students have the option to take one additional two-credit-hour elective now or in any remaining module.*

First Semester, Module 2:

Ethics Elective	2
Management Communication Elective	2
(Floating Optional Elective	2)

Second Semester, Module 3:

Free Elective	2
Free Elective	2
(Floating Optional Elective	2)

Second Semester, Interterm Week:

(OPTIONAL: Two one-credit-hour electives OR	
Corporate Case Studies OR	
Offshore Program: China or Brussels	2)

Second Semester, Module 4:

Free Elective	2
Free Elective	2
(Floating Optional Elective	2)

+See "Arts and Letters Core" on the first page of the College of Engineering section.

++Special one/two-week courses. All other MBA courses are seven weeks in length.

**Occurs during August Orientation*

Total for both degrees: 128–134 undergraduate, 48 MBA

One MBA course will be accepted as an elective or technical elective by each College of Engineering program. No more than two MBA courses may be accepted toward an undergraduate degree from the College of Engineering. Students are advised to check specific program requirements.

DUAL DEGREE PROGRAM WITH THE COLLEGE OF SCIENCE

Coordinators:

Michael Ryan
Associate Dean
College of Engineering

Malgorzata Dobrowolska-Furdyna
Associate Dean
College of Science

Program of Studies. The five-year dual degree program between the College of Science and the College of Engineering enables the student to acquire degrees from both colleges—the bachelor of science from the College of Science and the bachelor of science degree in a chosen program of the College of Engineering.

This combination program, instituted in 2013, offers students the advantages of the liberal arts aspects of natural science and mathematics education coupled with a strong technical education. Because a student may enter the program from either college, both colleges have agreed to a certain degree of flexibility in allowing students to meet degree requirements. The following guidelines apply to all students intending to pursue this dual degree program, regardless of the student's initial college:

(1) Students must complete the degree requirements of both colleges, including University requirements (satisfied only once for both degrees), college requirements (with liberal appropriate substitutions for similar courses), and major requirements (with limited appropriate substitutions for similar content). Students may double-count more than one course between both degrees as appropriate to eliminate unnecessary duplication in course content.

(2) Students must earn 30 usable (degree-appropriate) credits past engineering degree requirements. Usable credits are defined as credits—including AP, IB, credit-by-examination and course credits—that are of high enough level that they could be applied to degree requirements. For example, additional AP credits in economics could be used to satisfy a free elective credit in a degree program, but AP credit for statistics (ACMS 10145) cannot be used in either degree program because the class level is lower than the statistics requirements for any degree program in science or engineering.

(3) Students must complete sequences of courses in mathematics, chemistry and physics, as described in the course sequences below and the corresponding table on the following page. This requirement ensures that all necessary material is covered through a sequence of classes, and that students do not duplicate content by taking classes from more than one approved sequence.

(4) The exact set of courses a student must complete to earn both degrees will be determined by agreement between the appropriate associate/assistant deans of each college and will, naturally, depend on the pair of majors selected. Ordinarily, a student will present a plan of study that incorporates the above rules for approval.

	ACMS/Statistics	Mathematics	Physics	Chemistry	Other Science
AERO ME	Math 3* Chem 1 or 3 Phys 1	Math 1 or 2* Chem 1 or 3 Phys 1	Math 1a, 2*, 3* or 4 Chem 1 or 3 Phys 3	Math 1a, 2* or 3* Chem 4 Phys 1	Math 1a, 2* or 3* Chem 1 or 3 Phys 1
CE	Math 3 Chem 1 or 3 Phys 1	Math 1 or 2 Chem 1 or 3 Phys 1	Math 1, 2, 3 or 4 Chem 1 or 3 Phys 3	Math 1, 2 or 3 Chem 4 Phys 1	Math 1, 2 or 3 Chem 1 or 3 Phys 1
CHEG	Math 3 Chem 2 or 4 Phys 1	Math 1 or 2 Chem 2 or 4 Phys 1	Math 1, 2, 3 or 4 Chem 2 or 4 Phys 3	Math 1, 2 or 3 Chem 4 Phys 1	Math 1, 2 or 3 Chem 2 or 4 Phys 1
CPEG CS EVEG EVES	Math 3 Chem 1 or 3 Phys 1	Math 1 or 2 Chem 1 or 3 Phys 1	Math 1a, 2, 3 or 4 Chem 1 or 3 Phys 3	Math 1a, 2 or 3 Chem 4 Phys 1	Math 1a, 2 or 3 Chem 1 or 3 Phys 1
EE	Math 3 Chem 1 or 3 Phys 2	Math 1 or 2 Chem 1 or 3 Phys 2	Math 1, 2, 3 or 4 Chem 1 or 3 Phys 3	Math 1, 2 or 3 Chem 4 Phys 2	Math 1, 2 or 3 Chem 1 or 3 Phys 2

** AERO and ME students need not take AME 30314 because it duplicates content of MATH/ACMS 20750. However, they must take the 0-credit Vibrations and Controls make-up sequences through AME.*

Approved Math Sequences:

1. MATH 10550, 10560, 20550, 20580, 30650 *CE, CHEG, EE*

1a. MATH 10550, 10560, 20550, 20580 *AERO, CPEG, CS, EVEG, EVES, ME*

2. MATH 10550, 10560, 20550, 20610, 20750
3. MATH 10550, 10560, ACMS 20550, 20750, 20620
4. MATH 10550, 10560, 20550, PHYS 20451, 20452

Approved Chemistry Sequences:

1. CHEM 10171/11171, 10122 *All EG (except CHEG)*
2. CHEM 10171/11171, 10122, 10172/11172, 20273 *CHEG*
3. CHEM 10171/11171, 10172/11172
4. CHEM 10181/11181, 10182/11182, 20283/22283, 20284/22284

Approved Physics Sequences:

1. PHYS 10310, 10320 *All EG (except EE)*
2. PHYS 10310, 10320, 20330 *EE*
3. PHYS 10411, 10424, 20435, 20464

Officers of Administration

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Director for Strategic Initiatives and Operations

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Chair of the Department of Chemical and Biomolecular Engineering

DIOGO BOLSTER, Ph.D.
Chair of the Department of Civil and Environmental Engineering and Earth Sciences

JANE CLELAND-HUANG, Ph.D.
Chair of the Department of Computer Science and Engineering

GREGORY L. SNIDER, Ph.D.
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Hingham, Massachusetts

JANE DEFLORIO
New York, New York

JACQUELINE A. DIMPEL
Salt Lake City, Utah

DENNIS O. DOUGHTY
Osprey, Florida

MR. ANTHONY F. EARLEY, JR.
Bloomfield Hills, Michigan

MR. JOHN F. GAITHER, JR.
Evansville, Indiana

NICHOLAS J GALASSI
Hindsale, Illinois

MR. VINCENT N. GREGGO
Wilmington, Delaware

PAUL J. GUERCIO, JR.
Moran, Wyoming

MS. DIANE G. GULYAS
Johns Island, South Carolina

THOMAS HEALY
South Bend, Indiana

LUIS HERNANDEZ
Cary, North Carolina

MR. JAMES H. HUNT, JR.
McLean, Virginia

CHRISTINE JOSEPH
Richmond, Texas

PATRICIA C. KILGALLON
Boca Raton, Florida

MR. DENNIS M. MALLOY
Houston, Texas

KENNETH R. MARINO
Pittsburgh, Pennsylvania

JOHN A. MARTELL
Granger, Indiana

MR. DONALD J. MASSARO
Half Moon Bay, California

HENRY J. MASSMAN, IV
Mission Hills, Kansas

ROSE-MARIE MAZANEK
Indianapolis, Indiana

MR. JOHN E. McNULTY
Reno, Nevada

WAYNE W. MURDY
Englewood, Colorado

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Omaha, Nebraska

MATTHEW O'DONNELL
Seattle, Washington

MR. MICHAEL A. O'SULLIVAN
Tequesta, Florida

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Center Valley, Pennsylvania

MR. ROBERT N. SCHLECKSER
Naples, Florida

CAROLYN S. SERINGER
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CHRISTOPHER G. SLATT
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Six Mile, South Carolina

MR. TIMOTHY J. STEIGAUF
Saint Paul, Minnesota

DEACON PATRICK TOOLE, JR.
Westport, Connecticut

DR. JAY TRAVERSE
Minneapolis, Minnesota

PETER K. TULLY
Locust Valley, New York

MR. RICHARD P. WOLSFELD, JR.
Scottsdale, Arizona

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Keough School of Global Affairs

The Donald R. Keough School of Global Affairs is the first new school at the University of Notre Dame in nearly a century. In keeping with Notre Dame's mission to place scholarship in service to the common good, the Keough School advances integral human development through research, policy, and practice; transformative educational programs; and partnerships for global engagement.

Founded in 2014, the Keough School builds on the strengths of existing institutes and centers focused on international research, scholarship, and education at Notre Dame. The Keough School educates and trains global affairs professionals, preparing students for effective and ethical professional leadership in governments, nongovernmental organizations, and the private sector. The Keough School welcomed its first class of students in its Master of Global Affairs in 2017, inaugurated a new Supplementary Major in Global Affairs in 2019, and launched the first major in Global Affairs in 2022.

The Keough School offers Notre Dame students a wide range of globe-spanning academic opportunities and programs of study in addition to the extensive study abroad and other options available through Notre Dame International.

Details about the Donald R. Keough School of Global Affairs can be found online at http://keough.nd.edu/.

CURRICULAR AND DEGREE

The Keough School of Global Affairs offers curricula leading to the degree of Bachelor of Arts in Global Affairs

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

- Asian Studies (24 hours)
- Peace Studies (24 hours)

ADVANCED PLACEMENT / INTERNATIONAL BACCALAUREATE CREDIT:

The University will not accept AP, IB, or SAT-II credits in lieu of University Core Requirements. Similarly, the Keough School will not accept AP/IB credits in lieu of School requirements. Certain curricular programs may accept AP/IB credit in lieu of major or minor requirements. See the individual program entries for specific details. AP/IB scores may also be used in lieu of a placement exam to place students into upper-level courses.

Degree requirements for the Keough School of Global Affairs
Students in the Keough School of Global Affairs are required to complete 123 degree-countable credits. They must also complete all University and School requirements as well as the requirements for one major program of study.

SUMMARY OF SCHOOL REQUIREMENTS:

Students in the Keough School of Global Affairs must fulfill the following specific requirements.

University requirements are described under "University requirements," in the front section of this *Bulletin.*

School requirements are described below:

Foreign Language Requirement. By graduation students must have achieved intermediate proficiency II or higher in a language other than their native language that is used as a means of communication in the contemporary world. Students who have already achieved this level of language competence before entering Notre Dame must take at least one 3-credit language course at the University. These students may choose to pursue the additional course as either an advanced course in the language in which they have achieved proficiency, or an introductory course in a new language that would expand and enrich the direction of their Notre Dame studies and career aspirations, and potentially lead to deeper study of the new language.

Keough Interdisciplinary Seminar (KSEM). A 3-credit course requirement for all students in the Keough School and can only be taken once.

Cultural Immersion Experience requirement. Students pursuing a degree in the Keough School must participate in an approved cultural immersion experience, bracketed by preparatory and reflective coursework. This requirement includes three components:

- Foundations of Cultural Analysis. This is a 3-credit course that prepares students to undertake a theoretically informed and empathetic cross-cultural experience.
- A Cultural Immersion Experience. The CIE emphasizes the importance of understanding and empathizing with diverse cultures, a key aspect of fostering effective global citizenship and service. As part of the CIE, students engage in an international or domestic program, project, or experience that immerses them in a culture different from their own. This immersion typically lasts for six weeks or more, allowing students to gain a substantial and meaningful exposure to different cultural environments, enriching their global perspective and skills in cross-cultural communication and collaboration.
- Reflections on Cultural Engagement and Analysis. This is a 1-credit post-experience course that provides students with a framework for critical reflection and conceptualization on their cultural immersion experience.

Keough Ethical Practice Seminar (KEPS). A 3-credit course that analyzes the practice of ethical reasoning and analysis in professional and public settings relevant to global affairs.

Pass/Fail Option. The Academic Code allows juniors and seniors to apply to their Dean (or Dean's designee) to take one course per semester on a pass/fail basis. The course must be non-major, non-required elective course. The declaration must be made during the enrollment period of each semester, and once made, the declaration is irreversible. Note that some courses do not have the pass/fail option.

STUDENT AWARDS AND PRIZES:

Kellogg Institute for International Studies
John J. Kennedy Prize is awarded annually for the best senior essay on Latin America. It carries a monetary prize and recognize the recipient's high-quality work at Notre Dame.

Considine Award is given annually for outstanding student contributions to the study of or service to the Catholic Church in Latin America.

Kroc Institute for International Peace Studies
Peter Yarrow Award in Peace Studies is awarded to a graduating senior in the supplementary major or minor in peace studies who demonstrates academic excellence in peace studies alongside a commitment to peace and justice in the world.

Peace Studies Senior Seminar Essay Awards are given to peace studies seniors who have demonstrated excellence in peace studies research and academic writing in the foundational senior seminar course

Pulte Institute for Global Development
Pulte Institute Student Fellowship supports Social Entrepreneurship internship opportunities for students. Initially made possible by a generous gift from Rick and Molly Klau in 2018, these internships allow students to be trained as social entrepreneurs through experiential learning on the front lines of development work across the globe.

KEOUGH SCHOOL PROGRAMS:

The programs offered by the Keogh School of Global Affairs include a major, supplementary majors, and minors, which are interdisciplinary and multidisciplinary. Every Keough student must complete one major sequence. Supplementary majors and minors are optional and may be taken to supplement or enhance a student's major but do not lead to graduation in and of themselves.

Major
The Keough School of Global Affairs currently offers one major in Global Affairs.

Supplementary majors are those that cannot stand alone in qualifying a student for an undergraduate degree so must be taken in conjunction with a primary major. The Keough School currently offers two supplementary majors: Asian Studies and Peace Studies.

Minors
Minors are typically five-course sequences. The Keough School offers the following minors:
- Asian Studies
- Civil and Human Rights
- European Studies
- Irish Studies
- Peace Studies
- Social Entrepreneurship and Innovation

Electives
In addition to University, School, and major requirements, the Keough School also offer a wide range of courses that are open to non-majors who have met any necessary prerequisites.

Global Affairs

Associate Director:
Kasey Swanke

The Global Affairs major provides students with a rigorous program of study that integrates knowledge, theory and methods of inquiry from many disciplines. It is grounded in a human-centered approach and focuses on global challenges to human flourishing such as climate change, increasing inequality and poverty, flows of refugees and migrants, human and civil rights violations and deadly conflict, and the policies and practices that address them.

Students can declare the Global Affairs major in their first year, and students declaring the major in their sophomore year can typically still finish the requirements on time. Students pair the major with a variety of other majors, supplementary majors, and minors on campus. With prior approval, students may satisfy major requirements through study abroad programs. When necessary, students may satisfy a limited number of major requirements through other departments' courses covering comparable content. These "waive-and-replace" instances are granted only with the permission of the associate director of the Global Affairs major and are subject to strict limitations.

Major (33 credits)
Introduction to Global Affairs and Integral Human Development (3 credits)

Global Politics and Policy (3 credits)

Quantitative Analysis for Global Affairs (3 credits)

Economics for Global Affairs (3 credits)

Research Design for Global Affairs (3 credits)

Global Affairs Electives (15 credits)

Capstone Seminar (3 credits)

SAMPLE STUDY PLAN

First Year
First Semester
1. Intro to Global Affairs and Int Human Devlp
2. Quantitative Analysis (WKQR)
3. Language
4. Writing and Rhetoric
5. Free Elective #1
6. Moreau First Year Seminar

Second Semester
1. Foundations of Cultural Analysis
2. Global Affairs Elective #1
3. Language
4. USEM (+ Core Requirement)
5. Free Elective #2

Second Year
First Semester
1. Global Affairs Elective #2
2. Keough School Seminar
3. Language
4. Core Requirement
5. Free Elective #3

Second Semester
1. Research Design for Global Affairs
2. Global Politics and Policy
3. Language
4. Core Requirement
5. Free Elective #4

Third Year
First Semester
1. Global Affairs Elective #3
2. Ethical Practice Seminar
3. Core Requirement
4. Free Elective #5
5. Free Elective #6

Second Semester
1. Global Affairs Elective #4
2. Economics for Global Affairs (WKSS)
3. Core Requirement
4. Free Elective #7
5. Free Elective #8

Fourth Year
First Semester
1. Global Affairs Capstone
2. Core Requirement
3. Core Requirement
4. Free Elective #9
5. Free Elective #10
6. Reflections on Cross-Cultural Engagement (1 cr)

Second Semester
1. Global Affairs Elective #5
2. Core Requirement
3. Free Elective #11
4. Free Elective #12
5. Free Elective #13
6. Moreau Senior Capstone (1 credit)

Notes:

This sample plan is only one example for how students can time their required courses. The course sequencing can be flexible to accommodate a semester study abroad, for example, and students can seek advising for help.

Students pursuing a Bachelor of Arts in Global Affairs can use free elective space to complete minors, some majors, or pre-health requirements.

Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

COURSE DESCRIPTIONS

All of the courses associated with the global affairs major can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by selecting "Class Search" and choosing the Global Affairs subject. Global Affairs electives can be found through the GLEL attribute search.

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Asian Studies

Director:
Michel Hockx
Director of Undergraduate Studies:
Alexander Hsu

The **Liu Institute for Asia and Asian Studies'** program in Asian Studies introduces students to the complexity of Asian life and thought, on the continent, among its diasporas, and beyond. Students select courses in a wide variety of fields, such as anthropology, East Asian languages and cultures, economics, film, television, and theatre, history, political science, and psychology. The Liu Institute for Asia and Asian Studies also provides enriching activities such as lectures, films, gatherings, and grant opportunities to students interested in Asia. Students with the supplementary major or the minor in Asian Studies will be very desirable employees of international business or accounting firms, nongovernmental organizations, and service organizations. They will be well prepared for graduate school in a discipline, or for a professional school such as law or business. The supplementary major and the minor in Asian Studies provide recognition of students' training in this significant aspect of the world.

The **Supplementary Major** in Asian Studies emphasizes the study of Asia, broadly defined, as an integral part of the world today. Students study both historical and contemporary aspects of culture, society, politics, literature, language, religion, etc. Required classes stress interdisciplinarity through our intra-university offerings.

Through the interdisciplinary nature of the major, classes draw from a broad range of topics, enabling the student to come away with a holistic and comprehensive study of Asia, including both humanistic and social scientific approaches to study.

Requirements for the Supplementary Major:

Asia-related courses from each of the following disciplines: (Total of 24 credit hours)

- One history: one class in ancient, early, or modern history (3 credit hours)
- One literature/culture (East Asian Languages and Cultures, English) (3 credit hours)
- One social science (anthropology, economics, political science, psychology, or sociology) (3 credit hours)
- One humanities (theology or philosophy) OR an additional literature/culture (3 credit hours)
- Three general electives (can include up to 6 credit hours of language) (9 credit hours)
- One upper-level course taken during the senior year that culminates in a capstone essay (3 credit hours)

The Minor in Asian Studies
Students who are contemplating graduate study in a particular area of the world or a career in international business or government—as well as those who are generally interested in the region—are well served by the minor in Asian Studies. It provides a well-rounded introduction to the world's most populous region. The minor in Asian Studies is a very appropriate accompaniment to majors in anthropology, East Asian languages and cultures, history, political science, economics, or other arts and letters departments. It is also suitable for students in the Mendoza College of Business, the College of Science, and other Colleges and Schools at our University.

Students should meet with the director of undergraduate studies (DUS) as early as possible in their academic career in order to plan their courses. They should also meet with the DUS each semester to select approved courses.

Requirements for the Minor:

Asia-related courses fulfilling each of the following: (Total of 15 credit hours)

- Four courses from at least three different disciplines (history, literature/culture, humanities, social sciences; may include up to one language course) (12 credit hours)
- One upper-level course taken during the senior year that culminates in a capstone essay (3 credit hours)

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Asian Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Civil and Human Rights

Associate Director:
Arlene Montevecchio

The Klau Institute for Civil and Human Rights seeks to make the study of civil and human rights a centerpiece of education at the University of Notre Dame. Through academic programs and research initiatives the Klau Institute engages students with questions of justice and human dignity, both at home and around the globe. The institute also works to build a vibrant intellectual community of faculty, staff, and students at all levels of the university who seek to enrich their independent work on pressing problems by employing a civil and human rights lens.

Minor in Civil and Human Rights
The Minor in Civil and Human Rights emphasizes a unified study of domestic and international civil and human rights. Core courses introduce students to the most pressing issues of civil and human rights today, in the United States and abroad. Elective courses then allow students to continue their studies by deepening their focus on a particular topic or expanding the breadth of their understanding of a fuller range of civil and human rights issues.

The Minor in Civil and Human Rights has the following requirements (15 credits total):

- Two core courses, one domestically focused and one internationally focused (6 credits)
- Three elective courses, drawn from a wide variety of domestic and international topics (9 credits)

For more complete information about the minor in Civil and Human Rights and associated opportunities for Klau Institute Student Affiliates, please consult our website at https://klau.nd.edu/academics/minor-in-civil-and-human-rights/. Questions about the minor can be directed to Arlene Montevecchio at amonteve@nd.edu.

European Studies

Director of Undergraduate Studies:
Roy Kimmey

The **Nanovic Institute for European Studies** is dedicated to enriching the intellectual culture of Notre Dame by creating an integrated, interdisciplinary home for students to explore the evolving ideas, cultures, beliefs, and institutions that shape Europe today. In addition to offering a suite of grant opportunities and events, the Institute supports an interdisciplinary curriculum in European studies serving students across the University through a Minor in European Studies open to all undergraduates.

The Minor
The Institute's Minor in European Studies (MES) invites students from all disciplines to explore the ways in which Europe has and continues to shape the world. Whether studying mechanical engineering or business marketing, students are encouraged to enrich their academic experience by adding a European dimension to their primary field of study. Rooted in the humanities, students in the MES will graduate with proficiency in a European language, a nuanced historical understanding of European society and culture, and the practical research, writing, and diplomatic skills needed to apply this knowledge to the most pressing issues facing Europe and the world today. Graduates of the Minor in European Studies have gone on to work in a variety of fields from law to non-governmental organizations to finance and politics.

MES Requirements (15 total credit hours)

European language (3 credit hours)
- The course must be in an approved European language at the intermediate II level or above.

European Studies foundational seminar (3 credit hours)
- The central course in the minor, this seminar invites students to consider the foundational ideas, themes, and events that have and will continue to shape Europe and its peoples.
- Offered in the fall, this writing intensive seminar should be taken during the junior or sophomore year.

Nine credit hours in MES courses
- Nine credit hours can be acquired through a combination of three-credit and one-credit courses carrying the MESE attribute.

Funding Opportunities
All undergraduates at the University of Notre Dame are eligible for Nanovic grant funding to support their academic and professional endeavors in Europe. The Institute offers research, internship, service, and language training grant funding during the winter and summer break periods. Interested students are encouraged to visit the Institute's website for up-to-date information about various grant opportunities and requirements at nanovic.nd.edu.

In addition, the EURO Fellows Program provides an intellectual community for undergraduates committed to research in the Institute, and involves a hands-on research methods course with an immersive fall-break trip to Europe, exclusive access to funding sources for independent and faculty-led research projects, and professional development and community building events.

Irish Studies

Director of Undergraduate Studies:
Tara MacLeod

Interdisciplinary Minor in Irish Studies
Undergraduates in all of Notre Dame's colleges and schools are able to earn an Irish Studies minor.

The requirements are straightforward and conducive to opportunities at the University for study in Ireland:

- Take five full-credit (3-credit or 4-credit) classes cross-listed with Irish Studies. The five classes can be in such departments as Anthropology; English; History; Irish Language and Literature; Political Science; and Film, Television, and Theater.
- Examples of undergraduate courses include Beginning Irish (Gaelic), Gender and Irish Drama, The Black and Green Atlantic, The Making of Modern Ireland, Great Irish Writers, Narrative and Sexuality, Archaeology of Ireland, The Northern Ireland Troubles, Gender and Sexuality in Irish Fiction After Joyce, Sex and Power in Irish Literature: From Warrior Queens to Punk Poets, Popular Song in the 18th Century, Storied Landscapes: From Ireland to Chicago, When Irish Eyes are Smiling: The Irish Comic Tradition, and Irish Culture and Anglicization. The department also offers 1-credit enrichment courses in Irish dance and music.
- In lieu of one of the five courses, students may take a 3-credit independent study with a Keough-Naughton Institute faculty fellow.
- The five classes can be taken on the Notre Dame home campus, the Dublin Global Gateway (O'Connell House), Trinity College (Dublin), the National University of Ireland Dublin, or the National University of Ireland Galway. Study abroad courses not taught by Notre Dame faculty must receive approval to count towards the minor(s).

Note: By taking classes in the Irish (Gaelic) language, you are eligible to apply for summer language grants, dedicated internships and research projects, as well as becoming uniquely prepared for study abroad in Ireland. Most Irish Studies minors take Irish (Gaelic). Irish language classes are therefore strongly encouraged for Irish Studies minors.

COURSE DESCRIPTIONS

All courses associated with the Institute's curriculum can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject European Studies. Additional electives in the Minor in European Studies can be found by selecting MESE from the "Attribute" menu. Course descriptions can be found by clicking on the subject code and course number in the search results.

Peace Studies

Director of Undergraduate Studies:
Ernesto Verdeja
Assistant Director:
Anna Van Overberghe

Peace studies at the University of Notre Dame is centered at the **Kroc Institute for International Peace Studies**. Profiles of the peace studies faculty and information about activities in peace studies can be found on the Kroc Institute's website at kroc.nd.edu.

Program of Studies
Peace studies is an interdisciplinary field of study that draws on diverse academic disciplines to understand the causes of violent conflict; develop nonviolent ways to prevent and resolve war, genocide, terrorism and gross violations of human rights; and build peaceful and just societies.

As a field of study, peace studies links scholarship to practice and empowers students to become effective agents of social and political change at the global, national, and local levels. It develops critical thinking skills, strengthens research and writing ability, teaches specific strategies in areas such as conflict resolution and social change, and challenges students to develop their knowledge into new ways of thinking and acting in the world. Peace studies provides students with the capacity to imagine and build the global community as it ought to be (rather than simply how it is) through interdisciplinary coursework, faculty mentorship, a variety of research and practice opportunities, and an annual student conference.

The Undergraduate Program in Peace Studies offers two curriculum options: the Supplementary Major in Peace Studies (24 credits) and the Interdisciplinary Minor in Peace Studies (15 credits). Both require completion of an introduction course, a mid-level course on peacebuilding, and a capstone research and writing seminar. The remaining coursework consists of electives selected from the program's course catalog. Electives are designated as either core electives or support electives.

The Supplementary Major
The Supplementary Major in Peace Studies requires successful completion of eight (8) courses: the three required courses and five courses selected from a list of approved peace studies electives. At least two of the five electives must be core electives. The curriculum for the supplementary major is:

Required Courses

IIPS 20101 Introduction to Peace Studies	3 cr
IIPS 33101 Perspectives on Peacebuilding	3 cr
IIPS 43101 Peace Studies Senior Seminar	3 cr

Peace Studies Electives

2 IIPS Core Electives	6 cr
3 IIPS Core or Support Electives	9 cr

The Interdisciplinary Minor. The Interdisciplinary Minor in Peace Studies requires successful completion of five (5) courses: the three required courses and two courses selected from a list of approved peace studies electives. The curriculum for the minor is:

Required Courses

IIPS 20101 Introduction to Peace Studies	3 cr
IIPS 33101 Perspectives on Peacebuilding	3 cr
IIPS 43101 Peace Studies Senior Seminar	3 cr

Peace Studies Electives

2 IIPS Core or Support Electives	6 cr

Each required course is a pre-requisite for the next. Required courses may not be taken concurrently, although exceptions can be granted in rare cases. The senior seminar course may 13only be taken during the senior year. Elective courses may be completed at any point, and they may be taken concurrently with required courses.

Because the program takes a minimum of three semesters to complete, students are advised to take Introduction to Peace Studies as early as possible. Courses taken abroad count only as peace studies electives and may not substitute for any of the required courses.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Institute for International Peace Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Social Entrepreneurship and Innovation

Academic Directors:
Michael H. Morris, Melissa Paulsen
Academic Advisor:
Melissa Paulsen

The McKenna Center for Human Development and Global Business coordinates a mix of curricular, research, and community engagement initiatives related to social entrepreneurship and innovation, with a core emphasis on poverty alleviation around the world. Our focus is on the empowering potential of entrepreneurship as a vehicle for addressing social needs and problems in new and different ways. Examples of initiatives in our portfolio include an undergraduate minor, the Global Partnership for Poverty and Entrepreneurship, the Social Entrepreneurship Internship Program, the Mandela Washington Fellowship Program at Notre Dame, the South Bend Entrepreneurship and Adversity Program, the Urban Poverty and Business Initiative, the Experiential Classroom, and a study abroad program in South Africa. In addition, we edit the *Journal of Developmental Entrepreneurship.*

The Minor in Social Entrepreneurship and Innovation
The minor in Social Entrepreneurship and Innovation introduces students to entrepreneurial thinking and innovative problem-solving as both apply to addressing social needs across the globe. Students are introduced to a range of tools, concepts, frameworks, and approaches that help them understand how to develop and implement creative solutions to challenging social problems. The minor consists of fifteen credit hours, including two foundation courses, two electives and a capstone experience. With the electives, students can select from courses offered both within the Keough School and in other disciplines across the campus that address significant social needs such as poverty alleviation, environmental protection, and racial and ethnic inequities. The minor has a strong emphasis on experiential and competency-based learning. A number of co-curricular opportunities are available for students to engage with real-world problems. For more information, please visit our website, sei.nd.edu.

Entrepreneurship Empowerment in South Africa (EESA)
EESA is a six-week study abroad experience where students work with historically disadvantaged entrepreneurs that are based near Cape Town, South Africa. Students earn four credit hours, and gain a life-changing experience where they develop and implement creative solutions to problems and opportunities faced by these entrepreneurs as they try to develop sustainable businesses. Students work in teams that also include South African students. The program is open to graduate and undergraduate

students. All majors are welcome and students do not need to have business experience.

For more complete information about studies in Social Entrepreneurship and Innovation, please consult our website at https://keough.nd.edu/mckenna-center/. Questions about the minor can be directed to Melissa Paulsen at mpaulse1@nd.edu or Dr. Michael Morris at mmorri24@nd.edu.

Officers of the Administration

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Marilyn Keough Dean

CAROLINE HUGHES
Associate Dean for Academic Affairs

ANDRÉS MEJIA ACOSTA
Associate Dean for Policy and Practice

DORY MITROS DURHAM
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Director, McKenna Center for Human Development and Global Business

CLEMENS SEDMAK
Director, Nanovic Institute for European Studies

TRACY KIJEWSKI-CORREA
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TARIQ ANSARI

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NANCY PULTE RICKARD

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GREGORY M. SEBASKY

BRENNAN SMITH

LU SUN

LAURA TAYLOR

BOB ZIELSDORF

College of Science

The University of Notre Dame awarded its first bachelor of science degree in 1865. Before that time, courses had been taught in mathematics (from 1842), in biology (from 1844), and in chemistry (from 1850). In 1867, a program in general science was formulated. Subsequently, specialized programs were added, leading to the degree of bachelor of science in botany and in zoology (both now covered by one degree in biological sciences), in environmental sciences, in biochemistry, in chemistry, in physics, in mathematics, and in preprofessional studies.

Departments of the College of Science

The Department of Applied and Computational Mathematics and Statistics is housed in Crowley Hall, in the academic center of campus. The facilities include office space for faculty members, graduate students and postdoctoral associates, as well as space for these department members to collaborate with undergraduate students in research and educational activities. The department has access to the computing resources of the Center for Research Computing and computing facilities dedicated to department research groups.

The Department of Biological Sciences, located in the Galvin Life Science Center, has well-equipped laboratories for undergraduate and graduate research, spanning the wide realm of the life sciences, across scales of complexity—from cells and organs to whole organisms and ecosystems. The facilities include controlled-environment rooms; an optics facility containing confocal microscopes, scanning and transmission electron microscopes; molecular analysis facilities for DNA sequencing, microarrays, cell sorting; and extensive data storage and retrieval equipment.

The Hank Center for Environmental Science provides more than 20,000 square feet of state-of-the-art research space for aquatic, terrestrial, and environmental studies that includes greenhouses, wet laboratories, and a field sample processing room.

The Freimann Life Science Center provides additional laboratories, vertebrate animal care, and associated specialized modern research facilities to serve the expanding needs of life science research at Notre Dame.

The Jordan Hall of Science contains 16 state-of-the-art biology laboratories for teaching undergraduate and graduate life science laboratory courses. In addition, the collections of museum specimens, including the Greene-Nieuwland Herbarium and the Museum of Biodiversity, are available for research and teaching, housed in superb facilities in Jordan Hall.

The Department of Chemistry and Biochemistry, located in Nieuwland Science Hall, McCourtney Hall, and Stepan Hall of Chemistry and Biochemistry, has laboratories devoted to research in several areas of chemistry: physical, inorganic, organic, and biochemistry. The laboratories are equipped with all necessary facilities for undergraduate students, graduate students, postdoctoral investigators, and faculty. Undergraduate researchers have access to seven high-field NMR spectrometers and three state-of-the-art single crystal X-ray diffractometers, plus many other pieces of equipment such as infrared, ultraviolet, Raman, mass spectrometer; photoelectron spectroscopy; potentiostats; analytical and preparative HPLC and GC equipment; special apparatus for studying mechanisms and rates of reactions; and cell culture facilities. For theoretical work, two large parallel cluster supercomputers are available. The facilities of the Radiation Research Laboratory are used by some faculty of the chemistry department for research in physical chemistry.

The new Jordan Hall of Science houses all of the undergraduate teaching laboratories for chemistry and biochemistry. Included are spacious facilities for introductory and organic chemistry; analytical, physical, and inorganic chemistry; and biochemistry. The building also contains a new NMR spectrometer. Also within Jordan Hall are two large lecture rooms specially designed for teaching introductory science courses, along with a 150-seat multimedia visualization center.

The Department of Mathematics is housed in Hayes-Healy Center/Hurley Hall, conveniently located in central campus. The facilities for undergraduate and graduate instruction and research in mathematics include a first-rate research library; a faculty room; offices for the faculty, postdoctoral investigators, and other visitors, graduate students, and staff; several research seminar and conference rooms; and several large classrooms with state-of-the-art media capability.

The Department of Physics and Astronomy, located in Nieuwland Science Hall, has teaching facilities and laboratories for both undergraduate and graduate research. There are facilities for experimental work in astrophysics, biophysics, condensed-matter physics, elementary particle physics, and nuclear physics. There are three atomic spectroscopy laboratories, and some additional use is made of facilities at Argonne National Laboratory. Elementary particle experiments are done at the Stanford and Fermi national laboratories, and at CERN in Geneva, Switzerland. Detector development for the major accelerators is also being done in the department. The Nuclear Science Laboratory has two accelerators dedicated to nuclear astrophysics. This facility is home to the second largest low-energy nuclear physics program in the country. A variety of solid state facilities are available for the study of metals, high Tc superconductors, and semiconductors. Off-site facilities at Argonne, the National High Magnetic Field Laboratory, and the National Institutes of Standards and Technology are also heavily used. Notre Dame is a partner in the Large Binocular Telescope project. This will be one of the most capable facilities in the world for cutting-edge cosmology and astrophysics research. Research is conducted in many major areas of theoretical physics, including all of the above areas as well as statistical mechanics, field theory, general relativity, and astrophysics. The department has a substantial machine shop and research library and a variety of staff technicians. Many faculty members and research groups have computing facilities, and all have access to the Office of Information Technologies' very large computers.

Jordan Hall of Science houses all of the undergraduate teaching laboratories for physics, including spacious facilities for introductory mechanics, electricity and magnetism, and modern physics. Within Jordan Hall are also a laser and optics lab and an advanced laboratory for physics majors. The building also hosts a rooftop observatory equipped with a dozen small telescopes for introductory astronomy courses, along with a separate dome housing a large, research-quality telescope for physics and astronomy students. Jordan Hall is also home to a 150-seat digital visualization theatre that serves as a planetarium for a variety of astronomy and astrophysics courses.

The Department of Preprofessional Studies is located in the Center for Health Sciences Advising in the Jordan Hall of Science. This center centralizes the advising process for all University students interested in the health professions. All courses for students enrolled in the preprofessional program and collegiate sequence programs are provided by the other departments of the College of Science and the other colleges of the University.

Undergraduate Education

The aim of the program of undergraduate education in the College of Science is to produce intellectually able graduates who are grounded in the broad fundamental principles of the basic sciences, versed in the advanced concepts of their chosen scientific discipline and educated in the humanities and social sciences. Each graduate should be a good scientist in his or her own field; a fully developed person, aware of his or her responsibilities to society and prepared to participate fruitfully in the affairs of society.

Education in science at Notre Dame is a coordinated program involving the basic sciences, the chosen advanced science, and the humanities and social sciences, including theology and philosophy. In this education, the student should acquire a thorough, integrated, and broad understanding of the fundamental knowledge in his or her field, a competence in orderly analytical thinking, and the capacity to communicate ideas to others, orally and in writing. This system of education is so arranged to develop in each student the desire and habit of continuing to learn after graduation, advancing over the years to higher levels of professional and personal stature and keeping abreast of the changing knowledge and problems of his or her profession.

Emphasis is placed on fundamental principles so that the students can develop abilities to apply these principles to the solution of new problems never before encountered by society, to the discovery of new things and to the invention of devices not learned about in books. Notre Dame stresses basic concepts useful in later learning rather than masses of particular facts and data that can better be found in books at the time of need.

Curricula and Degrees

The College of Science offers curricula leading to the degree of bachelor of science in each of six undergraduate departments:

Applied and Computational Mathematics and Statistics
Biological Sciences
Chemistry and Biochemistry
Mathematics
Physics
Preprofessional Studies

The following are degree programs offered by these departments:

Applied and Computational Mathematics and Statistics
Biochemistry
Biochemistry with a concentration in Neuroscience
Biological Sciences
Chemistry
Chemistry combined with Computing
Chemistry with a concentration in Neuroscience
Environmental Sciences
Mathematics
Mathematics (concentration with other programs)
Neuroscience and Behavior
Physics
Physics-in-medicine
Preprofessional Studies
Science-Computing
Science-Education
Statistics

These degree programs are described in detail in later sections of this *Bulletin.*

See also the bachelor of science degree programs offered by the College of Engineering:

Computer Science
Environmental Geosciences

Each College of Science student must enroll in the department of his or her major beginning with the sophomore year; however, a student may change primary majors in the College of Science at any point up until the last drop day of the 7th semester in consultation with their advisor and dean. Concentrations, second and supplementary majors, and minors may be changed at any time; provided, however, that a student's request to change his/her curriculum generally will be denied if the requested change would require the student to remain at the University beyond 8 semesters, or if the proposed plan of study would require a student to carry an overload.

The College of Science maintains a website at science.nd.edu. Further information related to programs offered by the college may be found at that location.

Listed below are the allowed options for students interested in double science majors, double majors between colleges, second majors in the College of Science, and supplementary majors and minors in the College of Arts and Letters.

Students pursuing one of these combination programs must have superior scholastic ability and be formally accepted by the dean of both colleges involved. Approval will not be granted if there is substantial overlap between the two programs.

Note: Courses may only be counted once at each of the following tiers:
1. University and core requirements
2. College and primary major requirements
3. Any other program (second major in another college, supplemental major in another college, or minor), except for courses required by a defined program within the college of science. Additionally, each minor must have 50% or more unique courses.

Double Science Majors. In certain instances, students will have the option of pursuing majors in two departments of the College of Science. Details on the double science major option and lists of combinations that are normally approved are found under "Special Programs," later in this section of the *Bulletin.*

Dual Degree. Notre Dame students pursuing majors in two of the undergraduate colleges may qualify for a five-year dual-degree program.

The requirements for a dual degree generally are as follows: The student completes all of the university requirements, all of the requirements for both colleges, all of the requirements for both majors, and the total number of degree credits specified for a dual degree in the two colleges. While the total number of hours required does depend on the two major programs, the minimum required total number of degree credits is set to be 30 degree credits beyond the college total for the college with the greatest required number of degree credits.

Double Majors in Two Colleges. Qualified Notre Dame students pursuing majors in one of the other undergraduate colleges or schools may add another major in the College of Science. Additionally, qualified Notre Dame students pursuing a major in the College of Science may also add another major in one of the other undergraduate colleges or schools.

The requirements for a double major between colleges generally are as follows: The student completes all the University requirements, the requirements of his or her college or school, and the requirements of both majors. In general, a single course may not satisfy requirements for both majors.

Supplementary Majors and Minors. Qualified Notre Dame students pursuing majors in the College of Science may add a supplementary major or minor. Options include programs offered through the

College of Arts and Letters and the Environmental Geosciences minor offered through the College of Engineering.

Science students may not add the Arts and Letters Preprofessional Studies supplementary major.

Supplementary Majors, Minors, and Concentrations in the College of Science. In the College of Science, the term "second major" is used for a supplementary major. Three departments offer a second major program specifically for students in the other colleges: mathematics as a second major, physics as a second major, and environmental sciences as a second major. The Applied and Computational Mathematics and Statistics department offers supplementary majors for students with a primary major in other departments in the College of Science, as well as other colleges. Likewise, Environmental Science is available as a supplementary major for science students who are not majoring in Biological Sciences, Preprofessional, or one of the Science collegiate sequences (SCCO and SCED). For details, see the departmental sections of this *Bulletin.*

Four departments in the College of Science offer concentration programs: Applied and Computational Mathematics and Statistics, Chemistry and Biochemistry, Mathematics and Physics. For details, see the departmental sections of this *Bulletin*.

Combination Five-Year Program with the Mendoza College of Business. The College of Science and the Mendoza College of Business have established a competitive cooperative program in which a student may simultaneously earn a bachelor of science and a master of business administration degree. The program is structured so that the student who has completed the three years of a science bachelor's degree program, if accepted, completes the master of business administration and the bachelor of science in a major in the College of Science in a summer session and two subsequent academic years.

Students who wish to pursue this program should have a superior scholastic record in their major program and must make application to, and be accepted by, the MBA program.

The general sequence of courses in the five-year Science-MBA program may be found under "Dual Degree Program with the Mendoza College of Business," later in this section of the *Bulletin.*

University and College Requirements

A minimum of 124 credit hours is required for graduation from the College of Science. A minimum of 60 credit hours must be in science; however, each department may specify more than 60 credit hours for any of its programs. A minimum cumulative and major GPA of 2.0 is required for graduation.

All College of Science majors must fulfill University requirements. The specifics of University Requirements are listed in this *Bulletin* on pages 15–18.

Six courses in the liberal arts:

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

Four courses exploring explicitly Catholic dimensions of the liberal arts:

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

Two courses in writing:

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

The two-semester Moreau Program.

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

In addition, all College of Science majors must take courses in:

- Chemistry (10171 and (10172 or 10122) or 10181, 10182)
- Mathematics (10350, 10360 or 10550, 10560 or 10850, 10860)
- Physics (10310, 10320 or 10411, 10424, 20435 or 20210, 20220).

The appropriate sequence for a student depends on the student's major.

The College of Science requires language proficiency through intermediate level. "Intermediate proficiency" is defined differently in each of the languages, depending on the complexity of the language and the intensity of the course. Students may complete the language requirement by either completing a course taught at intermediate level or by demonstrating proficiency through placement examination. The college office maintains a list of language courses at intermediate level. (See the college website, science.nd.edu under Academic Information Frequently Asked Questions.)

Students with no previous background in a language should start with a beginning-level course. They take typically either nine credits over a three-semester period, eleven credits over a three semester sequence, or two semesters of an intensive language sequence (10 credits total). Students with Advanced Placement or SAT II credit may receive up to eight credit hours of language toward their degree. If for some reason more than eight credits appear on the transcript, only eight credits will count toward the required 124 credits. Students who arive with some background in the language they elect, but without AP or SAT II credit, will be placed by departmental examination but will receive no credit hours.

The College of Science will count a maximum of one credit hour from the following types of activity courses:

Band (Marching and Concert)
Orchestra
Chorale
Glee Club
Liturgical Choir
Folk Choir
Music Lessons and Ensembles
Dance
Debate
Science in the Classroom

Additionally, a maximum of twelve credit hours of upper-level (30000- or 40000-level) ROTC courses can be counted toward the 124-credit-hour requirement. These courses will be counted as free electives.

The College of Science works with the Institute for Social Concerns (see page 27 of the *Bulletin)* to develop relevant, community-based opportunities. Science majors may count as general electives up to 3 credits for approved Summer Service Learning Program courses (e.g., THEO 33936) or Social Concerns Seminars (e.g., CSC 33951).

Not all science courses will count toward degree credit or science elective credit for science majors. The survey science courses offered as options for non-science majors for their University science requirement will not count as a science elective or toward the minimum science credit hour requirement. Because of overlap in content with required courses for science majors, many of these courses will also not count toward the degree credit requirement (see "Science Degree Credit," later in this section of the *Bulletin).*

Some major programs have a science elective requirement. For a course to be a science elective, it must meet the following rules: (1) It is offered through one of the departments of the College of Science or through the college itself. (2) It is major's level; that is, other science majors are required to take this course to meet a major requirement or it has a prerequisite course that is offered for science majors, or the *Bulletin* description for the course states that it

is a science elective in the College of Science. Finally, the departments may place additional restrictions on allowed science electives, e.g., for biological sciences major one science elective must be a non-biology course.

All College of Science courses offered by a major program must be taken at the University of Notre Dame. If a student wants to take a course outside Notre Dame for credit toward the Notre Dame degree, prior approval of the dean's office must be obtained. This does not apply to the courses taken by a transfer student prior to attending Notre Dame.

Advising. Notre Dame science majors have been assigned an academic advisor upon matriculation. In some departments, the director of undergraduate studies for the department provides additional major advising. A complete list of names of advisors is kept on the science website.

Notre Dame students who have questions concerning the choice of a major or considering a change of major are urged to make appointments with their academic advisor and the directors of undergraduate studies in the departments involved. Students needing help choosing from similar majors may request an advising appointment with the associate deans of advising or undergraduate studies of the College of Science, 215 Jordan Hall. Any Notre Dame student who is considering a health profession can recieve advising in the Center for Health Sciences Advising in 219 Jordan Hall.

Student Organizations and Activities

In addition to participation in University-wide student activities, the undergraduate students of the College of Science may participate in activities directly related to science, including the undergraduate departmental science organizations: the Biology Club, the Notre Dame Chapter of Student Affiliates of the American Chemical Society, the Mathematics Club, the Society of Physics Students, the Premed Club (preprofessional), the Prevet Club, the Science-Business Club, and the Notre Dame Chapter of Alpha Epsilon Delta (premedical honorary fraternity).

Student Awards and Prizes

The Dean's Award. Presented to a graduating senior in the College of Science in recognition of exemplary academic achievements, leadership, and service to society.

The Dean's Research Award. Presented to a graduating senior in the College of Science in recognition of exceptional research that advances scientific knowledge in their field through publications and presentations.

Outstanding Senior Biological Scientist(s). To the senior(s) who has/have demonstrated the most promise in the biological sciences as evidenced by both academic performance and research participation.

Outstanding Biology Student Leader Award. Seniors nominated for this award must be exemplary student leaders in the Department of Biological Sciences. The student will have made outstanding contributions, through their leadership and service, to advance the interests of other students in the department.

Paul F. Ware, M.D., Excellence in Undergraduate Research Award. The top student nominated for the Outstanding Biological Scientist award will be chosen for the Paul F. Ware award, the highest honor given to a graduating senior in the department. Leadership and/or service in the department, college, or university are also key qualifications for this award.

Outstanding Environmental Scientist Award. Seniors nominated for this award must be exemplary students in the Environmental Science major with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory that emphasizes any aspect of environmental science. The student must have made a significant intellectual contribution to their lab, typically evidenced by a co-authored publication and/or national or regional conference presentation.

Mr. and Mrs. Frank McDonald Undergraduate Research Award. Seniors nominated for this award must be exemplary undergraduate researchers with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory. The student must have made a significant intellectual contribution to their lab, typically evidenced by a co-authored publication and/or national or regional conference presentation.

Mr. and Mrs. Frank McDonald Senior Leader Fellowship. The senior nominated for this award must have devoted substantial time and energy to create sustainable programs or other changes that fundamentally improve the student experience in the Department of Biological Sciences. This academic year fellowship is given periodically to a deserving undergraduate biology major.

Robert Braco, M.D., Honors Research Award. Seniors nominated for this award must be outstanding students in the Biology Honors program with at least 3 semesters (or 2 semesters and 1 summer) of undergraduate research in a Notre Dame faculty laboratory. The student must have made a significant intellectual contribution to their lab, resulting in a co-authored publication and/or a national or regional conference presentation. A successful candidate would also have been exemplary in all honors activities including the honors seminars, the graduate course, and the honors thesis.

Royal Society of Chemistry Certificate of Excellence. For outstanding achievements in chemistry or biochemistry.

Norbert L. Wiech Ph.D. Award. Given to a chemistry or biochemistry major in the junior year for outstanding achievement in academics and research.

Outstanding Biochemist Award. For leadership, academic achievements, research and scholarship in biochemistry.

Outstanding Chemist Award. For academic and research achievements in chemistry as an undergraduate.

William R. Wischerath Outstanding Chemistry Major Award. For academic achievements of a graduating senior chemistry major.

Chemistry-Education Award. For academic achievements in preparation for teaching of chemistry in a secondary education system.

ACS Division of Organic Chemistry Outstanding Senior Organic Chemistry Student. For senior students who have displayed a significant aptitude for organic chemistry in coursework and research accomplishments. Awardees receive a certificate of recognition from the ACS Division of Organic Chemistry.

Chemistry & Biochemistry Leadership Award. For a senior that has devoted substantial time and energy to create sustainable programs or other changes that fundamentally improve the student experience in the Department of Chemistry & Biochemistry.

The General Electric Prizes for Honors Majors in Mathematics. Awarded to senior honors majors in the Department of Mathematics who, in the opinion of the members of the faculty, excelled in mathematics during their undergraduate career.

The General Electric Prizes for Majors in Mathematics. A similar award to senior majors.

The George Kolettis Award in Mathematics. An award established by friends of the late Prof. George Kolettis, for a graduating senior who excelled in mathematics and contributed notably to the esprit de corps of the mathematics student body.

The Aumann Prize for First Year Students in Mathematics. A prize given by Ms. Monika Caradonna in honor of her father, Prof. Georg Aumann, awarded on the basis of a competition among First Year honors mathematics students.

The Norman and Beatrice Haaser Mathematics Scholarships. These scholarships, made possible by the generosity of Professor and Mrs. Haaser, are awarded to worthy, needy students majoring in mathematics.

R. Catesby Taliaferro Competition for Sophomore Mathematics Honors Students. Friends and students of the late Professor Taliaferro established this prize, which is awarded to a sophomore mathematics major on the basis of an essay submitted by the student.

J & C Sophomore Award in Mathematics. Exemplary performance in mathematics classes by a non-honors math major sophomore female or minority (African-American, Asian, Hispanic, Native American) student.

Neuroscience and Behavior Senior Awards for Academic Excellence

Outstanding Undergraduate Research Award. Seniors nominated for this award must be exemplary undergraduate researchers with at least 3 semesters (or 2 semesters and 1 summer) spent in a Notre Dame faculty laboratory. The student must have made a significant intellectual contribution to their lab, typically evidenced by a co-authored publication and/or national or regional conference presentation.

Outstanding Undergraduate Teaching Award. Seniors nominated for this award must have consistently demonstrated excellence in teaching, either through undergraduate teaching assistantships, community education, mentorship, or other direct teaching experience. The student will have demonstrated commitment to teaching excellence through multiple semesters (minimum of 2) of superior teaching performance, as demonstrated by the quality of teaching reviews, faculty or community mentor recommendation.

Outstanding Undergraduate Leadership and Service Award. Seniors nominated for this award must be exemplary student leaders in the Neuroscience and Behavior major and/or the University at large. The student will have made outstanding contributions, through their leadership and service, to advance the interests of other students in the major and/or make significant impact on the larger Notre Dame or South Bend communities.

Universal Scholar Award. Seniors nominated for this award demonstrate remarkable capability across multiple domains (research, teaching, leadership, service), while simultaneously demonstrating the character traits and behaviors that align with the teachings of Catholic Social Tradition: The Common Good, Life and Dignity of Human Persons, Correlation of Rights and Responsibilities, Preferential Option for the Poor, Care for Creation, and Solidarity.

Outstanding Senior Physics Major. This award is given to the outstanding senior physics major, who, in the judgment of the departmental faculty, shows the most promise for a distinguished career in physics. Course grades, the opinion of those who have taught the candidates, and any research performance are considered in making the award.

Paul Chagnon Award. An award to be given to a senior physics major for demonstrated character and leadership and for service to the University, the physiscs department, and to his or her fellow physics majors.

Physics Outstanding Undergraduate Research Award. A monetary award given for excellence in research to an undergraduate physics major.

DiNardo Award. To the outstanding junior preprofessional student.

Emil T. Hofman Scholarships. To six outstanding students pursuing premedical studies.

J.C. Lungren, M.D., Scholarships. Awarded to three outstanding science preprofessional students.

The Lawrence H. Baldinger Award. To seniors in the preprofessional program who excelled in scholarship, leadership, and character.

The Patrick J. Niland, M.D., Award. A monetary award given to a preprofessional studies senior to purchase books for the first year of medical school.

The Samuel Chmell, M.D., Award. To an outstanding senior in preprofessional studies who exemplifies high academic achievement and uncompromising integrity within the program.

The Rev. Joseph L. Walter, C.S.C., Award. To a senior with a keen social awareness who shows great promise as a concerned physician.

Special Opportunities

Glynn Family Honors Program. In the fall of 1983, the University inaugurated an honors program for a small number of outstanding students in the College of Arts and Letters, the College of Science and the School of Architecture. A limited number of students with academic intents for each college are identified at the time of admission. Although selection criteria include the promise of outstanding academic performance as demonstrated by standardized test scores and high school performance, the program is looking for more than mere academic ability. It hopes to identify students with a deep intellectual curiosity and interdisciplinary interests.

The program offers honors sections to fulfill most of the University and college requirements in the students' freshman and sophomore years. For Science majors, these include the yearlong Honors Seminar (satisfying the writing and literature requirements), Honors Philosophy, and Honors Theology. Since these courses are restricted to Glynn honors students, they are smaller than non-honors sections and are usually taught in a seminar format. The teachers for honors sections are chosen from the most outstanding teachers in each college.

After the first year, students' academic work will be centered in their major field of study, but each semester the program offers the opportunity to take elective courses in a variety of subjects. Additionally, honors students take two colloquia focused on senior thesis research during senior year. During the spring of senior year, all students in the Glynn program are required to submit a senior research thesis that reflects at least two semesters' work under the guidance of a faculty advisor. In Science, the research for this project usually begins sophomore year. Because of the generous endowment of the program by John and Barbara Glynn and family, students may apply for available funding for qualified project proposals, including summer research.

In addition to the more narrowly academic features of the honors program, students will be offered various opportunities for broadening personal, cultural, and spiritual growth. Workshops, liturgical events, social gatherings, informal discussions, and cultural excursions are available.

Further information on the structure and content of the Honors Program may be obtained by contacting Prof. Holly Goodson or Prof. Paul Ocobock, 205 O'Shaughnessy Hall, Notre Dame, IN 46556, 574-631-5398.

The Environmental Research Center (UNDERC), a University facility, is composed of approximately 7,500 acres located primarily in the Upper Peninsula of Michigan. Research is conducted at UNDERC by undergraduate as well as graduate students on a variety of environmental problems, including the manipulation of ecosystems. Internships are available to support student participation in BIOS 35502, 35503, and 35504 at UNDERC each summer semester.

Study Abroad. Students from any of the majors in the College of Science may participate in one of the University of Notre Dame's study abroad programs. Science students who go abroad generally do so in one of the two semesters of their junior year. Students applying to medical or dental school during the summer following their junior year (to enter after their senior year) should not study abroad in the spring semester of their junior year. Science students interested in study abroad should discuss their plans with their advisor and with the director of study abroad, Prof. Dana Lashley, 367 Nieuwland Science Hall. Further information can be obtained through Study Abroad, 105 Main Building.

Applied and Computational Mathematics and Statistics

Chair:
Fang Liu
Associate Chair:
Bei Hu
Director of Graduate Studies:
Robert Rosenbaum
Director of Undergraduate Studies:
Alan Huebner
Full Professors:
Jonathan Hauenstein; Bei Hu; Jun Li; Fang Liu; Zhiliang Xu; Yongtao Zhang
Associate Professors:
Martina Bukac; Stefano Castruccio; Alan Lindsay; Robert Rosenbaum; Daniele Schiavazzi
Assistant Professors:
Paola Crippa; Guosheng Fu; Kelsey Gasior; Yuefeng Han; Soham Jana; Tiffany Tang; Giuseppe Vinci; Daren Wang; Xiufan Yu; Changbo Zhu
Full Teaching Professors:
Roya Ghiaseddin; Alan Huebner; Molly Walsh; Roger Woodard
Associate Teaching Professors:
Michael Pruitt; Victoria Woodard
Assistant Teaching Professors:
Catie Acitelli; Christopher Frederick; Shane Leib; Adam Volk

Program of Studies. The partnership of applied mathematics, computational mathematics and statistics brings the tools of modeling, simulation and data analysis to bear on real-world problems, producing solutions with the power to predict and explain complex phenomena. These methods, often applied computationally, are being used in a wide variety of areas in business, engineering, the natural sciences, and the social sciences.

The Department of Applied and Computational Mathematics and Statistics (ACMS) offers programs of study leading to the bachelor of science degree in applied and computational mathematics and statistics and to the bachelor of science in statistics. Computational skills, which are often required to solve real-world problems, will be developed continuously throughout the curriculum. For many students, significant work in an area of application will complement their core studies. Graduates of the program will be well prepared for the following post-graduate opportunities.

- Further training in professional masters or doctoral programs in applied mathematics or statistics;
- Graduate study, at the masters or doctoral level, in bioinformatics or computational biology;
- Employment in technical fields requiring skills in statistics and computation;
- Employment and further study in actuarial science and quantitative methods in business and economics.

In addition to the core bachelor of science in ACMS major, ACMS offers a concentration in biological sciences, which will prepare students for further study or employment in computational biology, bioinformatics, ecological modeling, or epidemiology.

ACMS also offers supplementary majors in applied and computational mathematics and statistics and in statistics. Students in numerous areas of study can benefit from advanced study in applied and computational mathematics and statistics. This is true for students in business and the social sciences as well as those in the natural sciences and engineering. These supplementary majors are well suited for these students.

BACHELOR OF SCIENCE WITH A MAJOR IN APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

The requirements for the degree include courses that develop a strong foundation in the methods of applied mathematics and data analysis, while allowing students to also take courses in a wide variety of application areas. The specific requirements for the bachelor of science in applied and computational mathematics and statistics, beyond the university and college requirements are as follows.

Chemistry (CHEM 10171, 10122 or CHEM 10171, 10172) [1]

Physics (PHYS 10310, 10320) [1]

Applied Calculus I, II (ACMS 10550, 10560) or Calculus I, II (MATH 10550, 10560) [1]

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210 or 20220)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Statistical Methods and Data Analysis I (ACMS 30600)

Mathematical/Comp Modeling (ACMS 40730) or Mathematical/Comp Modeling in Neurosci (ACMS 40740) or Stochastic Modeling (ACMS 40760) or Nonlinear Dynamical Systems (ACMS 40630) or Stochastic Simulation Algorithms (ACMS 40770) [6]

Numerical Analysis (ACMS 40390)

ACMS electives (6 credits in ACMS courses numbered 30000 and above) [2]

MATH or ACMS elective (3 credits in MATH or ACMS courses numbered 30000 or above) [2, 3, 4]

Science elective (3 credits)

These requirements total 43 credits in ACMS and MATH and 61 credits in Science.

Concentration in biological sciences. The required courses for this concentration are as follows.

Introduction to Chemical Principles (CHEM 10171) [1]

Organic Chemistry (CHEM 10172, 20273, 21273)[1]

Physics (PHYS 10310, 10320) [1]

Biology I, II (BIOS 10171, 10172)

Applied Calculus I, II (ACMS 10550, 10560) or Calculus I, II (MATH 10550, 10560) [1]

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210 or 20220)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Statistical Methods and Data Analysis I (ACMS 30600)

Mathematical/Comp Modeling (ACMS 40730) or Mathematical/Comp Modeling in Neurosci (ACMS 40740) or Stochastic Modeling (ACMS 40760) [6]

Numerical Analysis (ACMS 40390)

ACMS electives (6 credits in ACMS courses numbered 30000 and above) [2, 5]

Genetics (BIOS 20303)

Cellular Biology (BIOS 30341) or Ecology (30312)

Biology Elective (3 credits in BIOS which has BIOS 10172 as a prerequisite)

Elective in Biology, Chemistry or Physics (3 credits)

These requirements total 40 credits in ACMS and MATH and 79 credits in Science.

ACMS Sample Curriculum:

First Year

First Semester

ACMS 10550. Applied Calculus I	4
CHEM 10171. Chemical Principles	4
PHYS 10310. General Physics I	4
University Requirement	3
University Requirement	3
Moreau First Year Seminar	1
	19

Second Semester

ACMS 10560. Applied Calculus II	4
CHEM 10172 or 10122	4
PHYS 10320. General Physics II	4
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester

ACMS 20550. Applied Math Methods I	3.5
ACMS 20620. Applied Linear Algebra	3
Language	3
University Requirement	3
Elective	3
	15.5

Second Semester

ACMS 20750. Applied Math Methods II	3.5
Scientific Computing	3.5
ACMS 30530. Introduction to Probability	3
Language	3
University Requirement	3
	16

Junior Year

First Semester

ACMS 30600. Stat. Methods & Data Analysis I	3.5
ACMS 40390. Numerical Analysis	3
Language	3
University Requirement	3
Elective	3
	15.5

Second Semester

ACMS Elective	3
ACMS/MATH Elective	3
University Requirement	3
Science Elective	3
Elective	3
	15

Senior Year

First Semester

Mathematical/Comp Modeling (ACMS 40730) or Mathematical/Comp Modeling in Neurosci (ACMS 40740) or Stochastic Modeling (ACMS 40760) or Nonlinear Dynamical Systems (ACMS 40630) [6]	3
ACMS Elective	3
Elective	9
	15

Second Semester

ACMS Elective	3
Electives	9
	12

ACMS/BIOS Sample Curriculum:

First Year

First Semester

ACMS 10550. Applied Calculus I	4
CHEM 10171. Chemical Principles	4
BIOS 10171. Biology I: Big Questions	4
University Requirement	3
University Requirement	3
Moreau First Year Seminar	1
	19

Second Semester

ACMS 10560. Applied Calculus II	4
CHEM 10172	4
BIOS 10172. Biology II	4
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester

ACMS 20550. Applied Math Methods I	3.5
ACMS 20620. Applied Linear Algebra	3
CHEM 20273/21273	4
Language	3
University Requirement	3
	16.5

Second Semester

ACMS 20750. Applied Math Methods II	3.5
Scientific Computing	3.5
ACMS 30530. Introduction to Probability	3
Language	3
University Requirement	3
	16

Junior Year

First Semester

ACMS 30600. Stat. Methods & Data Analysis I	3.5
PHYS 10310. General Physics I	4
BIOS 30341 or 30312	3
Language	3
University Requirement	3
	16.5

Second Semester

BIOS 20303. Genetics	3
PHYS 10320. General Physics II	4
Biology/Chemistry/Physics Elective	3
University Requirement	3
Elective	3
	16

Senior Year

First Semester

ACMS 40390. Numerical Analysis	3
Mathematical/Comp Modeling	3
Biology Elective	3
ACMS Elective	3
Elective	3
	15

Second Semester

ACMS Elective	3
ACMS Elective	3
Electives	6
Moreau Senior Capstone	1
	13

Notes:

1. Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.

2. Some ACMS courses, ACMS 30440 in particular, are not acceptable as electives for the major. The list of acceptable courses for ACMS majors can be obtained from the student's advisor.

3. Introduction to Mathematical Reasoning (MATH 20630) is also an acceptable ACMS/MATH elective.

4. Students with an interest in attending graduate school in mathematics or applied mathematics are encouraged to take Algebra (MATH 30710) and Functional Analysis (ACMS 50550).

5. An appropriate class in bioinformatics, biophysics, or a related topic, may be substituted for 3 credits in ACMS coursework with the permission of the Director of Undergraduate Studies.

6. One of the courses satisfies the modeling course requirement. If more than one course is taken, the other can be counted as an ACMS elective.

CONCENTRATION IN SCIENTIFIC COMPUTING

The concentration in scientific computing will prepare students for further study or employment in computational engineering, computational mathematics, and computer science. The required courses for this concentration are as follows:

- 3 credits from Second Course in Scientific Computing (ACMS 40210 Scientific Programming or ACMS 40212 Advanced Scientific Computing)
- 6 credits arising from additional electives chosen from either Second Course in Scientific Computing, Foundational Methods, Computing and Modeling, or Additional Electives lists found here: https://acms.nd.edu/undergraduate/degrees/concentration-in-scientific-computing/

BACHELOR OF SCIENCE WITH A MAJOR IN STATISTICS

The requirements for the degree include courses that develop a strong foundation in the methods of applied mathematics and data analysis, while allowing students to also take courses in a wide variety of application areas. The specific requirements for the bachelor of science in statistics, beyond the university and college requirements are as follows.

Chemistry (CHEM 10171, 10122 or CHEM 10171, 10172) [1]

Physics (PHYS 10310, 10320) [1]

Applied Calculus I, II (ACMS 10550, 10560) or Calculus I, II (MATH 10550, 10560) [1]

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210 or 20220)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Statistical Methods and Data Analysis I (ACMS 30600)

Mathematical Statistics (ACMS 30550)

ACMS statistics electives (9 credits in ACMS statistics courses chosen from a list of approved courses)[2]

MATH or ACMS elective (3 credits in MATH or ACMS courses numbered 30000 or above) [3]

Science elective (3 credits)

These requirements total 43 credits in ACMS and MATH and 61 credits in Science.

Statistics Sample Curriculum:

First Year

First Semester	
ACMS 10550. Applied Calculus I	4
CHEM 10171. Chemical Principles	4
PHYS 10310. General Physics I	4
University Requirement	3
University Requirement	3
Moreau First Year Seminar	1
	19

Second Semester	
ACMS 10560. Applied Calculus II	4
CHEM 10172 or 10122	4
PHYS 10320. General Physics II	4
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester	
ACMS 20550. Applied Math Methods I	3.5
ACMS 20620. Applied Linear Algebra	3
Language	3
University Requirement	3
Elective	3
	15.5

Second Semester	
ACMS 20750. Applied Math Methods II	3.5
Scientific Computing	3.5
ACMS 30530 Intro Probability	3
Language	3
University Requirement	3
Elective	3
	19

Junior Year

First Semester	
ACMS 30600. Stat. Mthds Data Anal.	3.5
ACMS/MATH Elective	3
Language	3
University Requirement	3
Elective	3
	15.5

Second Semester	
ACMS 30550. Mathematical Statistics	3
ACMS Statistics Elective	3
University Requirement	3
Science Elective	3
Elective	3
	15

Senior Year

First Semester	
ACMS Statistics Elective	3
Science Elective	3
Elective	9
	15

Second Semester	
ACMS Statistics Elective	3
Electives	9
Moreau Senior Capstone	1
	13

Notes:

1. Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.

2. The acceptable elective courses are:
- *a. ACMS 30810 Design of Experiments*
- *b. ACMS 40842 Time Series Analysis*
- *c. ACMS 40852 Advanced Biostatistical Methods*
- *d. ACMS 40855 Spatio-Temporal Statistics*
- *e. ACMS 40875 Statistical Methods in Data Mining*
- *f. ACMS 40878 Statistical Computing with R*
- *g. ACMS 40950 Topics in Statistics*
- *h. Any graduate ACMS course in statistics or probability*

3. Introduction to Mathematical Reasoning (MATH 20630) is also an acceptable elective.

4. A student should take three core requirement courses during the first year, including one course that is designated a University Seminar. It is recommended that one course in history or social sciences be taken in the first year and one philosophy and one theology be taken by the end of sophomore year.

SUPPLEMENTARY MAJOR IN STATISTICS

The supplementary major in statistics requires 37 credits in ACMS and Mathematics. The specific requirements are as follows.

Calculus I, II (MATH 10550, 10560)

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210 or 20220)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Mathematical Statistics (ACMS 30550)

Statistical Methods and Data Analysis (ACMS 30600)

ACMS Statistics electives (6 credits)

Difference from the full major. The full Statistics major requires 43 credits in ACMS and MATH courses. This supplementary major requires one fewer statistics elective and one fewer ACMS elective.

Double counting issues. A student is permitted to double count Calculus I and II for a first major and this supplementary major. A student whose first major requires Calculus III and Ordinary Differential Equations is exempt from ACMS 20550 and 20750, but must complete an additional 6 credits of electives in ACMS. The same principle applies to any other courses required by a first major and this program.

SUPPLEMENTARY MAJOR IN APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

The supplementary major in applied and computational mathematics and statistics requires 37 credits in ACMS and Mathematics. The specific requirements are as follows.

Calculus I, II (MATH 10550, 10560)

Introduction to Applied Mathematical Methods I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210 or 20220)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Statistical Methods and Data Analysis I (ACMS 30600)

Mathematical/Comp Modeling (ACMS 40730)
or Mathematical/Comp Modeling in Neurosci (ACMS 40740)
or Nonlinear Dynamical Systems (ACMS 40630)
or Stochastic Modeling (ACMS 40760)
or Stochastic Simulation Algorithms (ACMS 40770) [1]

Numerical Analysis (ACMS 40390)

ACMS electives (3 credits in ACMS courses numbered 30000 and above, except those overlapping in content with one of the above)

1. One of the courses satisfies the modeling course requirement. If more than one course is taken, the other can be counted as an ACMS elective.

HONORS IN ACMS

Junior majors in ACMS may apply for the departmental honors program to receive the designation "Honors in Applied and Computational Mathematics and Statistics".

Here are the requirements:
- A minimum of Cum GPA of 3.5.
- Complete a minimum of two semesters in undergraduate research ACMS 48498 during the junior or senior year, potentially including a summer semester.
- Complete an undergraduate thesis, ACMS 48500.
- Presentation of the thesis in a seminar or a conference, on campus or outside campus.

Before the end of the junior year, students interested in the Honors option must apply to the director for undergraduate studies, who will make suggestions to students for an appropriate advisor. The subject matter should be in an area of expertise of at least one member of the department. The student will work with the advisor to complete a thesis, which must be signed off by the advisor and then submitted to the Director of Undergraduate Studies by April 15 of the senior year. If approved, the student will receive credit for ACMS 48500, Undergraduate Thesis.

The undergraduate thesis must go beyond what is found in an undergraduate course, and present a novel approach to a subject.

MINOR IN SCIENTIFIC COMPUTING

This 15-credit minor will provide students with (i) a solid programming background for running computer simulations, (ii) a computing and modeling course for learning how to develop mathematical models, (iii) a foundational methods course for learning how to analyze the stability and accuracy of computer simulations, and (iv) an elective course to explore additional topics or applications of scientific computing. The required courses for this minor are as follows:

- 3 credits from First Course in Scientific Computing (ACMS 20210* or 20220* or CBE 20258 or CSE 20311* or PHYS 20420) (Note: the "*" denotes that the course lab component must be taken concurrently.)
- 3 credits from Second Course in Scientific Computing (ACMS 40210 or 40212)
- 3 credits from Foundational Methods list
- 3 credits from Computing and Modeling list
- 3 credits arising from an additional elective chosen from either Second Course in Scientific Computing, Foundational Methods, Computing and Modeling, or Additional Electives lists

The acceptable courses for Foundational Methods, Computing and Modeling, and Additional Electives are found here: https://acms.nd.edu/undergraduate/degrees/minor-in-scientific-computing/

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Applied & Computational Mathematics and Statistics.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Biological Sciences

Chair:
Jason Rohr
Director of Graduate Studies:
David Medvigy
Director of Undergraduate Studies, Biological Sciences:
Jennifer Robichaud
Director of Undergraduate Studies, Environmental Sciences:
Dominic Chaloner
Professors:
Elizabeth Archie; Sunny Boyd; Patricia Champion; Alvaro Acosta Serrano; Crislyn D'Souza-Schorey; Jeffrey Feder; Michael Ferdig; Kasturi Haldar; David Hyde; Mary Ann McDowell; Bernard Nahlen; T. Alex Perkins; Michael Pfrender; Jason Rohr; Jeffrey Schorey; Nathan Swenson; Jennifer Tank
Associate Professors:
Giles Duffield; Ana Flores-Mireles; Hope Hollocher; Xin Lu; Jason McLachlan; David Medvigy; Adrian Rocha; Pilar Pérez Romero; Zachary Schafer; Cody Smith; Kevin Vaughan; Rebecca Wingert
Assistant Professors:
Katrina Adams; Tyler Coverdale; Cristian Koepfli; Jianneng Li; Christopher Patzke; Felipe Santiago-Tirado; Julian Torres-Dowdall
Professors Emeriti:
Gary Belovsky; Nora Besansky; John Duman; Malcolm Fraser; Paul Grimstad; Barbara Hellenthal; Ronald Hellenthal; Gary Lamberti; David Lodge; T. Mark Olsen; Joseph O'Tousa; Jeanne Romero-Severson; David Severson; Kristin Shrader-Frechette
Teaching Faculty:
Trenton Agrelius; Diane Lane; Kristin Lewis; Nancy Michael; Jennifer Robichaud; Benjamin Rudenga; David Veselik; Michelle Whaley
Professors of the Practice:
Dominic Chaloner; Joanna Larson; Xuemin (Sheryl) Lu; Michael McConnell; Bharat Mishra; Ryan Sensenig; Amy Stark; Patricia Vaughan
Research Faculty:
Nicole Achee; John Grieco; Lee Rafuse Haines; Anita Lerch; Neil Lobo; Daniela Miranda; Angana Mukherjee; Prasad Padmanabhan

Program of Studies. The Department of Biological Sciences offers programs of study leading to the degrees of bachelor of science with a major in biological sciences or bachelor of science with a major in environmental sciences, master of science in biological sciences and doctor of philosophy. Also offered is a second major in environmental sciences for students in the Colleges of Arts and Letters, Business Administration or Science.

Program in Biological Sciences. The Department of Biological Sciences at Notre Dame is committed to understanding the fundamental mechanisms by which living systems operate. The Department is highly interdisciplinary and in excellent position to fulfill the promise of the new integrative approach to biology. Basic research is at the center of our endeavors and fuels and inspires our teaching and training. We seek solutions to human health and environmental crises facing our society—such as finding treatments, cures and preventions for human diseases, maintaining biodiversity on land and in our natural water sources, ensuring an adequate supply of food and fresh water, and reversing the effects of pollution and climate change.

Research in the department spans the wide realm of the life sciences, across scales of complexity—from cells and organs to whole organisms and ecosystems—and across foci as varied as infectious disease, cancer, organ regeneration, climate change and biodiversity. *United through the ultimate goals of fostering human and environmental health,* we believe that real-world solutions require integrative biological inquiry and multidisciplinary collaboration. Our department serves as a hub connecting different academic units across campus and different universities worldwide, through life science-related investigation and problem solving.

Students choosing an undergraduate major in biological sciences will be prepared for graduate study (M.S., Ph.D., MD/Ph.D.) leading to a research career, or for admission to medical, veterinary, and other professional schools. Graduates with a bachelor's degree may enter careers in industry, government, or health-related research laboratories. Those who wish to teach at the elementary or secondary level should be sure to include required education courses such as those offered through Saint Mary's College.

Policy Statement on the Use of Organisms in Biological Sciences Teaching Laboratories. Some laboratory courses offered by the Department of Biological Sciences may involve the use of living or preserved organisms. Instructors use these animal specimens in cases where this is deemed necessary for teaching important biological concepts and principles. *Students who have concerns about the use of organisms in classes must, prior to registering, submit a request for alternate materials to the course instructor.* It is up to the discretion of the instructor(s) as to whether and how non-organism alternatives may be substituted for biological materials in classes. *Students permitted to use alternate materials are responsible for the same knowledge and application as their classmates and may be required to complete examinations that involve the inspection or handling of biological specimens.*

Biology Courses. The biology courses included in this Bulletin are those reasonably expected to be offered several times to every semester during the next four years. However, changes may occur as faculty add new courses or drop those with little demand. Courses without laboratories are indicated as lecture only.

The requirements in biological sciences include courses from a basic five-core sequence, laboratory

courses and sufficient numbers of BIOS electives to complete the 41-credit-hour requirement. ***All majors are strongly encouraged to complete the sequence Biological Sciences I and II (BIOS 10171–10172) in their first year*** to ensure the completion of all requirements in four years. Students wishing to change majors into the biological sciences should have completed the introductory biology sequence to ensure interest and the completion of all their requirements in four years without overloading. Otherwise, students may be at a considerable disadvantage in scheduling requirements. Students would have one year less to explore their interests in biology.

BACHELOR OF SCIENCE WITH A MAJOR IN BIOLOGICAL SCIENCES

Director of Undergraduate Studies:
Jennifer Robichaud

The biological sciences majors take the following basic sequence of courses in the College of Science:

General Chemistry (CHEM 10171 and 20274)
Organic Chemistry (CHEM 10172 and 20273)
Physics (PHYS 20210–20220)
Calculus (MATH 10350–10360 or 10550–10560)

There are six components to the biology core requirement, consisting of courses in the following areas:

Core I: Introductory Biology Sequence
Biology I: Big Questions (BIOS 10171)
Biological Investigations Laboratory (BIOS 11173)*
Biology II: Molecules to Ecosystems (BIOS 10172)
Research Experience in Biology Laboratory (BIOS 11174)*

**These labs are designated lab #1 and lab #2 of the five required for the major.*

Core II: Genetics (3–4 credits)

Core III: Evolution (3 credits)

Core IV: Cell Biology and Physiology (3 credits)

Core V: Ecology and the Environment (3 credits)

Core VI: Laboratory Courses

Students complete five laboratory courses (BIOS 11173, BIOS 11174, and 3 additional labs). Three semesters of undergraduate research can fulfill one of five laboratory courses.

Note that select overseas courses that have been approved for science credit may satisfy the Core II through VI requirement if approved by the Director of Undergraduate Studies in Biological Sciences before taking the class.

SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ANY BIOLOGICAL SCIENCES MAJOR

		Year Usual Credits Taken
Biological Sciences*	**41**	**all**
Chemistry (10171–10172 or 10181–10182)	**8**	**First year**
	8	**Sophomore**
Physics (20210–20220 with labs)	**8**	**Junior**
Mathematics (10350–10360 or 10550–10560)	**8**	**First year**
Total Science:	**73**	
Liberal Arts 4–6	**9**	**First year**
Philosophy**	**6**	
Theology**	**6**	
WR 13100	**3**	**First year**
Language	**Intermediate Level Competency (3)**	
Free Electives	**24+**	**Sophomore/Senior**
Moreau Program	**2**	**First & Final year**
	124 credits	

*** It is essential for prospective biology majors to begin their general biology courses in the first year to schedule all required core curriculum courses within a four-year period.**

**** One of these courses must be a University Seminar.**

+ Minimum number of free electives based on the assumption that intermediate-level competency in language was achieved by taking a minimum of one three-credit course.

Majors often have time to incorporate 20 or more free elective credits (i.e., a second major or minor) into their four-year course selection.

Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

CONCENTRATIONS

The Department of Biological Sciences offers eight concentrations within the Biological Sciences major. Concentrations provide structure to elective selection to assist students' development in their fields of interest, and provide experience in a field within biology for students seeking admission to graduate school, medical school, or other programs/jobs.

Each concentration requires a minimum 14 credits with 5 credits allowed to "double-count" and 9 Biology electives unique to the concentration. These credits are in addition to the 73 total science credits required off the Biological Sciences major listed above.

Concentrations include:

- Biomedical Sciences
- Cell and Developmental Biology
- Computational Biology
- Ecology and Environment
- Evolution and Genomics
- Infectious Disease and Global Health
- Medical Neurobiology
- Integrative Biology

For full descriptions of each concentration, see https://biology.nd.edu/undergraduate/programs-of-study/biology-major.

BIOS ELECTIVES

The minimum required credits in the core including labs is 23. An additional 18 credits of electives in biological sciences are chosen to complete the required total of 41 credits.[4-7] All biological sciences majors are encouraged to include non-science among their free electives.

Notes:
1. Students are required to take a total of five laboratories; two of the five labs will be part of Core I, and the remaining three of the five laboratories are chosen among the Core II through Core V and/or BIOS electives, including 50000- and 60000-level courses. Thus, there are two required "named" BIOS labs and three additional elective BIOS labs. Students who conduct a minimum of three semesters of undergraduate research (BIOS 48498) in a laboratory or research group at Notre Dame and earn a minimum of 3 credits (i.e., 3 x 1.0 credit), may substitute those research semesters for one of the five required labs.

2. Select non-BIOS major-level College of Science courses (i.e., those taken to meet science-major requirements and not among those designated as "Recommended University electives") that are not being used to fulfill other specific graduation requirements can be chosen with the consent of the director of undergraduate studies for the Department of Biological Sciences and counted toward the BIOS elective credits. While majors are allowed to take one 3-credit, non-BIOS lecture course and have that count toward the 41 required credits, students may also include one non-BIOS lab if it is required for that non-BIOS lecture and have that laboratory satisfy one of the six required laboratories. For example, Physical Geology (SC 20110, ENVG 10110/20110) has a required laboratory, and majors who choose BIOS electives based on their environmental or ecological interests may elect to take Physical Geology for a total of 4 credits toward the 41 required credits. Majors who might have transferred into BIOS from BCHM and had taken the required biochemistry (CHEM 30341) lecture and laboratory course will be allowed to count both the lecture and laboratory toward the 41 credits. The same would be true of other relevant science courses (e.g., analytical chemistry, physical chemistry) as approved by the director of their major and the associate dean of the College of Science.

3. Undergraduate Research (BIOS 48498) and Directed Readings (BIOS 46497) count toward the 41-credit biological sciences requirement; however, only a maximum of two credits per semester per course and a combined total of six credits from these two courses may be counted in fulfilling the 41-credit requirement. A maximum of two credits of BIOS 37495 (Teaching Practicum) may be included in any combination of these six credits. A maximum of only nine credits in these courses may be used toward graduation; however, additional credits do remain on a student's permanent transcript record.

Sample Curriculum: The sample curriculum for the four-year program listed below is only one of a number of ways a student can complete all the requirements for a biology major. Students should discuss their specific interests with their departmental advisor and plan their semesters accordingly. Alternative sample curricula can be developed with the assistance of the biology advisor.

Note that this sample curriculum assumes that no language CE credits are included.

First Year

First Semester

Biology I lecture and lab	4
Calculus I (or A)	4
General Chemistry I lecture and lab [1]	4
Theology or Philosophy [2]	3
Writing Requirement	3
Moreau First Year Seminar	1
	19

Second Semester

Biology II lecture and lab	4
Calculus II (or B)	4
Organic Chemistry I lecture and lab [1]	4
Theology or Philosophy	3
Writing Requirement	3
	18

Sophomore Year

First Semester

BIOS Core (II, III, IV or V)	3-4
BIOS Elective lab	1-2
Organic Chemistry II lecture and lab	4
Theology or Philosophy	3
Language I	4
	15–17

Second Semester

BIOS Core (II, III, IV or V)	3
BIOS Core (II, III, IV or V)	3
General Chemistry II lecture and lab	4
Theology or Philosophy	3
Language II	3
	16

Junior Year

First Semester

BIOS Core (II, III, IV or V)	3-4
BIOS Elective Lab	1-2
Physics I lecture and lab	4
Ways of Knowing IV [4]	3
Language III	3
	14–16

Second Semester

BIOS Elective [3]	3
BIOS Elective	3
Physics II lecture and lab	4
Ways of Knowing V	3
Free Elective	3
	16

Senior Year

First Semester

BIOS Elective	3
BIOS Elective	3
BIOS Elective lab	1–2
Ways of Knowing VI	3
Free Elective	3
	13–14

Second Semester

BIOS Elective	3
BIOS Elective	3
BIOS or Free Elective	3
Free Elective	3
Moreau Senior Capstone	1
	13

Need a minimum total of 124 credits.

1 Students who begin with the CHEM 10181–10182 sequence and select BIOS as their major would complete the four-semester sequence with CHEM 20273–20274.

2 One of these courses must be a University seminar.

3 While not required, many students choose to take a supporting 3-credit non-BIOS science course that counts toward the required 41 credits in their major.

4 For premedical students, it is strongly recommended that the student take a 20000-level English literature course. This ensures that the student will be able to meet the standard medical-school admission requirement of two English courses. Medical ethics and biochemistry are also generally required or highly recommended.

Students majoring in biological sciences please note: the biology survey courses (10101–10119) *satisfy the science requirement for* ***non-science majors*** *at Notre Dame.* They do not satisfy the science requirements for science majors at Notre Dame or elsewhere. Students may not take courses with overlapping or similar lecture material such as BIOS 10101 and 10110 or BIOS 10107, 10118, and 10119, for example. A table listing these overlapping courses is on the final pages of the College of Science section of this *Bulletin*.

Also, Biostatistics (BIOS 40411/42411) is highly recommended for all students planning on a health related professional program or a graduate program, especially in ecology, environmental biology, or other field of life science. A non-BIOS/Science elective can be any 30000–50000-level course other than those required, and approved by the director of undergraduate studies for the Department of Biological Sciences. Biochemistry (e.g., CHEM 40420) is especially recommended.

In addition to the undergraduate curriculum, the Department of Biological Sciences offers programs of graduate study leading to the degrees of master of science and doctor of philosophy, as described in the *Graduate School Bulletin of Information.*

SELECT GRADUATE-LEVEL COURSES

Many 60000-level courses in biological sciences are open to qualified undergraduates, subject to the approval of the course instructors and the director of undergraduate studies. Graduate-level courses generally include a majority of upper-class students and are recommended to undergraduate majors.

The above 60000-level courses are described in the *Graduate School Bulletin of Information.*

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- ***Biological Sciences***
- ***Sustainability***

Course descriptions can be found by clicking on the subject code and course number in the search results.

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MINOR IN BIOLOGICAL SCIENCES'

Program Overview: The minor in biological sciences requires a minimum of 18 credits of study in the biological sciences. To enter the Biological Sciences sequence, students must have completed the two-semester sequence of Introductory Biology (BIOS 10171/11173 and BIOS 10172/11174).

Program Restrictions:

- Following the College of Science policy, at least 50% of the courses for the minor must be unique (not double counted at the major, college, or university level).
- All courses for the minor must be taken at Notre Dame or through a Notre Dame-approved study abroad program.
- Students must also maintain a 2.50 minimum GPA in their minor courses.
- The following majors will be unable to take the minor in Biological Sciences: all majors in the College of Sciences, Neuroscience and Behavior and Arts and Letters Pre-Health majors in the College of Arts and Letters.

Additional Coursework:
Students must take at least one course in **two** of the four core Biological Science disciplines: Genetics, Evolution, Cell Biology & Physiology, and Ecology & Environment. In addition, they must take **one** BIOS elective at the 30000 or 40000 level. Completion of two courses provides the student an opportunity to begin focusing within the breadth of biology and prepares them for 3/4000-level biology electives relevant to their interests. Alternatively, students with a broad interest in biology may complete an additional core course to satisfy the upper-level elective requirement. This flexibility encourages students to develop a curriculum suited to their interests and career goals. Students are also required to enroll in **one** additional credit of laboratory course. A combination of upper-division biological science laboratory courses and seminars can be considered for a replacement of up to three credits of the required additional coursework with departmental pre-approval.

Core I: Genetics
BIOS 20250 or 20303

Core II: Evolution
BIOS 30305 or 30310

Core III: Cell Biology & Physiology
BIOS 20241 or 30341, 20450, 30410, 30344

Core IV: Ecology & Environment
BIOS 30312, 30420, 30413

Elective Courses in BIOS
Any 3-credit BIOS 30000/40000 level course

Laboratory Courses
BIOS 21250 or 21303, 31312, 31341, 31401, 31408, 31420, 41340, 41415, 41425

BIOLOGICAL SCIENCES HONORS PROGRAM

The goal of the honors program is to give interested students an exceptional experience in biological research. Participation in this program will increase their level of commitment and productivity while preparing them for successful postgraduate careers.

Biological and Environmental Sciences majors are encouraged to identify a research mentor and project during their sophomore year, but final applications into the program should be completed during the fall of their junior year. Acceptance by the Undergraduate Research Committee will be based on minimum 3.0 Science GPA at time of application, cover letter, research statement, unofficial transcript, and nomination form from research mentor.

To graduate with honors, students should complete all of the requirements for their major and:

1. Maintain a minimum 3.0 Science GPA or higher throughout the program.
2. Have a minimum of three semesters of biological science research experience in the research mentors lab.
3. Generate original data in order to complete and write a thesis.
4. Complete a two to three credit graduate level course in the area of research.
5. A presentation at a national or regional meeting.
6. One disciplinary research seminar in Junior year, Spring semester (1 credit seminar).

Thesis Requirements:
Over the course of the program, students will write a draft of their thesis under the guidance of the research mentor and advising mentor. The final draft of the thesis will be submitted by April 15. The thesis will be reviewed by the student's research mentor and advising mentor. If the thesis is not approved, a member of the Undergraduate Research Committee will read the thesis and confer with the mentors for a final decision. Guidelines for the thesis and thesis reviewers will be provided.

Research Seminar (Graded):
The purpose of these seminars is to create a small learning community of students interested in research. The seminar learning goals are to support and develop each student's independence, scientific communication skills, critical review skills, and understanding of their research in the context of the larger field.

UNDERC FIELD BIOLOGY PROGRAMS

Three-credit programs for undergraduates that emphasize field biology are offered at the University of Notre Dame Environmental Research Center on the Upper Peninsula of Michigan. The programs entail course work, group research projects, or an independent research project. Application to the programs occurs in the fall of the sophomore and junior years and enrollment is limited by housing at each location. If selected, students enroll in BIOS 35501 during the spring semester and BIOS 35502 during the summer. To participate in other programs (BIOS 35504, 35505), one must first complete BIOS 35502 or have similar research experience.

ENVIRONMENTAL SCIENCES

Director of Undergraduate Studies:
Dominic Chaloner

Program in Environmental Sciences. All life, including humans, directly depends on the functioning of Earth's ecosystems. Further, it has become apparent that human activities have altered Earth's environments. Factors such as pollution, invasive species introductions, anti-biotic resistance, and global climate change can all be traced to human activity. Increasing the knowledge and awareness of the link between humans and the environment is one of the most important endeavors of the twenty-first century.

The environmental sciences major stresses interdisciplinary knowledge and logic. The curriculum is designed to expose students to a scientific understanding of our environment from biological, chemical, and physical perspectives. Particular emphasis is placed on understanding how humans interact chemically and biologically with the environment. Material and energy resource limitations, chemical and thermal pollution, and effects of environmental pollution on public health are major considerations within the environmental sciences curriculum. Emphasis is also placed on understanding interactions between human societies and the environment from social, ethical, economic, anthropological, and governmental points of view. Students are also encouraged to strengthen their mathematical and computational skills and to participate voluntarily in environmentally oriented research projects or summer internships.

Concentrations in Earth Science. With this collaboration students will explore how geologic processes affect humans and how human activity is changing earth systems, studying a range of topics including earthquakes, volcanic activity, global climate change, subsurface transport of toxic heavy metals, carbon sequestration, and safe disposal of nuclear waste. The Earth Science concentration program combines classroom, laboratory and field studies, and all students are encouraged to conduct independent research under faculty supervision. The flexibility of the undergraduate program allows students to switch to this concentration if they have followed either an engineering or science track during their first or even their second years.

An undergraduate major in Environmental Sciences with a concentration in Earth Science prepares a student for graduate study (M.S., Ph.D.) in many aspects of geological and environmental science, as well as for admission to a variety of professions. Graduates with a B.S. degree may enter careers in diverse areas such as state geological offices, the National Park Service, oil and mining industries, environmental consulting, and government national

research laboratories or policy offices. Another option is the minor in environmental Earth sciences which requires only 14 credits. The minor provides a foundation in the physical, chemical, and biological processes at Earth's surface, and how they are influenced by human activities. For more information see page 128.

The First Major. College of Science students who major in Environmental Sciences will earn the degree of bachelor of science. Students following the Environmental Sciences first major program complete a total of 69 credits of science.

The Second Major. Most students in the College of Arts and Letters or in the Mendoza College of Business may participate in the Environmental Sciences Program as a second major. Students in the College of Science may also pursue Environmental Sciences as a second major unless it is prohibited by their first major. Second majors are required to complete a minimum of 37 credits of science. Students considering this program should investigate options brought to a first major by adding course work in environmental sciences. For example, students majoring in government and in environmental sciences could consider postgraduate study or careers in *public policy.* Students majoring in economics and in environmental sciences would have a good background for the developing field of *environmental economics.* A second major in Environmental Sciences also complements majors in the other sociological fields of anthropology, psychology, or sociology. Similarly, business students will likely find environmental sciences to be useful background when working with local or federal governments on issues of *environmental compliance* or when considering the impact of business decisions on the environment *(environmental assessment).* All students are urged to discuss their long-range career plans with advisors in both majors.

Relationship with Other Programs: The Environmental Sciences Major Program has a special collaborative relationship with the Science, Technology, and Values (STV) Concentration program housed in the Reilly Center in O'Shaughnessy Hall. Select courses required of environmental sciences first majors are also cross-listed as STV courses. Thus, students in the STV program from across the university are expected to benefit in the curricular endeavors of the Environmental Sciences Program. Environmental sciences first majors often enroll in the STV program. (Environmental science students with flexibility in their program often have room to complete an STV concentration by taking STV courses beyond those required by the first major or university requirements.) However, arts and letters students with second majors in environmental science will be encouraged to participate in further interdisciplinary course work through the STV concentration. Second majors are especially encouraged to take the capstone course, BIOS 40491, Current Topics in Environmental Science, *provided* it completes that second program.

BACHELOR OF SCIENCE WITH A MAJOR IN ENVIRONMENTAL SCIENCES

Environmental Sciences majors may pursue a supplementary major within or outside the College of Science so long as this is permitted by the program, and with the permission of the director and the dean or dean's designate.

All environmental sciences first majors take the following courses in science:

Introductory Biology (BIOS 10171–10172 and 11173–11174)

Chemistry (CHEM 10171 and 10172)

Calculus (MATH 10350–10360) [1, 2, 3]

Planet Earth (SC 20110/21110)

Physics (PHYS 20210–20220)

Biostatistics (BIOS 40411) [4]

General Ecology (BIOS 30312)

Practical Ecology Laboratory (BIOS 31312)

Chemistry Elective [5]

Current Topics in Environmental Science (BIOS 40491)

Students also will choose science electives chosen from an approved list,[6] completing a required minimum total of 69 credits in science.

Also required are the following non-science courses:

One philosophy or theology University requirement must be in the area of ethics. An ethics course with emphasis on environmental biology or life science issues, i.e., Environmental Ethics or Science, Technology, and Society, or other approved arts and letters courses.

Students must take Introduction to Microeconomics (ECON 10010 or 20010) as a social science University requirement.[7, 8]

Students are also urged to choose their electives from a recommended list of arts and letters courses.[9]

Requirements for the program are summarized in the table in this section.

Notes:

1. Equivalent or higher-level sequences in mathematics may be substituted, e.g., MATH 10850–10860 for MATH 10350–10360.

2. Students interested in the area of ecological modeling are strongly urged to take MATH 10550–10560 for their mathematics requirement. Other mathematics courses should be taken as science electives.

3. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350–10360 or MATH 10550–10560. Students having taken MATH 10250, 10110 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found later in this section.)

4. Students transferring into the ES or ES2 major, or transfer students who have previously taken a statistics course equivalent to ACMS 20340, MAY BE allowed to have this course count for BIOS 40411 (Biostatistics) with the permission of the ES Director. Students will be allowed to substitute ACMS 20340, or an equivalent statistics course (e.g., PSY 30100) as ES or ES2 majors in exceptional cases with the permission of the director of their major and the associate dean of the College of Science.

5. The 4-credit chemistry elective requirement is satisfied by either one additional course in organic chemistry (CHEM 20273) or Inorganic Chemistry (CHEM 20243) or by Analytical Chemistry (CHEM 30333, 31333) or by an alternative 4-credit CHEM course as approved by the director of their major and by the associate dean of the College of Science. Students are also allowed to take the 3-credit CHEM 10122 lecture or CHEM 20204 with the understanding that if/when a laboratory is established for that course, they will be required to take that lab prior to graduation.

6. The following are examples of many approved science electives for this program:

Botany (BIOS 30304) or at St. Mary's

Evolution (BIOS 30305)

The History of Life (BIOS 30310)

Genetics (BIOS 20250 or 20303)

Intro to Biocomputing (BIOS 30318)

Principles of Microbiology (BIOS 30401)

Animal Behavior (BIOS 30407)

Aquatic Ecology (BIOS 30420)

Stream Ecology (BIOS 40527)

Numerous other BIOS courses as designated by the ES director, including 60000-level graduate courses are accepted.

Environmental Chemistry (CHEM 20204)

Further chemistry electives (from Note 6 above)

Second course in general chemistry (CHEM 20274)

Principles of Biochemistry (CHEM 40420)

Computer Programming and Problem Solving (MATH 20210)

Calculus III (MATH 20550)

Introduction to Linear Algebra and Differential Equations (MATH 20580)

Differential Equations (MATH 30650)

Sedimentation and Stratigraphy (SC 30530)

Environmental Microbiology (SC 40350)

Environmental Mineralogy (SC 20520)

Geochemistry (SC 40300)

Geomorphology (SC 30500)

Select CE courses may be allowed with the approval of the associate dean, College of Science.

Other SC courses as approved by the ES director may be included as they become available. Select courses

offered in Study Abroad (UC-Dublin, UWA-Perth) also may be counted toward the ES science electives as well as select CE courses not cross-listed with SC, with permission of the ES director.

Students interested in attending graduate school in environmental sciences should consider taking science electives beyond requirements of this major. For example, for admission into some graduate programs, a year of organic chemistry would be a requirement. Deviations from the approved list of science electives must be approved by the advisor for the major.

7. The economics requirement for this major is fulfilled by taking Introduction to Economics (Microeconomics) either in the first year (ECON 10010) or in the second through fourth years (ECON 20010). Note, the course ECON 13181 (Social Science University Seminar) will not fulfill the economics requirement for this major.

8. For this major, the University social science requirement will be fulfilled by the required microeconomics course.

9. Numerous STV courses are recommended as electives, including Environment and Environmentalism in History (STV 30175); Self, Society and the Environment (STV 40319) and others as approved by the ES director. The STV courses may be taken either under the STV label or from the primary departmental cross-list.

10. As is the case for science first majors, six credits of the science course work in this program may also be counted toward the student's university science requirement.

11. While Biostatistics (BIOS 40411) is the preferred course, other 3- or 4-credit statistics courses required for completion of a first major (i.e., economics, psychology) may be substituted for BIOS 40411 with the permission of the ES2 director. MATH 101430 is not an acceptable substitute for BIOS 40411 or other statistics course, however. Although mathematics course work is not specifically required of this program, several required courses (BIOS 40411 or some of the first courses in physics) do have a prerequisite of one year of calculus (MATH 10350–10360 or equivalent). For all students in the College of Arts and Letters or the Mendoza College of Business, the mathematics sequence MATH 10350–10360 is acceptable for completion of the university mathematics requirement; thus, this sequence is recommended for students considering Environmental Sciences as a second major. Students lacking this mathematics background may have to take further course work in mathematics to meet the prerequisites in mathematics of courses in this program.

12. Chosen from approved biology or geology electives listed in note 7 above or one first course in physics (PHYS 10111 or 10310 or 10411 or 30210) or an approved survey course: Concepts of Energy and the Environment (PHYS 10052) or Energy and Society (PHYS 20051) and others as designated.

Sample Curriculum (B.S. Degree Majors):

First Year

*First Semester**

Biology I lecture and lab	4
Calculus I (or A)	4
General Chemistry I lecture and lab	4
Theology or Philosophy	3
Writing Requirement	3
Moreau First Year Seminar	1
	19

Second Semester

Biology II lecture and lab	4
Calculus II (or B)	4
Organic Chemistry I lecture and lab	4
Theology or Philosophy	3
Writing Requirement	3
	18

Sophomore Year

First Semester

Planet Earth lecture and lab	4
General Ecology lecture	3
Practical Ecology lab	2
Language I	4
Microeconomics	3
	16

Second Semester

CHEM Elective lecture [5]	3
Biostatistics	4
Language II	3
Theology or Philosophy	3
	13

Junior Year

First Semester

Physics I lecture and lab	4
Theology or Philosophy	3
Language III	3
Ways of Knowing IV	3
SCI Elective I	3
	16

Second Semester

Physics II lecture and lab	4
SCI Elective II	3
SCI Elective III	3
Ways of Knowing V	3
	13

Senior Year

First Semester

Current Topics	3
SCI Elective IV	3
SCI Elective V	3
Ways of Knowing VI	3
Free Elective [10]	3
	15

Second Semester

SCI Elective VI	3
Free Elective [10]	4
Free Elective [10]	3
Free Elective [10]	3
Moreau Senior Capstone	1
	14

***Ideally, students who decide to major in environmental sciences before beginning their first year should take BIOS 10171–10172.** This will allow for an additional year of relevant science and other electives to be included in their total curriculum. See notes accompanying BIOS 10171–10172.*

*** One of these must be a University Seminar (13180–18189).*

Honors. ES majors can participate in the Biological Sciences departmental honors program. See page 153 for more information.

ENVIRONMENTAL SCIENCES MAJOR WITH A CONCENTRATION IN EARTH SCIENCES

The following outlines the course requirements (totaling 34 credits) for Earth Sciences concentration:

CE 20520. Environmental Mineralogy
CE 20320. Environmental Aquatic Chemistry
CE 20300. Global Change, Water & Energy
CE 30530. Sedimentation and Stratigraphy
CE 30300. Geomorphology for Engineers and Earth Scientists
CE 34540. Petrology of Earth Materials
CE 30560. Dynamic Earth
CE 40300. Geochemistry
CE 40350. Environmental Microbiology
CE 40381. Environmental Isotope Geochemistry
CE 45200. Spring Field Trip
CE 45340. Field Trip
CE 47600. Earth Sciences Reading Course

First Year

(see core environmental sciences major)

Sophomore Year

First Semester

Planet Earth lecture and lab	4
General Ecology lecture	3
Practical Ecology lab	2
Language I	4
Microeconomics	3
	16

Second Semester

Global Change, Water and Energy	3
Environmental Aquatic Chemistry	3
CHEM Elective lecture and lab [5]	4
Language II	3
Theology or Philosophy	3
	16

Junior Year

First Semester

Environmental Mineralogy	3
Geomorphology	3
Physics I lecture and lab	4
Theology or Philosophy	3
Fall Field Trip	1
Language III	3
	17

Second Semester

Petrology of Earth Materials and Lab	4
Sedimentation and Stratigraphy	3
Physics II lecture and lab	4
Spring Field Trip	1
Ways of Knowing IV	3
	15

Senior Year

First Semester

Environmental Isotope Geochemistry	3
Geochemistry	3
Current Topics	3
Ways of Knowing V	3
Ways of Knowing VI	3
	15

Second Semester

Dynamic Earth	3
Biostatistics	4
Environmental Microbiology	3
Free Elective [10]	3
Free Elective [10]	3
	16

ENVIRONMENTAL SCIENCES AS A SECOND MAJOR

Most students who have a first major in one of the departments of the College of Arts and Letters or the Mendoza College of Business may participate in the Environmental Sciences Program as second majors. Because of the sizable overlap in requirements, students in the College of Arts and Letters who have a second major in preprofessional studies will not be allowed to add this second major program. Students in the College of Science may also pursue Environmental Sciences as a second major unless it is prohibited by their first major.

The requirements for second majors consist of the following science courses: [10]

General Biology (BIOS 10171+11173 and BIOS 10172+11174)

General Ecology (BIOS 30312, 31312)

Chemistry (CHEM 10171, 10172) or (CHEM 10171, 10122)

Environmental Chemistry (CHEM 20204) or approved alternative

Planet Earth (SC 20110 with lab)

Biostatistics (BIOS 40411)[11]

Biology or Geology elective (3 or 4 credits)[12]

The total required course work requires a minimum total of 32 credits in science beyond the University math requirement.

Note, the same policy applies for Environmental Sciences first and second majors: All College of Science courses specified by the major program must be taken at the University of Notre Dame. (An exception is made for any science courses taken for this major through an approved Notre Dame study abroad program.)

Sample Curriculum (Second Majors):
Students should remember that all science major programs require course work that builds upon prerequisites and thus require careful planning. A sample curriculum for second majors is given below. Note: Only the courses for the second major are listed.

First Year*

First Semester

Gen Chemistry I lecture and lab	4

Second Semester

Gen Chemistry II lecture and lab	4

Sophomore Year

First Semester

Biology I lecture and lab	4

Second Semester

Biology II lecture and lab	4

Junior Year

First Semester

Planet Earth lecture and lab	4

Second Semester

Biostatistics	4
CHEM requirement**	3

Senior Year

First Semester

General Ecology lecture	3
Practical Ecology lab	2

Second Semester

Course selection(s) to complete second major as needed.

MATH 10350–10360 or equivalent are* **not *included in the minimum total of 37 credits in this sequence; satisfies the University math requirement.*

***Students may take CHEM 20204 (Environmental Chemistry) or SC 20100 (Environmental Geosciences) or SC 30111 (Environmental Geology) or other approved CHEM, CE, or SC electives.*

****Students whose final requirement is a three-credit class in BIOS, CE, or SC may take BIOS 40491 to complete the major with the permission of the director of the ES major.*

SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ENVIRONMENTAL SCIENCES MAJOR

	Credits
Biological Sciences	16
Chemistry	12
Geology	4
Mathematics	8
Physics	8
Current Topics	3
Science Electives	18
Total Science	69
Language	Intermediate-Level Competency (3)
University Requirement	3
Philosophy*	6
Theology*	6
University Requirement	3
University Requirement	3
University Requirement	3
Moreau Program***	2
Free Electives	28**
	124

** One of these courses must be a University Seminar 13180–13189*

*** Assumes intermediate-level competency in language was achieved by taking a minimum of one three-credit course*

****Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.*

MINOR IN SCIENCE AND PATIENT ADVOCACY

Director:
Barbara Calhoun, MSN, RN, PNP
Faculty Steering Committee:
Crislyn D'Souza-Schorey, PhD
Rebecca Wingert, PhD
Xin Lu, PhD
Kasturi Haldar, PhD

The mission of the Interdisciplinary Minor in Science and Patient Advocacy is to provide undergraduate students with critical skills and understanding of the multifaceted challenges needed to advocate effectively for rare disease patients. The core of patient advocacy is to know disease at the molecular, genetic and clinical levels and use that information to help patients find treatments. This minor in Science and Patient Advocacy provides an integrated framework that will provide students with needed skills to become effective patient opinion leaders who have enormous influences in health outcomes at all levels in our society.

This adjunctive patient advocacy minor provides needed skills to collaborate with stakeholders such as researchers, clinicians, regulators, pharmaceutical companies and patients to bridge the gaps in knowledge exchange and positive health outcomes. It also provides scientific training in advanced knowledge of current and emerging technologies in research and clinical medicine relevant to rare diseases with the goal of providing trainees the scientific proficiency needed to be effective patient advocates of rare disease.

This minor is an extension of the basic science requirements for health professions and science related majors in Biological Sciences and from departments within the College of Science. This interdisciplinary program enhances the mission of Notre Dame to provide students with effective patient advocacy skills to facilitate resolution of the social, economic, and medical issues faced by patients with rare diseases. The minor requires fifteen credit hours of academic work described as follows.

The primary course required for this minor is **BIOS 40450 Introduction to Science and Patient Advocacy** (3 credits). This is a three-credit course offered in the spring; required of all students enrolled in the minor. A major goal of this course is to have students develop skills to study the natural history of rare diseases through review of patient de-identified medical records. The course is designed to integrate the scientific basis of clinical research with patient centered components of advocacy.

The secondary course for this minor is **BIOS 40550/60550–Section 1, Topics in Personalized Medicine (2 credits).** Required of all students in the minor and offered in the fall semesters. This course introduces current and emerging technologies in scientific research with a specific focus on concepts relevant to precision-based individualized medicine. The overall format for this class will be a detailed discussion of highlighted journal articles relevant to the topic discussed. This class will meet once weekly and will be open to both juniors and seniors enrolled in the minor program. The class will also include graduate students interested in advanced topics of research. Having a class composition of both undergraduate and graduate students is a particular strength of this course, as it maintains a standard of rigor typical of an advanced level class.

BIOS 40451 Rare Disease Advocacy Immersion (1 credit) is the community based course required for the minor. Designed to immerse students in real advocacy based projects in partnership with patient service organizations. The goal is to partner with different patient organizations each semester to broaden our reach and expand partnerships. Students actively engage in real-life patient advocacy experiences unique to this minor program.

BIOS 40565 Topics in Rare Disease Advocacy and Policy (3 credits). BIOS 40565 is the capstone course for the minor and offered in the spring semesters. It is designed as the culminating course to integrate the scientific basis of clinical research with patient centered components of advocacy. Direct partnerships with patients/families is key to understanding the challenges faced by those living with rare diseases. Topical modules include health equity in rare, bioethics, legislative, regulatory affairs and policy issues in rare diseases.

Electives (6 credits total). Two courses are required from the list of approved electives in the areas of biology, neuroscience, psychology, ethics, and policy/social justice in medicine. The following elective courses are regularly offered:

SCPP 30300. Intro to Clinical Ethics
BIOS 30301. Embryology
BIOS 30418. Medical Molecular Genetics
BIOS 60570. Section 01: Topics in Cell Biology
BIOS 40436. Section 01: Intro to Molecular and Medical Pharma
BIOS 40419. Immunology
BIOS 40203. Neuroinfectious Disease
BIOS 30341. Cell Biology
BIOS 30455. Medical Microbiology
STV 30405. Section 02: Compassionate Care in Medicine
STV 29697. Section 01: How Pharma Create Us
PSYC 43531. Psychology and Medicine
SC 40350. Intro to Hospice and Palliative Care
BIOS 40339. Human Gross Anatomy
BIOS 30344. Human Physiology
CHEM 40531. Hallmarks of Cancer & Therapy
BIOS 40420. Mol. Epidemiology of Infectious Disease
BIOS 30338. Advanced Neurobiology
BIOS 40202. Developmental Neuroscience
BIOS 40580. Neurobiology of Pain
BIOS 40310. Cancer Immunotherapy
BIOS 24241. Molecular Cell Biology
CHEM 40420. Principles of Biochemistry
BIOS 20303. Fundamentals of Genetics
SCPP 30401. Medical Counseling Skills
CSC 33314. Abled in a Disabled World

To enroll or discuss an interest in the program, please schedule a consultation schedule a consultation with the minor's program manager, Katrina Conrad kconrad2@nd.edu.

MINOR IN SUSTAINABILITY

Director of the Minor in Sustainability:
Philip Sakimoto, Physics

Advisory Committee:
Ellis Adams, Geography
Jon Coleman, History
Alan Hamlet, Civil Engineering
Jason McLachlan, Biological Sciences
Samuel Miller, Innovation and Entrepreneurship
Jennifer Tank, Environmental Change Initiative

The Minor in Sustainability is a course of study for undergraduates from broadly diverse academic disciplines. It examines the footprint of humanity on Earth's systems and ways to reduce that footprint to achieve social well-being and environmental protection. Faculty from multiple Colleges teach the principles and practices of sustainability from varied perspectives to provide a unique and dynamic curriculum. The curriculum is designed to augment disciplinary coursework in an area of major study so that students learn to integrate diverse ways of thinking and appreciate interdisciplinary problem-solving.

Students in the minor receive training in the principles and practices of sustainability through formal courses and independent study. Graduates of the minor will be equipped with knowledge and skills about sustainability, an ability to communicate about sustainability, and an imperative to implement sustainable practices. Graduates will be prepared to make substantive contributions to the development of more sustainable practices, practices that benefit their personal and professional lives, the lives of others, and the lives of future generations. Students will also be well positioned for in-depth study on sustainability at the post-baccalaureate level. Finally, the study of Catholic traditions and social and environmental ethics will help students understand the role that religious commitment can play in achieving sustainability.

Students can apply for admission to the minor in their first year, sophomore year, or junior year by contacting the director of the minor. They are required to take a gateway course SUS 20010 Sustainability: Principles and Practices, an interdisciplinary course taught by faculty from multiple departments across the University. This course should be taken at or near the beginning of study in the minor.

Students then select from a list of approved courses totaling at least three 3-credit courses and one 1-credit course. The 3-credit courses fall into four categories: Design (SUS1), Natural Systems (SUS2),

Social Institutions (SUS3), and Individual Behavior and Values (SUS4). Courses are tagged as such using the course attributes which are searchable via the University's online Class Search. Students must take at least one 3-credit course from three out of the four elective categories. At least two of these courses must be from outside of their major College. The 1-credit course is an experiential or seminar course designated by the attribute SUSE. These include field-based courses and seminars, and also immersion experiences through the Institute for Social Concerns. Students planning to study abroad are encouraged to petition for approval of relevant courses at their international institution before they leave campus.

Students begin defining capstone projects in the spring semester of their penultimate year. These are to be research projects, but may also be fine arts or community service projects with a research base. To facilitate this process, they will enroll in a non-credit, asynchronous independent study course (SUS 38002). Students studying abroad in the Spring, or students who want an early start, may enroll in SUS 38002 in their penultimate Fall semester instead of in the Spring. Following guidance provided by the Director of the Minor, they will be required to identify a faculty member who has agreed to serve as their advisor and to submit a preliminary proposal for their capstone project. Students will receive feedback on their proposals from the Sustainability Minor Advisory Board and may be required to resubmit their proposals with modifications to gain approval. Students wishing to start their project earlier (for example, the summer before their junior year) should submit their full proposal before they begin their research. Students will enroll in one credit of independent study in the fall of their final year (SUS 48001), during which they will submit a full proposal and begin the substantive part of their project, and one credit of independent study in the spring (SUS 48002), during which they will complete their project work, submit a report on their research findings, and present their work at a College of Science research fair and/or other relevant venue. Students wishing to partner with another student for their capstone project or to combine their capstone with a thesis in their home department are encouraged to consult with the director of the minor.

Additional details about the Minor in Sustainability can be found online at susminor.nd.edu.

Chemistry and Biochemistry

Chair:
Steven Corcelli
Charles Huisking Professor of Chemistry & Biochemistry:
Brian Blagg
Coleman Professor of Life Sciences:
Brian M. Baker
Emil T. Hofman Professor of Chemistry: Bradley D. Smith
George and Winifred Clark Professor:
Christian Melander
Kleiderer-Pezold Professor of Biochemistry:
Francis J. Castellino
Kleiderer-Pezold Professor of Biochemistry:
M. Sharon Stack
Navari Family Professor of Life Sciences:
Shahriar Mobashery
Rev. John Cardinal O'Hara Professor:
Patricia L. Clark
Rev. John A. Zahm Professor of Science:
Prashant V. Kamat
Arthur J. Schmitt Professor of Chemical & Biomolecular Engineering:
Paul W. Bohn
Grace-Rupley Professor of Chemistry and Biochemistry:
Olaf Wiest
Notre Dame Collegiate Professor:
Gregory V. Hartland
W.K. Warren Family Professor:
Juan R. Del Valle
Professors:
Brandon L. Ashfeld; Seth N. Brown; Jon P. Camden; Ian Carmichael; J. Daniel Gezelter; Holly V. Goodson; Paul Helquist; S. Alex Kandel; Masaru K. Kuno; Marya Lieberman; Anthony S. Serianni; Slavi C. Sevov; Richard E. Taylor
Campbell Family Associate Professor of Cancer Research:
Laurie E. Littlepage
Associate Professors:
Jessica A. Brown; Matthew M. Champion; Vlad M. Iluc; Jeffrey W. Peng; Emily Y. Tsui
John V. O'Connor Assistant Professor in Cancer Drug Discovery:
Brittany S. Morgan
Clare Boothe Luce Assistant Professor:
Katharine A. White
Assistant Professors:
Hsing-Ta Chen; Saurja DasGupta; Kaiyu Fu; Adam Jaffe; Mari Morimoto
Teaching Professors:
DeeAnne Goodenough-Lashua; Steven Wietstock
Associate Teaching Professors:
Rachel Branco; Susan Del Valle; Dana Horgen; Dana Lashley; Shawn Miller; Bahram Moasser; Sarah West; Kelley M. H. Young
Assistant Teaching Professors:
Julie Kessler; Douglas Miller
Emeriti:
Xavier Creary; Norman J. Dovichi; Thomas P. Fehlner; Mary Galvin; Paul W. Huber; A. Graham Lappin; Joseph P. Marino; Dan Meisel; Marvin J. Miller; Thomas L. Nowak; W. Robert Scheidt; Anthony M. Trozzolo

Program of Studies. Chemistry is the science of substances that comprise the world about us and is concerned with their structure, their properties and the reactions that change them into other substances. Chemists and biochemists practice their profession in many ways—in educational institutions, government laboratories, private research institutions and foundations and in many commercial areas, including the chemical, drug, health, biotechnology, pharmaceutical and food industries.

The Department of Chemistry and Biochemistry has a strong undergraduate program together with a strong graduate education and research program. The graduate program greatly benefits undergraduate education by attracting highly qualified faculty and results in the availability of excellent research facilities and modern instrumentation necessary to train the scientists of tomorrow. This department is able to provide an excellent program of undergraduate research to complement regular course work. Student participation in research is highly encouraged as a key part of the education of chemistry and biochemistry majors.

The programs in chemistry and biochemistry described in the following pages prepare students for graduate studies and professional work in the chemical and biochemical sciences, as well as in interdisciplinary areas that rely heavily on chemistry. Bachelor of science degrees are offered with a major in chemistry or a major in biochemistry. The department additionally offers a minor in chemistry. At the graduate level, a master of science and doctor of philosophy are offered, as described in the *Graduate School Bulletin of Information.*

BACHELOR OF SCIENCE WITH A MAJOR IN CHEMISTRY

The chemistry curriculum at Notre Dame includes the Chemistry Career Program, the Chemistry with Computing Program, and Chemistry with a concentration in Neuroscience.

All chemistry majors take the following basic sequence of courses:

General Chemistry (CHEM 10181, 11181) [1]

Organic Chemistry (CHEM 10182, 11182, 20283, 21283) [1]

Inorganic Chemistry (CHEM 20284, 21284, 40443, 41443) [1]

Physical Chemistry (CHEM 30321, 30322, 31322)

Analytical Chemistry (CHEM 30333, 31333)

Physical Methods of Chemistry (CHEM 40434 or CHEM 40436)

Principles of Biochemistry (CHEM 40420)

Chemistry Seminars (CHEM 23201, CHEM 23202, CHEM 23203), three semesters

Physics (PHYS 10310, 11310, 10320, 11320 or PHYS 20210, 21210, 20220, 21220)

Mathematics (MATH 10550, 10560, and CHEM 20262) [2]

1. Upon request and with departmental approval 10182/11182, 20283/21283, 20284/21284 may be substituted by 10172/11172, 20273/21273, 20274/21274 respectively.

2. MATH 10350, 10360 can be substituted for MATH 10550, 10560 with department approval.

In addition to this basic sequence, the following courses are required for each program.

Chemistry Career Program
Science Electives (6 credit hours)

Chemistry with Computing
Each student completes 15 additional credit hours of computing courses in consultation with a departmental advisor.

CSE 20311/21311 Fundamentals of Computing
CSE 20312/21312 Data Structures
CSE Electives (7 credit hours)
CSE or Scientific Computing Electives (3 credit hours)

Chemistry with Neuroscience Concentration
Each student completes 15 additional credit hours of Neuroscience courses in consultation with a departmental advisor.
Note: Introductory Psychology (PSY 10000/20000) is a required prerequisite for most NSBH courses.

BIOS 10172* Biology II: Molecules to Ecosystems

NSBH 20450/21450 Neuroscience and Behavior w/lab

NSBH 30301 Molecular Neuroscience

NSBH 30520 Introduction to Cognitive Neuroscience

NSBH Elective I

NSBH Elective II

** Although not required for the chemistry major, this biology course is a prerequisite for the neuroscience courses.*

Sample Curriculum (Career Program): [1]

First Year

First Semester	
CHEM 10181	4
CHEM 11181	0
MATH 10550	4
PHYS 10310	4
University Requirement	3
University Requirement	3
Moreau First Year Seminar	1
	19

Second Semester	
CHEM 10182	4
CHEM 11182	0
MATH 10560	4
PHYS 10320	4
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester	
CHEM 20283	3
CHEM 21283	1
CHEM 23201	1
Language	3
University Requirement	3
Elective	4
	15

Second Semester	
CHEM 20284	3
CHEM 21284	1
CHEM 20262	3
Language	3
Electives	6
	16

Junior Year

First Semester	
CHEM 30321	3
CHEM 30333	3
CHEM 31333	1
CHEM 23203	1
Elective (or Language)	3
University Requirement	3
	14

SUMMARY OF MINIMAL REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN CHEMISTRY AND BIOCHEMISTRY

	Chemistry Career Program	*Chemistry Combination Program*	*Biochemistry Program*
Chemistry	42	42	29
Biochemistry	3	3	8
Biological Sciences	—	—	18*
Mathematics	8	8	8
Physics	8	8	8
Science Electives	6	3	—
Total Required Science	67	64	71
Program Electives	—	15	—
Total	67	79	71
Moreau Program	2	2	2
Language		Intermediate-Level Competency	
University Requirement	3	3	3
Philosophy+	6	6	6
Theology+	6	6	6
University Requirement	3	3	3
University Requirement	3	3	3
University Requirement	3	3	3
Free Electives	20++	8++	16++
	124	**124**	124

+ One of these courses must be a University Seminar.

++ Assumes intermediate-level competency in language was achieved by taking two 4-credit introductory-level and one 3-credit intermediate-level course.

** The advanced BIOS labs (BIOS 21303, BIOS 31341) may be replaced by undergraduate research in the sciences (e.g. CHEM 48498).*

Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

Second Semester

CHEM 30322	3
CHEM 31322	2
Science Elective	3
University Requirement	3
Elective	3
	14

Senior Year

First Semester

CHEM 40420	3
CHEM 40443	3
CHEM 41443	2
Electives	3
University Requirement	3
	14

Second Semester

CHEM 40434 or 40436	
CHEM 23202	1
Science Electives	3
Electives	6
Moreau Senior Capstone	1
	14

Notes:

1. A curriculum starting with 16 credits in the first year is possible. In this case a University Requirement may also be postponed until the junior or senior year.

BACHELOR OF SCIENCE WITH A MAJOR IN BIOCHEMISTRY

The biochemistry curriculum emphasizes the chemical basis of biological processes. All biochemistry majors are required to take the following courses:

General Chemistry (CHEM 10181, 11181) [1]
Organic Chemistry (CHEM 10182, 11182, 20283, 21283)
Inorganic Chemistry (CHEM 20284, 21284)
Physical Chemistry (either CHEM 30338 or CHEM 30321/30322)
Analytical Chemistry (CHEM 30333, 31333)
Chemistry Seminars (CHEM 23201, 23202, 23203), three semesters
Biochemistry Seminar (CHEM 23212)
Biochemistry (CHEM 30341, 31341, 30342)
Mathematics (MATH 10550, 10560, and CHEM 20262) [2]
Physics (PHYS 10310, 11310, 10320, 11320 or PHYS 20210, 21210, 20220, 21220)
Biology (BIOS 10171–10172, 11173–11174)
Genetics (BIOS 20303)
Cell Biology (BIOS 30341)
Molecular Biology (BIOS/CHEM 50531)

1. Upon request and with departmental approval 10182/11182, 20283/21283, 20284/21284 may be substituted by 10172/11172, 20273/21273, 20274/21274 respectively.

2. MATH 10350, 10360 can be substituted for MATH 10550, 10560 with department approval.

Sample Curriculum (Biochemistry Program):[1]

First Year

First Semester

CHEM 10181	4
CHEM 11181	0
MATH 10550	4
BIOS 10171	3
BIOS 11173	1
University Requirement	3
University Requirement	3
Moreau First-Year Seminar	1
	19

Second Semester

CHEM 10182	4
CHEM 11182	0
MATH 10560	4
BIOS 10172	3
BIOS 11174	1
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester

CHEM 20283	3
CHEM 21283	1
CHEM 23212	0
CHEM 23201	1
BIOS 30341	3
Language	3
University Requirement	3
	14

Second Semester

CHEM 20284	3
CHEM 21284	1
BIOS 20303	3
CHEM 20262	3
Language	3
	13

Junior Year

First Semester

CHEM 30341	3
CHEM 31341	2
CHEM 23203	1
PHYS 20210	4
Elective (or Language)	3
	13

Second Semester

CHEM 30338	3
CHEM 30342	3
PHYS 20220	4
University Requirement	3
Elective	3
	16

Senior Year

First Semester

CHEM 30333	2
CHEM 31333	2
BIOS/CHEM 50531	3
University Requirement	3
Elective	3
	13

Second Semester

CHEM 23202 [5]	1
University Requirement	3
Electives	9
Moreau Senior Capstone	1
	14

Notes:

1. A curriculum starting with 16 credits in the first year is possible. In this case a University Requirement may also be postponed until the junior or senior year.

Biochemistry with Neuroscience Concentration
Each student completes 15 additional credit hours of Neuroscience courses in consultation with a departmental advisor.
Note: Introductory Psychology (PSY 10000/20000) is a required prerequisite for most NSBH courses.

NSBH 20450/21450 Neuroscience and Behavior w/lab[§]
NSBH 30301 Molecular Neuroscience
NSBH 30520 Introduction to Cognitive Neuroscience
NSBH Elective I
NSBH Elective II

§The Neuroscience and Behavior lab can be used to fulfill the upper level biology lab requirement.

MINOR IN CHEMISTRY

Program Overview: The minor in chemistry requires 17 credits of study in chemistry. To enter the minor, students must have completed one of the following courses: CHEM 10171, 10181, 10097, 10099.

Program Restrictions

- Following COS policy, at least 50% of the courses for the minor must be unique (not double counted at the major, college, or university level).
- As a COS minor, all courses for this minor must be taken at the University of Notre Dame, or through a UND approved study abroad program.
- Independent research credits cannot be used towards the minor.
- A grade point average of 2.0 or better in the minor courses is required.
- Biochemistry / SCPP majors cannot add the chemistry minor.

All chemistry minors take the following basic sequence of courses.

Organic Chemistry with Lab (CHEM 10172/11172 or CHEM 10182/11182 or CHEM 10176/11172)
Chemistry Across the Periodic Table with Lab (CHEM 20274/21274 or CHEM 20284/21284) [1]

Additional Coursework: Students must complete an additional 9 credits of chemistry, with 6 of these credits at the 30000 level or higher. The courses must span at least two of the Areas below and only one course can come from Area 4.

AREA 1: *Organic and Inorganic Chemistry*

CHEM 20273 or 20283, 40443, 40610, 40616, 40630, 40631, 40632, 40634, 40438, 60635, 40618, 60535

AREA 2: *Biochemistry*

CHEM 30341, 30342, 40420, 40560, 50531

AREA 3: *Physical and Analytical Chemistry*

CHEM 30333, 30321 or 30324 or 30338, 30322, 40435, 40436, 40541, 40533, 40650

AREA 4: *Electives in Chemistry*

CHEM 20204, 30301, 30331, 40426

Notes:

1. CHEM 10122 General Chemistry—Principles and Processes can be considered as a replacement for CHEM 20274 on a case-by-case basis, with departmental pre-approval.

HONORS IN CHEMISTRY AND BIOCHEMISTRY

Majors in chemistry and biochemistry may apply for the departmental honors program if they have a minimum grade point average of 3.5 and are enrolled in undergraduate research CHEM 48498. Application should be made to the Director of Undergraduate Studies via the online application (see Department of Chemistry and Biochemistry webpage) by the end of the first week of classes in the Senior Year. The requirements for completion of the honors program are a minimum of two semesters of undergraduate research after the beginning of the junior year, the course CHEM 48500 (research thesis) with a grade of B or better, and a grade point average of 3.5 or better.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Chemistry and Biochemistry*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Graduate courses in chemistry are open to qualified advanced undergraduate students, subject to the approval of the departmental advisor. These courses are listed in the *Graduate School Bulletin of Information.*

Mathematics

Chair:
David Galvin
Associate Chair:
Peter Cholak
Director of Graduate Studies:
Samuel R. Evens
Director of Undergraduate Studies:
Andrei Jorza
William J. Hank Family Professor of Mathematics:
Anand Pillay
John and Margaret McAndrews Professor of Mathematics:
Mark Behrens
John A. Zahm, C.S.C., Professor of Mathematics
Stephen A. Stolz
Glynn Family Honors Collegiate Professor:
Claudia Polini
Notre Dame Professor of Topology:
Andrew Putman
Professors:
Peter A. Cholak; Francis X. Connolly (emeritus); Jeffrey A. Diller; Natasha Dobrinen; William G. Dwyer (emeritus); Matthew J. Dyer; Samuel R. Evens; Leonid Faybusovich (emeritus); David Galvin; Michael Gekhtman; Karsten Grove (emeritus); Matthew Gursky; Alexander J. Hahn (emeritus); Brian C. Hall; Qing Han; Alex A. Himonas; Richard Hind; Julia F. Knight (emeritus); Francois Ledrappier (emeritus); Juan Migliore; Gerard K. Misiolek; Liviu Nicolaescu; Claudiu Raicu; Mei-Chi Shaw (emeritus); Roxana Smarandache; Brian Smyth (emeritus); Dennis M. Snow (emeritus); Nancy K. Stanton (emeritus); Sergei Starchenko; Laurence R. Taylor; Warren J. Wong (emeritus); Jiahong Wu; Frederico Xavier (emeritus)
Associate Professors:
Katrina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Steven Karp; Pavel Mnev; Eric Riedl; Marianna Russkikh; Christopher Schommer-Pries; Shuddhodan Kadattur Vasudevan
Assistant Professors:
Nicholas Edelen; Alexandra Kjuchukova; Juanita Pinzón Caicedo; Nicholas Ramsey; Nick Salter
Professors of the Practice:
Arthur Lim; Neil Nicholson; Annette Pilkington
Associate Professor of the Practice:
Andrei Jorza
Assistant Teaching Professors:
Brian Mulholland; Kathryn Mulholland

Program of Studies. Mathematics has had a profound effect upon civilization since ancient times, when the legend originally inscribed on the entrance to Plato's academy was "Let no one ignorant of geometry enter here." It was equally true during the medieval period, when arithmetic and geometry constituted two of the seven subjects considered essential for a liberal education. It has been said that the second most influential book in the span of Western civilization—after the Bible—is Euclid's *Elements.* Although mathematics is usually associated with science and technology in the modern mind, it seems apparent from the writings of the great mathematicians of the 17th and 18th centuries that religious belief played a great role in their pursuit of mathematics. They saw the "system of the world" obeying mathematical laws and as a consequence felt impelled to study mathematics so as to better appreciate the world's Creator.

Mathematics continues to have a profound influence in our century. From the theory of relativity, with its applications to the study of the large-scale structure of the universe, to the development of the modern computer, with its manifold applications in science, technology and business, mathematics has played a fundamental role. It is surely the most universal of all scientific tools, and the student equipped with a strong mathematical background will be in the enviable position of being able to employ his or her expertise in any area in which rigorous thought and precision of results are mandated.

The department is dedicated to the development of undergraduate studies, to the teaching of mathematics to scientists, engineers and teachers, to graduate education and research, and to the discovery of new mathematics. The entire faculty is involved with undergraduate affairs, and students have the opportunity of associating with scholars of international repute. Mathematics at Notre Dame provides students with a discipline of the mind and a stimulation of the imagination par excellence.

Programs in mathematics prepare students for graduate studies or for professional work in fields in which mathematics plays a dominant role. They provide an excellent preparation for law school, medical school, business school and secondary school teaching. Graduates may enter careers in research institutes or industrial or government positions.

In addition to its undergraduate programs, the department offers programs of graduate study leading to the degree of doctor of philosophy, as described in the Graduate School *Bulletin of Information.*

The department recognizes that, besides those students who wish to pursue a career devoted primarily to mathematical research and teaching, many will wish to take positions in business, industry or government where they will be using their mathematical skills in close collaboration with engineers as well as biological, physical and social scientists. These students will find among the listed programs one well suited to their needs. Besides these programs a student may, in consultation with the director of undergraduate studies and the department chair, create a program especially tailored to his or her career goals.

BACHELOR OF SCIENCE WITH A MAJOR IN MATHEMATICS

The mathematics curriculum at Notre Dame includes six course sequences or areas of concentration within the College of Science. These programs are designed to accommodate the academic and professional interests of all mathematics majors. Brief descriptions are given below, and more detailed descriptions of these programs are available on request from the Department of Mathematics.

College Requirements. All must take the following College of Science courses: (CHEM 10171, 10172) or (CHEM 10171, 10122); PHYS (10310 or 10093) and PHYS (10320 or 10094); and an additional science elective.

A student who takes two semesters of organic chemistry or two semesters of general biology is only required to take PHYS (30210 or 10095) and (30220 or 10096).

Mathematics Honors Program
This program is suited to students who are interested in graduate work in one of the mathematical sciences and to those whose career plans require a strong background in modern mathematics.

Honors Mathematics I (MATH 10850)
Honors Mathematics II (MATH 10860)
Honors Mathematics III (MATH 20850)
Honors Mathematics IV (MATH 20860)
Honors Algebra I (MATH 20810)
Honors Algebra II (MATH 20820)
Honors Algebra III (MATH 30810)
Honors Algebra IV (MATH 30820)
Honors Analysis I (MATH 30850)
Honors Analysis II (MATH 30860)
Electives (12 credit hours with six at the 40000 level)

Mathematics Courses for the Other Programs
All other mathematics programs (except the computing program) require the following mathematics core courses:

Calculus I (MATH 10550)
Calculus II (MATH 10560)
Calculus III (MATH 20550)
Ordinary Differential Equations (Math 20750) or Probability (Math 30530)
Linear Algebra (MATH 20610)
Introduction to Math Reasoning (MATH 20630)
Algebra (MATH 30710)
Real Analysis (MATH 30750)

In addition to this basic sequence, the following courses are required for each program:

Mathematics Career Program
This program is designed to give students a general background in mathematics. In addition to the basic sequence of courses listed above, 15 credit hours of mathematics electives are required, at least three of which are at the 40000 level.

Mathematics and Life Sciences Program
This program is designed for mathematics majors who are interested in life-science-oriented careers.

The following mathematics courses are required in addition to the basic sequence of courses listed above:

Introduction to Probability (MATH 30530)
Mathematical Statistics (ACMS 30540)
Elective in Mathematics (three credit hours at the 40000 level)

The following College of Science courses are required:

Chemistry (CHEM 10171, 10172, 20273, 20274)
Biology I and II (BIOS 10171–10172)
Genetics (BIOS 20303, 21303)

Mathematics and Computing Program
This program is designed for students who plan to pursue graduate study or industrial careers in computing science. All of the mathematics core courses listed above are required, as well as 15 hours of mathematics electives, at least three hours of which are at the 40000 level.

In addition, students must take 5 CSE courses at the major's level where 2 of the 5 courses are required to be CSE 20311 and 20312.

Mathematics Education Program
This program is designed for students who plan a career in secondary education. The following mathematics courses are required in addition to the basic sequence listed above:

Introduction to Probability (MATH 30530)
Mathematical Statistics (ACMS 30540)
Geometry (MATH 361 at Saint Mary's College, 3 credit hours)
Discrete Math (MATH 30210, 40210 or 40220, 3 credit hours)
One Mathematics elective (3 credit hours)

(One of these classes must be at the 40000 level)

The following education courses are to be taken at Saint Mary's College: EDUC 201, 220, 340, 345, 346, 356, 451, and 475.

Mathematics and Engineering Science Program
This program is designed for students interested in applied or industrial mathematics. In addition to the mathematics core courses, the student is required to take one of MATH 40480, MATH 40390 or MATH 40750, and 12 more credits of mathematics electives. The student must also complete one of the following two sequences of engineering classes:

Thermal option: AME 20221, AME 20222, AME 30331, AME 20231, AME 30334
Structures and design option: AME 20221, AME 20241, AME 20231, CE 30200, CE 30210

Mathematics as a Second Major
Students in the Mendoza College of Business or the College of Arts and Letters may pursue a second major in mathematics by completing all mathematics courses required for the career mathematics concentration. See the list below. To list mathematics as a second major on the transcript, the student must satisfy all of the requirements for a major in some department of the Mendoza College of Business or the College of Arts and Letters.

MATH 10550–10560–20550. Calculus I-III	11.5
MATH 20750. Ordinary Differential Equations or MATH 30530. Probability	3
MATH 20610. Linear Algebra	3
MATH 20630. Introduction to Abstract Math	3
MATH 30710. Algebra	3
MATH 30750. Real Analysis	3
Mathematics Electives	15*
	42 credits

Supplemental Major in Mathematics for Engineering
Students in the College of Engineering may pursue a supplemental major in mathematics by completing all of the mathematics courses required for the career mathematics concentration in addition to completing the mathematics requirements for the engineering degree. In practice this means that students must take 24 unique credits of mathematics courses in addition to what is required for their engineering major and that this list must include MATH 20630, MATH 30710, and MATH 30750.

Supplemental Major in Honors Mathematics for Engineering
Students in the College of Engineering may pursue a supplemental major in honors mathematics by completing all of the mathematics courses required for the career mathematics concentration in addition to completing the mathematics requirements for the engineering degree. In practice this means that students must take 24 unique credits of mathematics courses in addition to what is required for their engineering major and that their math requirements for both their engineering major as well as their math supplemental major will come from the honors sequences. Specifically, that students will take MATH 10850–10860; MATH 20850–20860; MATH 20810–20820; MATH 30810–30820; and MATH 30850–30860 in place of courses such as MATH 10550, 10560, 20550, and 20580.

Sample Curriculum

(Mathematics Career Program):

First Year

First Semester

MATH 10550. Calculus I	4
CHEM 10171. Chemical Principles	4
PHYS 10310. Engineering Physics I	4
University Requirement	3
University Requirement	3
Moreau First-Year Seminar	1
	19

Second Semester

MATH 10560. Calculus II	4
CHEM 10172 or 10122	4
PHYS 10320. Engineering Physics II	4
University Requirement	3
University Requirement	3
	18

Sophomore Year

First Semester

MATH 20610. Linear Algebra	3
MATH 20550. Calculus III	3.5
—Language	3
University Requirement	3
Science Elective	3
	15.5

Second Semester

MATH 20630. Introduction to Math. Reasoning	3
MATH 20750. Ordinary Differential Equations	3
Mathematics Elective	3
Language	3
University Requirement	3
	15

Junior Year

First Semester

MATH 30710. Algebra	3
Mathematics Elective	3
Language	3
University Requirement	3
Elective	3
	15

Second Semester

MATH 30750. Real Analysis	3
University Requirement	3
Electives	9
	15

Senior Year

First Semester

Mathematics Electives	6
Electives	9
	15

Second Semester

Mathematics Elective	3
Electives	9
Moreau Senior Capstone	1
	13

[1] *The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. It is recommended that one course in history or social science be taken in the first year and one philosophy and one theology course be taken by the end of the sophomore year.*

The Senior Thesis for Mathematics Majors

Students in the mathematics program have the option of writing a thesis on a subject in mathematics, or in an interdisciplinary area connected to mathematics. Such a thesis is strongly encouraged for math honors students and is intended to give the student a better sense of how mathematics is done and used, and to develop in the student the habit of learning mathematics and its applications in an independent setting. In most cases, this work would be expected to be expository, but based on advanced-level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject, or to explore one of the many interesting connections that mathematics has with other disciplines.

In the second semester of the junior year and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis. The thesis is to be crafted during the second semester of the senior year, and must be submitted to the Director of Undergraduate Studies by April 15 of the senior year. If the thesis is approved, the citation of "Graduation with Senior Thesis" will appear on the student's transcript.

In the second semester of the junior and senior years, the student attends the senior thesis writing seminar Math 48900, while in the first semester of the senior year, the student receives credit for Math 48800.

Students interested in writing a senior thesis should contact the director of undergraduate studies in the Department of Mathematics.

MINOR IN ACTUARIAL SCIENCE

The Department of Mathematics offers actuarial science as an academic minor. There is a heavy demand for the business courses which are required for this minor, and students are not guaranteed registration availability for these courses. Please see the academic advisor for more information. The actuarial science minor requires completion of the following nine courses:

MATH 30530. Probability	3
MATH/ACMS 30540. Statistics	3
MATH 30610. Introduction to Financial Mathematics	3
One mathematics elective at the 30000-level or above	3
BASC 20100 or ACCT 20100. Accountancy I	3
BASC 20150 or FIN 20150. Corporate Financial Management	3
ECON 20020. Principles of Macroeconomics	3
ECON 10010/20010. Principles of Microeconomics	3
Actuarial Elective	3
Total: 27	

Among the nine courses required for the minor, up to four courses can be double-counted for the student's major.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Mathematics.* Course descriptions can be found by clicking on the subject code and course number in the search results.

Certain graduate courses in mathematics are open to qualified advanced undergraduates, subject to the approval of the director of undergraduate studies. Other graduate courses are described in the *Graduate School Bulletin of Information.*

Neuroscience and Behavior

Director of Undergraduate Studies:
Nancy Michael

Program in Neuroscience and Behavior. Neuroscience is a relatively young, exciting, and fundamentally interdisciplinary field devoted to the scientific study of the nervous system. Neuroscience encompasses the study of problems from multiple disciplinary perspectives at different levels of analysis in human and non-human organisms. It includes, for example, the study of molecular mechanisms in individual neurons and the coordination of millions of neurons into neural systems. Problems range from investigation of the evolution of nervous systems in basal vertebrates to the application of neuroscience to education and law. Neuroscientists also seek to develop neurologically plausible models of human thinking, affect and behavior.

At the University of Notre Dame, the neuroscience and behavior major is an interdisciplinary program that includes both Bachelor of Science or Bachelor of Arts tracks. This description covers the BS track only (see the Arts & Letters section for description of the BA track). The core requirements for the major are essentially the same, including three foundational neuroscience and behavior Core courses, and an introductory neuroscience and behavior laboratory course beginning the fall of the sophomore year. In addition, all BS and BA students take a one-credit professional seminar during their first or second year on campus to explore opportunities within the major as well as varied career paths following graduation. The tracks differ in how they fulfill college and science elective requirements. Required courses and electives for both the BS & BA that will satisfy the major credit requirements are drawn from the Departments of Biological Sciences and Psychology, however disciplinary coursework draws on departments across the University. Undergraduate research is encouraged.

Research within the neuroscience and behavior program is reflective of the diversity of the field, with faculty pursuing research spanning from cellular and molecular approaches to architectural design and policy. Faculty are not housed within a specific department, but are affiliated based off their research interests; the uniting theme across disciplines is the understanding of the brain and behavior.

For students with a deep interest in research, a research honors program is available by application during the student's fall of junior year. The honors program consists of three semesters (junior year spring, senior year fall and spring) of writing intensive professional research development. A robust research proposal is crafted during the junior year spring, and the senior year seminars support the development and writing of the student's senior thesis. Completion of the research honors track is designated on the student's transcript.

NSBH B.S. SAMPLE CURRICULUM
Assumes NO language placement or AP credit

FALL	SPRING
First Year:	
BIOS: Big Questions w/ lab (BIOS 10171/11173)	BIOS: Molecules to Ecosystems w/ lab (BIOS 10172/11174)
CHEM 10171/11171 (Univ Core 2)	CHEM 10172/11172 (Univ Core 3)
MATH 10350 or 10550 (Univ Core 1)	MATH 10360 or10560
Univ 4 Core (USEM*)	WR13100
The Moreau Program	
	NSBH 20010 Prospectives on the NSBH major
Credit total: 16	**16**
Sophomore:	
NSBH Core 1: NSBH 20450 and 21450	NSBH Core 2: NSBH 30520 Intro to Cog Neuro
CHEM 20273 and 21273	NSBH Core 3: NSBH 30301 Molecular Neuro
Intro Psych (Univ Core 5)	Statistics (ACMS 20340 or BIOS 40411)
Theology 1	Foundational Science elective (1)
Philosophy 1	Language
Credit total: 17	**16.5–17**
Junior:	
PHYS 20210 and 21210	PHYS 20220 and 21220
NSBH Disciplinary elective (1)	NSBH Disciplinary elective (2)
Foundational Science elective (2)	NSBH Disciplinary elective (1)
Univ Core (6)	Theology 2
Language	Language
Credit total: 16	**16**
Senior:	
NSBH Integration/Application elective (1)	NSBH Supporting elective (3)
Philosophy 2	NSBH Supporting elective (4)
NSBH Supporting elective (2)	free elective
NSBH Supporting elective (2)	free elective
free elective	free elective
Additional life sciences lab	Moreau Senior Capstone (1)
Credit total: 16	**16**
Total credits as shown: 128.5	*Credits for degree = 124*

Students choosing an undergraduate major in neuroscience and behavior are well prepared for admissions to medical school, physical therapy or other professional schools, or to continue on for graduate study (e.g., Ph.D., M.D./Ph.D., M.S., MPH). Graduates who wish to enter the work directly from their undergraduate studies are desirable candidates in careers ranging from industry, biotechnology, biotechnology sales, health-related research, health-related consulting, government, education, or policy.

This major requires a minimum of 61 credits in the College of Science. Students should discuss their specific choices with the program's undergraduate adviser.

BACHELOR OF SCIENCE WITH A MAJOR IN NEUROSCIENCE AND BEHAVIOR

All neuroscience and behavior majors (BS track) take the following courses in science:

Mathematics (MATH 10350 or 10550 or 10850) and (MATH 10360 or 10560 or 10860)

General Chemistry (CHEM 10171/11171 or 10181/11181)

Organic Chemistry (CHEM 10172/11172 or 10182/11182) and (CHEM 20273/21273 or 20283/21283)

Physics (PHYS 10310/11310 or 20210/21210 or 10411/11411) and (PHYS 10320/11320 or 20435/21435 or 20220/21220)

Biology I: Big Questions & lab (BIOS 10171/11173)

Biology II: Molecules to Ecosystems & lab (BISO 10172/11174)

Intro to Cognitive Neuroscience (NSBH/PSY 30520)

Molecular Neuroscience (NSBH/CHEM 30301)

Perspectives on the NSBH major (NSBH 20010)

Neuroscience and Behavior Lecture and Lab (NSBH 20450/21450)

One additional lab in Biological Sciences (genetics, cell bio, physiology accepted; others with prior approval)

All majors to choose an additional 2 courses from the foundational science elective choices below:

Chemistry Accross the Periodic Table—CHEM 20274/20284

Genetics—BIOS 20250/21250 (taken together) or 20303

Cell Biology—BIOS 20241 or 30341

Biocomputing—BIOS 30318 with 32318

Biochemistry—CHEM 40420

Scientific computing—ACMS 20210

Intro Appl Math Methods I—ACMS 20550

Intro Dynamical Syst for Sci—MATH 20480

Intro to Math Reasoning—MATH 20630

Exp Psych II: Research Methods—PSY 30160

All neuroscience and behavior majors must take Intro to Psychology on campus, regardless of AP score. Either PSY 10000 or PSY 20000 can also be applied as a student's WKSS University Core requirement.

In addition, all neuroscience and behavior majors take at least one course in statistics:

ACMS 20340 or BIOS 40411

All majors to take an additional 24 credits of NSBH electives, distributed in the following ways. At least 9 credits of approved NSBH Disciplinary Specific Electives. At least 3 of approved NSBH Integration/Application Electives. Up to 12 credits of approved NSBH Supporting Electives, with up to 6 credits of undergraduate research (with approved faculty advisors) are able to count towards the Supporting Elective credit total. For a list of affiliated faculty, please see: https://neuroscienceandbehavior.nd.edu/people/?

The major allows significant flexibility, directed by interests and career goals. The semester map provided in the Bulletin is one curricular example of many, and students are urged to discuss their personal plans with the undergraduate advisor. The acronym "NSBH" refers to neuroscience and behavior elective choices pre-approved for the major.

COURSE DESCRIPTIONS

For a list of approved courses, please visit the neuroscience and behavior major's curriculum webpage at: https://neuroscienceandbehavior.nd.edu/about/curriculum/ A list of current elective options for Disciplinary, Integration/Application and Supporting Electives can be found on the same curriculum page through the "List of Electives" link. With any additional questions, please contact Nancy Michael (nmichael@nd.edu), Director of Education for the neuroscience and behavior major in the College of Science.

Physics and Astronomy

Chair:
Morten Ring Eskildsen
Director of Graduate Studies:
Anna Simon-Robertson
Director of Undergraduate Studies:
Philippe Collon
Frank M. Freimann Professor of Physics:
Michael C.F. Wiescher
Aurora and Tom Marquez Professor of Physics of Complex Quantum Matter:
László Forró
Frank M. Freimann Professor of Physics:
Ani Aprahamian
Frank M. Freimann Assistant Professor of Physics:
Badih Assaf
Tom and Carolyn Marquez Assistant Professor of Physics:
Yuhsin Tsai
Professors:
Dinshaw Balsara; Daniel Bardayan; Philippe Collon; Mark A. Caprio; Antonio Delgado; Umesh Garg; Peter M. Garnavich; Michael D. Hildreth; Christopher Hinkle (concurrent); J. Christopher Howk; Boldizsár Jankó; Colin Jessop; Masaru Kuno (concurrent); Kevin P. Lannon; Craig S. Lent (concurrent); John M. LoSecco; Adam Martin; Grant Mathews; Sylwia Ptasinska; Morten Ring Eskildsen; Rebecca Surman; Zoltán Toroczkai; Mitchell R. Wayne
Associate Professors:
Tan Ahn; Maxime Brodeur; Dervis Can Vural; Manoel Couder; Justin Crepp; Laura Fields; Nirmal Ghimire; Dafei Jin; Evan Kirby; Jeffrey Peng (concurrent); Anna Simon-Robertson
Assistant Professors:
Jeffrey Chilcote; Kateryna Foyevtsova; Yi-Ting Hsu; Edwin Huang; Xiaolong Liu; Marc Osherson; Petr Stepanov; Ragnar Stroberg; Lauren Weiss
Teaching Professor:
David Robertson
Associate Teaching Professors:
Matt Becker; Jenna Smith
Assistant Teaching Professors:
Corinne Deegan; Will Zech
Professor of the Practice:
Phillip Sakimoto
Associate Professor of the Practice:
Keith Davis; Arielle Phillips

Program of Studies. Physics is the study and description of the structure and behavior of the physical universe. As such, it is fundamental to all physical sciences, pure and applied. A knowledge of physics is basic to an understanding of astronomy, chemistry, geology and even biology in that physics contributes to the interpretation and detailed description of many of the natural phenomena which constitute the proper subjects of investigation in these sciences.

In addition to the undergraduate curricula, the Department of Physics offers programs for graduate study leading to the degrees of master of science and doctor of philosophy, as described in the *Graduate School Bulletin of Information.*

BACHELOR OF SCIENCE WITH A MAJOR IN PHYSICS

Science undergraduates may choose from two different majors within the Department of Physics: physics, and physics-in-medicine. The course sequences in these two programs are designed to accommodate the academic and professional interests of the majority of physics majors.

The basic physics major is a particularly flexible option for students, and is the one that will be chosen by the majority of undergraduates majoring in the department. Students following the physics major program will gain a broad understanding of physics. Depth is gained through the addition of one or more supplemental concentration programs offered through the department. Two of these concentration programs, **advanced physics** and **astrophysics,** help to prepare the student for graduate work in physics and astronomy or astrophysics. Students with interests in other areas have time to explore second-major, minor, or concentration options offered through departments in the College of Arts and Letters. Students with alternative interests are encouraged to discuss these with the director of undergraduate studies.

The **physics-in-medicine** major is designed for those students planning to attend medical school after completion of their degree, or who intend to work or study in the fields of biophysics or biomedical technology. The degree contains a core set of requirements in physics, augmented with courses in organic chemistry, biochemistry, biology, and biophysics.

No supplemental concentration is required of physics majors, but interested students are allowed and encouraged to follow as many concentrations as their schedules and interests allow. Students following the physics-in-medicine major program are not allowed to add concentrations; their major program is designed to accommodate the special interests of students intending careers in medicine, medical technology, or biophysics.

Physics as a second major is an option for students in the colleges of engineering, arts and letters, or business.

Requirements for the Physics Major
A total of 60 credits in science and mathematics is required for the physics major. The following outlines the course requirements:

Physics A: Mechanics (PHYS 10411[1])

Physics B: E&M (10422[2])

Physics C: Thermo & Relativity (20433)

Physics D: Modern (20444)

Intro to Chemical Principles (CHEM 10171[3]) and General Chemistry Biological Processes (CHEM 10122[3])

Calculus I, II, III (MATH 10550,[4] 10560,[4] 20550[4])

Intro to Circuitry and Electronics (PHYS 20430)

Sophomore Seminar (PHYS 23411)

Mathematical Methods in Physics I, II (PHYS 20451, 20452)

Intermediate Mechanics (PHYS 20454)

Electricity and Magnetism (PHYS 30471)

A Modern Physics Course
Particle Physics & Cosmology (PHYS 50602) or Intro to Solid State Physics (PHYS 50501) or Intro to Nuclear Physics (PHYS 50701)

Modern Physics I Laboratory (PHYS 41441)

Thermal Physics (PHYS 30461)

Quantum Mechanics I (PHYS 40453)

Physics majors may add as many of the following concentrations as their interests and schedules allow. Completion of these concentrations is indicated on the student's final transcript.

Concentration in Advanced Physics
The following outlines the course requirements (totaling 14 credits) for the advanced physics concentration:

Junior Seminar (PHYS 33411)

Electromagnetic Waves (PHYS 30472)

Quantum Mechanics II (PHYS 40544)

Senior Seminar (PHYS 43411)

Modern Physics II Laboratory (PHYS 41442) or 40000-level ACMS or MATH level elective

40000-level or above physics course or 3 credits of undergraduate research.

** electives must be different than the one chosen for student's core elective and can be fulfilled by research.*

Concentration in Astrophysics
The following outlines the course requirements (totaling 14 credits) for the astrophysics concentration:

Junior Seminar (PHYS 33411)

Intro. Astronomy and Astrophysics M (PHYS 20481)

Modern Observational Techniques (PHYS 50481)

Senior Seminar (PHYS 43411)

Physics of Astrophysics (PHYS 50201)

Relativity: Special and General (PHYS 50472)

Concentration in Applied Physics
The requirements are that the student completes at least 15 credits of engineering courses, chosen with the aid of the Director of Undergraduate Studies.

Requirements for the Physics-in-Medicine Major
A total of 77 credits in science and mathematics is required for the physics-in-medicine major. Physics-in-medicine majors cannot add another concentration as that degree is considered a concentration. They are encouraged to take any of the concentrations courses if they so wish. The following outlines the course requirements:

Physics A: Mechanics (PHYS 10411[1])

Physics B: E&M (10422[2])

Physics C: Thermo & Relativity (20433)

Physics D: Modern (20444)

Intro to Circuitry and Electronics (PHYS 20430)

General Chemistry I–IV (CHEM 10171, 11171, 10172, 11172, 20273, 21273, 20274, 21274)[7]

Calculus I, II, III (MATH 10550[4], 10560[4], 20550[4])

Sophomore Seminar (PHYS 23411)

Mathematical Methods in Physics I, II (PHYS 20451, 20452)

Intermediate Mechanics (PHYS 20454)

Electricity and Magnetism (PHYS 30471)

Quantum Mechanics I (PHYS 40453)

Biology I, II (BIOS 10171, 11173, 10172, 11174)

Three specialized science electives (9 credits total) [6]

Requirements for Physics as a Second Major
The requirements for physics as a second major, for students in the colleges of engineering, arts and letters or business, consists of the physics and mathematics courses listed above for the physics major, except the chemistry sequence. To list physics as a second major on the transcript, the student must satisfy all of the requirements for a major in some department and college of the university.

Sample Curricula

MAJOR: PHYSICS

First Year

First Semester	
MATH 10550, 12550[9]	4
PHYS 10411, 11411	4
CHEM 10171, 11171	4
University Requirements	6
Moreau First-Year Seminar	1
	19

Second Semester	
MATH 10560, 12560	4
PHYS 10422, 11422	4
CHEM 10122 or 10172, 11172	3
University Seminar	3
University Requirement	3
	17

Sophomore Year

First Semester	
MATH 20550, 22550	3.5
PHYS 20433	3
PHYS 20430	1.5
PHYS 20451, 22451	3.5
PHYS 23411	1
Language[9]	4
	16.5

Second Semester

PHYS 20454	3
PHYS 20444	3
PHYS 20452, 22452	3.5
Language [9]	4
University Requirement	3
	16.5

Junior Year

First Semester

PHYS 30461	3
PHYS 30471	3
PHYS 40453	3
Language [9]	3
Elective	3
	15

Second Semester

[Semester Abroad]	
or	
University Requirements	6
Electives	9
	15

Senior Year

First Semester

Modern Physics Electives [10]	
PHYS 50501	3
PHYS 40441, 41441	3
University Requirement	3
Electives	6
	15

Second Semester

Modern Physics Electives [10]	
PHYS 50602, 50701	3
University Requirement	3
Electives	9
Moreau Senior Capstone	1
	16

MAJOR: PHYSICS CONCENTRATION: ADVANCED PHYSICS

First Year (See core physics major)
Sophomore Year (See core physics major)
Junior Year

First Semester

PHYS 30461	3
PHYS 30471	3
PHYS 33411	1
PHYS 40453	3
Language [9]	3
Elective	3
	16

Second Semester

[Semester Abroad]	
or	
PHYS 30472	3
PHYS 40454	3
Physics Elective	3
University Requirement	3
Elective	3
	15

Senior Year

First Semester

Modern Physics Electives [10]	
PHYS 50501	3
PHYS 40441, 41441	3
PHYS 43411	1
University Requirements	6
Elective	3
	16

Second Semester

PHYS 40442, 41442 or MATH/ACMS elective at 40000-level	3
Modern Physics Electives [10]	
PHYS 50502, 50701	3
University Requirement	3
Electives	6
Moreau Senior Capstone	1
	16

MAJOR: PHYSICS CONCENTRATION: ASTROPHYSICS

First Year (See core physics major)
Sophomore Year (See core physics major)

First Semester

MATH 20550, 22550	3.5
PHYS 20433	3
PHYS 20430	1.5
PHYS 20451, 22451	3.5
PHYS 20481	3
PHYS 23411	1
Language [9]	4
	19.5

Second Semester

(See core physics major)

Junior Year

First Semester

PHYS 30461	3
PHYS 30471	3
PHYS 30481 or PHYS 50201 [8]	3
PHYS 33411	1
PHYS 40453	3
Language [9]	3
	16

Second Semester

(See core physics major)

Senior Year

First Semester

Modern Physics Electives [10]	
PHYS 50501	3
PHYS 40441, 41441	3
PHYS 43411	1
PHYS 30481 or PHYS 50201 [8]	3
University Requirements	6
	16

Second Semester

Modern Physics Electives [10]	
PHYS 50602, 50701	3
PHYS 50472	3
Electives	6
University Requirement	3
Moreau Senior Capstone	1
	16

MAJOR: PHYSICS-IN-MEDICINE

First Year

First Semester

MATH 10550, 12550 [10]	4
PHYS 10411, 11411	4
CHEM 10171, 11171 [7]	4
University Requirement	6
Moreau First-Year Seminar	1
	19

Second Semester

MATH 10560, 12560	4
PHYS 10422, 11422	4
CHEM 10172, 11172 [7]	4
University Seminar	3
University Requirement	3
	18

Sophomore Year

First Semester [11]

BIOS 10171, 11174, 11173	4
MATH 20550, 22550	3.5
PHYS 20433	3
PHYS 20430	1.5
PHYS 23411	1
CHEM 20273, 21273 [7]	4
	17

Second Semester [11]

BIOS 10172, 11174	4
PHYS 20444	3
CHEM 20274, 21274 [7]	4
University Requirement	3
Language [9]	4
	18

Junior Year

First Semester

BIOS 20303 [6]	3
BIOS 30344 [6]	3
PHYS 20451, 22451 [11]	3.5
Language [9]	4
University Requirement	3
	16.5

Second Semester

BIOS 30341 [6]	3
PHYS 20454 [11]	3
PHYS 20452, 22452 [11]	3.5
University Requirement	3
Language [9]	3
	15.5

Senior Year

First Semester	
PHYS 40453	3
PHYS 30471	3
University Requirement	3
Electives	6
	15
Second Semester	
University Requirement	3
Electives	9
Moreau Senior Capstone	1
	13

Notes

1. Alternatively, PHYS 10310 and its laboratory and tutorial.

2. Alternatively, PHYS 10320 and its laboratory and tutorial.

3. Alternatives for CHEM 10171 and 10122 include CHEM 10171–10172 or CHEM 10181–10182 plus the associated laboratories and tutorials.

4. Honors Calculus I through III (MATH 10850, 10860, and 20850) may substitute for Calculus I to III.

5. Options include a 40000-level or above physics course, PHYS 48480 (Undergraduate Research: The student must take at least 3 credits in research with one advisor and the credits must be distributed over at least two semesters), or MATH 40480 (Complex Variables). Additional options are possible with approval of the Director of Undergraduate Studies. Physics electives cannot be double counted with requirements for the Astrophysics concentration.

6. Students take three from the following: CHEM 40420 (Principles of Biochemistry), BIOS 20303 (Fundamentals of Genetics), BIOS 30344 (Vertebrate Physiology), BIOS 30341 (Cellular Biology), PHYS 50401 (Physics of Cells).

7. Alternatives for CHEM 10171–10172 and 20273–20274 are CHEM 10181–10182 and CHEM 20283–20284.

8. PHYS 50481 (Modern Observational Techniques) is offered in the fall of odd years.

9. Assumes no AP credit or advanced placement.

10. One of these courses, minimum, must be taken (Fall or Spring).

11. Students that have available time due to AP credit should consider taking Math Methods, PHYS 20451, PHYS 22451 in the fall and PHYS 20452, PHYS 22452, and PHYS 20454 in the spring semester of the Sophomore year. This is strongly recommended.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Physics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

HONORS TRACK IN PHYSICS

The goal of this honors track is to give our most talented students an exceptional background in physics research. This track is open for both Physics majors and Physics in Medicine.

The track will accept physics majors in good academic standing as early as the spring of their sophomore year, who have identified their research advisor in the Physics Department and have already completed one semester of undergraduate research. Acceptance will be based on a research statement and transcript. At acceptance into the track a formal agreement will be set up between the student and the advisor.

To graduate with this honor, students will have to complete:
1. Typically at least three semesters and one summer of independent research either at Notre Dame or another university or research laboratory. Alternate research/internship venues and opportunities must be approved in advance by the DUS or Department Chair. Students are expected to apply for REU, COS-SURF or other summer funding as appropriate.
2. A substantial thesis that needs to be approved by the advisor (a manuscript submitted for publication can substitute only if the student has made substantial contributions to the work).
3. A presentation at a national or regional meeting, or at the Notre Dame COS-JAM conference.
4. Successful completion of all requirements for one of the physics concentrations, or completion of the physics in medicine degree.
5. A GPA of at least 3.33 in College of Science courses.

Thesis Requirements:
The final draft of the thesis will be written under the supervision of the advisor, and will be submitted by April I. Each thesis will be reviewed by one member of the Undergraduate Research Committee. If the thesis is not approved, a second committee member will read the thesis and confer. The students will be notified by April 15 if a rewrite is needed. The rewrite will be due May 1.

The thesis is intended to support and develop each student's independence, scientific communication skills, critical review skills, and understanding of their research in the context of the larger field. It will have the added benefit of helping students prepare for graduate applications and fellowships.

The student's transcript will carry the notation "Honors Physics" to distinguish it from the Glynn Family Honors Program. If the student is also in the Glynn Family Honors program, the thesis presented in that program could be considered for the Honors Track in Physics, but would need approval by the Physics Undergraduate Research Committee.

SUMMARY OF REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN PHYSICS

	Physics	*Physics in Medicine*
Mathematics	11.5	11.5
Physics	41.5	32.5
Chemistry	7	16
Biology	—	8
Science Electives	—	9
Language	Intermediate-Level	
WR 13100	3	3
Philosophy*	6	6
Theology*	6	6
History*	3	3
Social Sciences*	3	3
Literature/Fine Arts*	3	3
The Moreau Program	2	2
Free Electives	28.5**	11.5**
	124	124

** One of these courses must be a University Seminar.*

*** Assumes intermediate-level competency in language was achieved by taking two 4-credit courses at the introductory level and one 3-credit course at the intermediate level.*

Preprofessional Studies

Chair, Associate Dean and Faculty:
Rev. James K. Foster, C.S.C., M.D.
Associate Dean for Collegiate Sequence (Emeritus):
Sr. Kathleen Cannon, O.P.
Associate Dean, Advisor and Faculty:
Kathleen J.S. Kolberg, Ph.D.
Advisor and Faculty:
Kristian Lax-Walker, M.S.; Henry Vu, Ph.D.
Hillebrand Center Director and Faculty:
Dominic O. Vachon, M.Div., Ph.D.
Adjunct Professors:
Abigail Battjes D.O. ; Katharine Callaghan, M.D., M.P.A.; Alex Cantrell, M.D.; Janel Charlton, M.D.; Lindsey Connolly M.D.; Lynn A. Damitz, M.D., FACS; Paul V. Detrisac, M.D.; Marcus Engel, M.S.; Mark Fox, M.D.; Gary Fromm, M.D.; Matthew Hadad, M.D.; Rachel Rose M.S.N., R.N.-CPLC; Anton Salud, M.D., M.A.; Mark Sandock, M.D.; Stephen Trzeciak, M.D., M.P.H.; Robert D. White, M.D.; Brandon Zabukovic, M.D., M.P.A.

Program of Studies. The Department of Preprofessional Studies offers several programs in the two major sequences, namely the program sequence in science preprofessional studies (SCPP) and the programs in the collegiate sequence (SCCO, SCED). These majors include courses from each of the traditional science departments but do not include courses taught within the department. Departmental courses that concentrate on professional preparation can be used as general electives or count toward minors in Compassionate Care in Medicine or Science and Patient Advocacy.

SCIENCE PREPROFESSIONAL DEPARTMENT (SCPP)

Notre Dame has a long history of providing integrative biomedical curricula for those preparing for health professions training. We have had an emphasis on a broader and deeper education in both the sciences and humanities. Recently, those who plan to enter industry after graduation have turned to the department for a customizable integrative science curriculum to fit their needs. The largest major, Science Preprofessional, is designed to allow those seeking to enter any of the health professions or industry to customize their undergraduate education to fulfill the prerequisites for a variety of professional schools or acquire significant science background for consulting, pharmaceutical industry, and biotechnology.

Beyond science courses, there was a growing need for holistic preparation for a life in the health professions. Courses addressing clinical practice and health systems were planned within the department to meet the needs of holistic professional development for students from any major. As these course offerings grew they were formalized into the Compassionate Care in Medicine minor (see following section on the Hillebrand Center).

The Department also houses the Center for Health Sciences Advising. Information concerning preparation for admission to schools of medicine, dentistry, physician assistant, optometry, podiatry, pharmacy, physical therapy, occupational therapy, public health, and post-baccalaureate nursing, as well as information on several other allied health careers, is available for all majors from the Center for Health Sciences Advising, 219 Jordan Hall of Science.

MAJOR IN SCIENCE PREPROFESSIONAL STUDIES

Science Preprofessional Studies is a 64-credit-hour integrative science major. The major requires 40 credit hours of core science courses in Calculus, Physics, Chemistry, Organic Chemistry, and Physics paired with 24 credits of upper-level science courses. The major also requires a literature course for Liberal Arts 4. The majority of students in this major are preparing for graduate programs in the health professions, while a significant number plan to enter the industry after graduation. The major classes are taken during the school year, and only occasionally, with consultation with your advisor, should students take any of the major courses in the summer. The Notre Dame College of Science does not allow transfer of science courses with the exception of pre-approved courses through Notre Dame Global Programs.

For the SCPP biomedical track, students typically take upper-level coursework in physiology, cell biology, statistics, genetics, biochemistry, microbiology, anatomy, and more. Upper-level labs are optional and customized to the student's needs. Since research is vital to understanding the work and methodology of science, up to 6 credit hours of research in a College of Science department can be applied to the major. Students are encouraged to use their general elective credits (24 or more credits after satisfying the major and University and College core requirements) to develop a secondary expertise in the humanities, social sciences, or professional development courses in Compassionate Care in Medicine or Science and Patient Advocacy.

Those preparing for an industry career can customize the upper-level coursework for their needs and typically take statistics, biochemistry, cell biology, scientific computing, immunotherapy, microbiology, dynamic models in biology, geographic information systems, stem cells and regenerative medicine, pharmacology, chemistry in service to community, or chemistry of fermentation and distillation, among others. These students will often prepare for their professional skills outside the STEM background by adding a minor from the Mendoza College of Business, such as Innovation & Entrepreneurship, Foundations of Business, or Marketing.

PREPROFESSIONAL SCIENCE SEQUENCE

(124 semester hour credits; 64 science hour credits minimum)

First Year

First Semester	
Writing	3
MATH 10350 Calculus I	4
CHEM 10171 Chemical Principles I	4
University Requirement*	3
University Requirement*	3
Moreau First-Year Seminar	1
	18

Second Semester	
Philosophy or Elective	3
MATH 10360 Calculus II	4
CHEM 10172 Organic Chemistry I	4
Literature	3
University Requirement*	3
	17

Sophomore Year

First Semester	
CHEM 20273 Organic Chemistry II	4
BIOS 10171 General Biology I	3
BIOS 11173 General Biology I Lab	1
Elective(s)	3–6
Language	3
	14–17

Second Semester	
CHEM 20274 General Chemistry II	4
BIOS 10172 General Biology II	3
BIOS 11174 General Biology II Lab	1
Elective(s)	3
Language	3
	14

Junior Year

First Semester	
Science Elective	3
PHYS 20210 Physics for Life Sciences I	4
Language or Elective	3
University Requirement	3
Science Elective	3
	16

Second Semester	
Science Elective	3
Science Elective	3
PHYS 20220 Physics for Life Sciences II	4
Electives	6
	16

Senior Year

First Semester	
Science Elective	3
Science Elective	3
University Requirement	3
University Requirement	3
Elective	3
	15

Second Semester	
Science Elective	3
University Requirement	3
Elective	3
Science Elective	3
Moreau Senior Capstone	1
	13

** One of these courses must be a University Seminar for those who start Notre Dame as First Year students; transfer students are exempt from the University Seminar.*

Notes:

1. Students who have completed only seven hours of mathematics in the first year of studies may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 10360, or MATH 10550, 10560. Students who have taken MATH 10250 may do this by taking MATH 10360, while those who have taken only one semester of MATH 10150 should take both MATH 10350 and 10360. Those students should also see the discussion on degree credit found later in this section of the Bulletin. With the increased emphasis on Statistics, students should also plan to take a Statistics course as a science elective and for those with AP credit for MATH 10550/10560 the Statistics course will also fulfill their University Requirement for Quantitative Reasoning.

2. All students who have had previous exposure to language will be required to take a placement examination in that language for placement in the proper course if the student wishes to continue in that language for the college requirement. If a student wishes to take a new language, they must, of course, start from the beginning. Spanish is encouraged.

3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–21210.

4. Well-developed communication skills are essential in healthcare and patient safety, and in industry. Health professions schools require training in written communication, and employers expect high-level writing skills. With this in mind, the SCPP major will require a Literature course taught in English, which will also fulfill the University Liberal Arts Requirement 4.

5. Behavioral and social issues have a profound impact on health, and as a result, effective healthcare provision and health professions schools have increased their requirements for training in the social sciences. Industry operates inside the parameters of the social sciences. Students should plan on taking courses in psychology, sociology, or anthropology for health professions and economics for industry. One of these courses may also fulfill University Liberal Arts Requirement 5.

6. Undergraduate Research (e.g. BIOS 48498, CHEM 48498), Teaching Practicum (e.g. BIOS 37491), and Directed Readings (BIOS 48497) may count toward the 24 credits of Science Electives with limits. Undergraduate Research and Teaching is limited to a total of six combined credit hours. Credits above these numbers will be counted in General Electives. Directed Readings are limited to 3 credit hours total.

7. Interested parties may obtain additional information including various statistics, from the department Web page. See preprofessional.nd.edu.

Summary of Requirements for the Degree of Bachelor of Science in Preprofessional Studies

	Credits
Biological Sciences	8
Chemistry	16
Mathematics	8
Physics	8
Language, Intermediate-level Competency	**11
University Requirements	21
The Moreau Program	2
Science Electives	24
General Electives	**25
	124

** One of these courses must be a University Seminar.*

*** Assumes Intermediate-level Competency in Language was achieved by taking two four-credit and one three-credit courses.*

HILLEBRAND CENTER FOR COMPASSIONATE CARE IN MEDICINE

As part of the Department of Preprofessional Studies, the Ruth M. Hillebrand Center for Compassionate Care in Medicine has the mission of advancing the scientific theory and evidence-based practice of compassionate care in healthcare and of promoting effective communication skills in physicians, nurses, and allied health professionals. The Center offers courses, programs, and research opportunities to help students gain a scientific and humanistic understanding of the importance of compassionate caring in all patient care as well as an introduction to preventing burnout and promoting personal well-being in the health professions. Students can also be involved in research on the integration of compassionate care in clinical practice.

The following elective courses are regularly offered:

Medical Counseling Skills and Patient-Centered Medicine

Science of Compassionate Care in the Medical Professions

Introduction to Clinical Ethics

Psychology and Medicine

Film and the Physician

Introduction to the American Healthcare System

Spiritualities of Caring in the Helping Professions

Introduction to Personalism in Medicine: The Pathos Project

Introduction to Hospice and Palliative Care

MINOR IN COMPASSIONATE CARE IN MEDICINE

The Minor in Compassionate Care in Medicine (MCCM) provides interdisciplinary training in the science and sustainable practice of compassionate care for future health professionals. The minor is rooted in the biology, neuroscience, and psychology of compassion as it is practically applied to the effective and sustainable care of the sick. The practice of compassionate care not only improves patient outcomes, but also sustains the well-being of the healthcare provider, reducing clinician burnout.

Program Requirements (15 credit hours):

Program includes a required gateway course, approved didactic electives, experiential learning or practical skills training courses (e.g., service learning, community-based research; medical counseling skills), and a capstone project.

- Gateway Course (3 credits): SCPP 30405 Compassionate Care in the Medical Professions
- Electives (6 credits): Two courses are required from the list of approved electives in the areas of biology, neuroscience, psychology, ethics, and policy/social justice in medicine.
- Experiential/Skills-Based Courses (total of 3 credits required): Students may satisfy the experiential learning requirements by taking a total of three credit hours of learning through a combination of approved 1-credit seminars, or an active-learning based 3-credit Medical Counseling Skills course.
- Capstone Project (3 credits): The Capstone Project can be satisfied through a Directed Readings course (i.e., SCPP 46397-06 Directed Readings), or another pre-approved course. For all options, students will be required to complete a 20-page paper integrating the courses and experiences of the CCIM minor. The Capstone Project must be pre-approved by the Director.

To enroll or discuss an interest in the program, please schedule a consultation with Dominic Vachon M.Div., Ph.D., the John G. Sheedy, MD Director of the Hillebrand Center, at dvachon@nd.edu.

COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at classsearch.nd.edu. The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Science Preprofessional.* Course descriptions can be found by clicking on the subject code and course number in the search results.

COLLEGIATE SEQUENCE PROGRAMS

The collegiate sequence programs, science-computing and science-education, were instituted in 1987. These programs allwo students to obtain a strong science background while simultaneously preparing them for professions in health care, computing, or education.

SCIENCE-COMPUTING COLLEGIATE SEQUENCE

The science-computing collegiate sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates courses from the four basic areas of science along with a sequence of computing courses. The program will give the student working knowledge of various computer languages and experience using current computer technology. By choosing science electives appropriately, the student has the option of focusing in an area in science of particular interest. Graduates of this program earn a B.S. degree and are able to enter the scientific computing job market immediately upon graduation.

The other departments in the College of Science as well as the colleges of arts and letters and engineering provide all course instruction in the curricula of the Science-Computing Collegiate Sequence.

BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-COMPUTING

All science-computing majors take the following basic sequence of science courses:

General Biology (BIOS 10171–10172 and 11173 and 11174)[1]

CHEM 10171 and 11171, 10172 and 11172 and two of (CHEM 20273 and 21273, CHEM 20274 and 21274, SC 20110), CHEM 10122

Calculus (MATH 10350–10360 or 10550–10560)[1,2]

Physics (PHYS 20210–20220 and 21210–21220)[3]

Statistics (ACMS 20340 or BIOS 40411)

They also are required to take 20–21 credits of science elective,[4] completing a minimum of 64 credits of science courses.

They also are required to complete 14–15 credits in computing courses.

Please see advisor for information on possible sequences in computing.

Requirements for the program are summarized in the table on the following page.

Notes:

1. Equivalent or higher-level sequences in science may be substituted, e.g., MATH 10850–10860 for MATH 10550–10560.

2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 103600 or MATH 10550, 10560. Students having taken MATH 10250 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found later in this section of the Bulletin.*)*

3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20220.

SUMMARY OF MINIMAL REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN A COLLEGIATE SEQUENCE MAJOR

	Science-Computing	*Science-Education*
Biological Sciences	8	8
Chemistry	8	8
Organic Chemistry/Geology	8	8
Mathematics	8	8
Physics	8	8
Statistics: ACMS 20340 or BIOS 40411	3–4	0
Science Electives	20–21	20
Total Required Science	**64**	**60**
Computing Courses	14–15	0
Education Courses	0	33
Language	Intermediate Level Competency	
University Requirement	24	24
The Moreau Program	2	2
Free Electives	10**	0**
Total	124	128

* One of these courses must be a University Seminar.

** Assumes intermediate-level competency in language achieved by taking two 4.0-credit- and one 3.0-credit courses.

Students will take a 1-credit Moreau First-Year Seminar course during their first year and complete their 1-credit Moreau experience in their final year.

4. The choice by the student of the elective courses in science for the Science-computing program will be based on the student's scientific interest as developed during his or her studies of the four basic areas of science. Any major-level College of Science courses (i.e., those taken to meet science-major requirements and not those designated as "Recommended University electives") and that are not being used to fulfill other specific graduation requirements can be used to satisfy the "Science Elective" requirement. Major-level geology courses cross-listed as science courses may be taken as science electives. Students are restricted to no more than two credits per semester (six total) for science credits and three credits per semester (nine total) for graduation credit of courses such as Undergraduate Research or Directed Readings.

Suggested Curriculum for the Degree of Bachelor of Science in the Science-Computing Collegiate Sequence (124 semester hour credits: 64 science hour credits, minimum)

First Year

First Semester

CHEM 10171 and 11171	4
MATH 10550 Calculus (Note 2) or 10350	4
University Requirement	9
Moreau First Year Seminar	1
	18

Second Semester

CHEM 10172 and 11172	4
MATH 10560 Calculus or 10360	4
University Requirement	9
	17

Sophomore Year

First Semester

BIOS 10171 Biology I	3
BIOS 11173 Biology I Lab	1
CHEM 20273 and 21273 or SC 20110/21110	4
Language	3
CSE Course	4 (3)
	15 (14)

Second Semester

BIOS 10172 Biology II	3
BIOS 11174 Biology II Lab	1
CHEM 20274, 21274 (or CHEM 10122)	4 (3)
Language	3
Elective	3
	14 (13)

Junior Year

First Semester	
Science Elective	3
CSE 20211 Fundamentals of Computing	4
PHYS 20210, 21210 Physics for Life Sciences I	4
University Requirement	3
Elective (or Language)	3
	17
Second Semester	
BIOS 40411 Biostatistics or ACMS 20340 Statistics for Life Sciences	4 (3)
PHYS 20220, 21220 Physics for Life Sciences II	4
CSE Elective	3
University Requirement	3
	14 (13)

Senior Year

First Semester	
Science Electives	9
CSE Elective	4
Electives	3
	16
Second Semester	
Science Electives	9
CSE Elective	3
Electives	3
Moreau Senior Capstone	1
	16

** One of these must be a University Seminar.*

SCIENCE-EDUCATION COLLEGIATE SEQUENCE

The science-education collegiate sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates many courses from the four basic areas of science along with education courses that most states require to give the student the background necessary to receive a certificate to teach in a secondary education system. Information concerning the requirements for secondary education in the various states, as well as the general course requirements for a certificate necessary to teach science in a secondary education program, is available in the College of Science Advising Office, 319 Jordan Hall.

The other departments in the College of Science and the other colleges of the University, as well as the Education Department at Saint Mary's College, provide all course instruction in the curricula of the Science-Education Collegiate Sequence.

BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-EDUCATION

All science-education majors take the following basic sequence of science courses:

General Biology (BIOS 10171–10172 and 11173–11174) [1]

CHEM 10171 and 10172 and [CHEM 20273 and 21273, CHEM 20274 and 21274) or (CHEM 20273 AND 21273, ENVG 20110) OR (SC 20110, ENVG 20120)]

Calculus (MATH 10350–10360 or 10550–10560) [1,2]

Physics (PHYS 20210–20220) [3] and 21210, 21220

They also are required to take 20 credits of science electives,[4, 5] completing a minimum of 60 credits of science courses.

Also required for the major are the following education courses taught by Saint Mary's College:

EDUC 201 Teaching in a Multicultural Society

EDUC 220 Applied Media and Instructional Technology

EDUC 345 Curriculum and Assessment in the High School Setting

EDUC 346 Instructional Strategies and Classroom Management in the High School Setting

EDUC 350 Educational Psychology: Human Growth and Development of the Adolescent

EDUC 356 Educational Psychology: Educating Exceptional Learners

EDUC 449 Teaching Science in the Secondary School

EDUC 475 Student Teaching in the Secondary School (spring of senior year)

The education courses are those required in the State of Indiana but are also those that are required most often by the educational accrediting agencies of most states. The practical teaching experience which is required will also be arranged through the Education Department at Saint Mary's College.

Requirements for the program are summarized in the table above.

Notes:

1. Equivalent or higher-level sequences in science may be substituted, e.g., MATH 10850–10860 for MATH 10550–10560.

2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 10360 or MATH 10550, 10560. Students having taken MATH 10250 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found in this section.)

3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 20210–20220.

4. The choice by the student of the elective courses in science for the Science-education program will be based upon the requirements and list of courses suggested by the various state educational systems. Since the timing of the course work is particularly constrained for this major, the student should work closely with his or her advisors: an associate dean in the College of Science and an assigned advisor in the Education Department at Saint Mary's College.

5. Any major-level College of Science courses (i.e., those taken to meet science-major requirements and not those designated as "Recommended University electives") and that are not being used to fulfill other specific graduation requirements can be used to satisfy the "Science Elective" requirement. Major-level geology courses cross-listed as science courses may be taken as science electives. Students are restricted to no more than two credits per semester (six total) for science credits and three credits (nine total) for graduation credit of courses such as Undergraduate Research or Directed Readings.

Suggested Curriculum for the Degree of Bachelor of Science in the Science-Education Collegiate Sequence (124 semester hour credits: 60 science hour credits, minimum)

First Year

First Semester	
CHEM 10171 and 11171	4
MATH 10350 or 10550 Calculus (Note 2)	4
University Requirement	9
Moreau First-Year Seminar	1
	18
Second Semester	
CHEM 10172 and 11172	4
MATH 10360 or 10560 Calculus	4
Elective*	3
University Requirement	9
	17

Sophomore Year

First Semester	
BIOS 10171 Biology I	3
BIOS 11173 Biology I Lab	1
SC 20110 Planet Earth / 21110 or CHEM 20273 and 21273	4
Language	3
Education 201F (SMC)	3
Elective	3
	17
Second Semester	
BIOS 10172 Biology II	3
BIOS 11174 Biology II Lab	1
CHEM 20274 and 21274, or CHEM 10122	4 (3)
Language or Elective	3
Fine Arts/Literature	3
EDUC 220 (SMC)	3
	17 (16)

Junior Year

First Semester

PHYS 20210, 21210 Physics for Life Sciences I	4
Science Electives	6
EDUC 345 (SMC)	3
EDUC 356 (SMC)	3
	16

Second Semester

PHYS 20220, 21220 Physics for Life Sciences II	4
Science Electives	8
EDUC 350 (SMC)	3
EDUC 346 (SMC)	3
	18

Senior Year

First Semester

Science Electives	6
EDUC 449 (SMC)	3
University Requirement	6
	15

Second Semester

EDUC 475 (SMC)	12
Moreau Senior Capstone	1
	13

** One of these must be a University Seminar*

Special Programs

DOUBLE MAJORS IN SCIENCE

In certain instances, students have the option of pursuing majors in two departments in the College of Science. Combinations that are normally approved include: Biological Sciences with Chemistry; Biological Sciences with Mathematics; Biological Sciences with Physics; Biochemistry with Mathematics; Biochemistry with Physics; Chemistry with Mathematics; Chemistry with Physics; Environmental Sciences (first major) with Mathematics; Mathematics with Physics; and Science Computing, Science Education with supplementary major in ACMS or Statistics. Examples of combinations that are normally forbidden include: Preprofessional Studies with any other science majors, Collegiate Sequence majors (Science Computing, Science Education) with any other science majors except supplementary majors in ACMS and Statistics, parallel subprograms such as Mathematics and Life Sciences with Physics-in-Medicine and either of those with Biological Sciences or Biochemistry, any majors among Mathematics, ACMS and Statistics. All requirements of each major must be met, with no exceptions. Failing to complete a required course terminates that major for a student. Every student who wishes to major in two departments in the College of Science must prepare an agenda of specific courses to be taken, which both advisors and the dean must approve. This should be done as early as possible, but absolutely no later than the seventh day of the senior year. In certain instances, a student may possibly receive approval of a normally forbidden combination of majors, but only if a specific program has been set up by the seventh day of the sophomore year.

All double major programs in science are extremely challenging programs that require that the student take four or five science courses at a time. Thus, only students of superior scholastic ability should consider this as an option.

Students are warned that it is almost certain that completing a double major in two sciences will require total credits well over the college minimum of 124. Conflicts in scheduling of required courses may occur; neither the college nor the departments undertake to reschedule courses for the sake of double majors. For these reasons, it must be emphasized that completing a double major may well require more than four years. Only one degree is awarded (degrees in science do not specify a field).

Dual Degree Program with the College of Engineering

Please refer to the *Bulletin* section under the heading "College of Engineering."

Dual Degree Program with the Mendoza College of Business

Coordinators:

Neil Mangus
Director of Admissions
Master of Business Administration Program

J. Daniel Gezelter
Senior Associate Dean, College of Science

Program of Studies. The dual degree five-year program in the Mendoza College of Business and the College of Science enables the student to earn the master of business administration and bachelor of science degrees in a major in one of the five undergraduate departments in the College of Science.

This program, instituted in 1994, offers students the opportunity to better integrate studies in science and in management. The student completing this program will have a background in management as well as the first professional degree in one of the undergraduate majors of the College of Science. Because it is a demanding program, only those students of superior scholastic ability who have the aptitude, motivation and maturity necessary for the combined graduate and undergraduate program should apply. Those with outstanding internship experiences in business will be looked upon favorably. Advisors for the program are available for consultation about the advisability of applying for the program and about meeting the particular needs of students pursuing this program.

The program is open only to those currently enrolled Notre Dame students who have completed three years of an undergraduate science first major. Students interested in making application for the MBA/Science program should apply to the MBA program during their junior year. They should take the GMAT by December of their junior year. All candidates must schedule a personal interview as a part of the MBA admissions process. Students must also declare their intentions to the dean's office in the College of Science and request that a dean's eligibility letter be sent to the MBA Office for them.

An applicant who is not admitted to the dual degree MBA/Science program continues in the undergraduate program and completes his or her science major in the usual four-year period.

As a general guide, it is expected that a student accepted to this program will take two courses for the undergraduate degree during the summer session

following his or her junior year. Every dual-degree student is also expected to participate in the orientation for the MBA program. This program will occupy the entire day for the two weeks prior to the first day of classes. Orientation is mandatory for all students beginning the MBA program.

Students in the five-year science/MBA program are also required to:

(1) Complete a minimum of 48 MBA credit hours and maintain a GPA of at least 3.0 to successfully complete the program.
(2) Take all MBA courses in their fourth yeaer.
(3) Maintain full-time student status (minimum courseload of 12 credit hours per semester). Credit hours can come from science or MBA programs.

The MBA curriculum divides each semester into two modules. In addition to the courses required to complete undergraduate and University requirements, students must complete the following MBA course work:

Summer Session Following Junior Year:	
Math Review Workshop*	0
Accít Review Workshop*	0
(Science Undergraduate Requirements	*6)*
Senior Year—*(Science Undergraduate Requirements Each Semester*	3–7)
First Semester, Module 1:	
ACCT 60100. Financial Accounting	2
MBET 60340. Conceptual Foundation of Business Ethics	2
MGT 60100. Statistics	2
MGT 60300. Organizational Behavior	2
First Semester, Interterm Week:	
Professional Development Seminar	0
Communications Seminar++	1
First Semester, Module 2:	
ACCT 60200. Cost Accounting	2
FIN 60400. Finance I	2
FIN 60210. Microeconomic Analysis	2
MARK 60100. Marketing Management	2
Second Semester, Module 3:	
FIN 70600. Finance II	2
FIN 60220. Macroeconomic Analysis	2
MGT 60900. Strategic Decision Making	2
Free Elective	2
Second Semester, Interterm Week:	
Values in Decision Making	1
Elective Course	1
Second Semester, Module 4:	
MGT 60400. Leadership and Teams	2
MGT 60700. Operations Management	2
Fifth Year—*(Science Undergraduate Requirements Each Semester*	3–7)
First Semester, Module 1:	
MGT 60200. Problem Solving	2
Management Communication Elective I	2
Free Elective*	2
Interterm Week:	
OPTIONAL: Two one-credit-hour electives (TBD) OR Corporate Case Studies OR Offshore Program: China or Brussels	2
First Semester, Module 2:	
Ethics Elective	2
Management Communication Elective II	2
Second Semester, Module 3:	
Free Electives	4
(Floating Optional Elective	2)
*Students have the option to take one additional two-credit-hour elective now or in any remaining module.	
Second Semester, Interterm Week:	
(OPTIONAL: Two one-credit-hour electives OR Corporate Case Studies OR Offshore Program: China or Brussels	2)
Second Semester, Module 4:	
Free Electives	4
(Floating Optional Elective	2)

+See "Arts and Letters Core" on the first page of the College of Engineering section.

++Special one/two-week courses. All other MBA courses are seven weeks in length.

**Occurs during August Orientation*

Total for both degrees: 126–132 undergraduate, 48 MBA

Students involved in the MBA/Science program will complete their undergraduate program while completing MBA requirements. MBA course work will not apply to the undergraduate degree. Sample schedules for particular majors are available from advisors or the dean's office. Students who are behind in the completion of their major requirements are strongly recommended to obtain permission and advising before applying to the joint program.

Science Degree Credit

Courses are generally taken in the College of Science for one of three reasons: (1) for students in either the College of Arts and Letters, or the Mendoza College of Business, the Keough School, or the School of Architecture, to fulfill a University requirement; (2) for students in either the College of Engineering or the College of Science to fulfill a college requirement; and (3) for students in the College of Science, to fulfill a major requirement. As a result, the College of Science offers different sequences of courses which overlap considerably in content but not level. Thus it is possible for a student who has changed his or her college or major to have taken two courses which overlap in content. Both courses will appear on the student's transcript, but only one will count for degree credit.

As a guideline for the student and the student's advisors, listed below are the groups of courses that overlap considerably in content. (Courses within the same group are shown in the same row and are also enclosed within parentheses; courses listed within the same column generally show a typical normal progression through course work.) In every case, only one course per group should be counted for degree credit. Generally, only the course taken last should be counted. Students and advisors are warned not to use these groups when moving between course sequences but rather to seek advice from the offering department or the Associate or Assistant Dean in the College of Science Dean's office.

For overlap with courses no longer taught in the year of publication of this *Bulletin,* please refer to previous editions of this *Bulletin.*

Credit is not given for both ACMS and MATH courses with the numbers 10140, 10150, 20210, 20340, 20610, 20750, 30440, 30530, 30540, 30610, or any course cross-listed between ACMS and MATH. In the following table the restrictions on MATH courses numbered 10140 and 20340 also apply to the ACMS courses with the same numbers.

Science Degree Credit

(10260 10270 10360 10560 / 19561 / 19562 / 19563 / 10092 / ACMS 10560)

Applied and Computational Mathematics and Statistics							
(10140 10145/10091	20340		BIOS 40411	30540	30550	MATH 30540)	
(	20210	20220	ITAO 20210)				
(	20620		MATH 20610	MATH 20580	MATH 24580)		
(	20550		PHYS 20451)				
(				30530	MATH 30530)		
(				30610	MATH 30610)		
(	20750	MATH 20750	PHYS 20452)				
Biological Sciences							
(10101/10091 10110	10156			10191	10161/10171/10098/20201)		
(10107/10097 10118	10155				10162/10172/10099/20202)		
(		20241	30341)				
(		20250	20303)				
Chemistry and Biochemistry							
(10101/10091					10171/10097	10181)	
(10102			10122)				
(					10176	10172	10182)
(						20273	20283)
(						20274	20284)
(			40420	30341	60521)		
(				30342	60522)		
Mathematics							
(10120 10110)							
(10250/10090 10240		10350	10550/10091/ACMS 10550)				
(10260		10270	10360	10560/19561/19562/19563/10092/ACMS 10560			
(		20210	ACMS 20210)				
(		20480	20610	ACMS 20620	20580/10094	20810)	
(		20480	20610	ACMS 20620	20580/10094	20570)	
(			20750	ACMS 20750	30650)		
(ACMS 10140/10141/10145/10091		ACMS 20340	BIOS 40411	30540	ACMS 30540)		
(				30530	ACMS 30530)		
(				30610)			
(						40390)	
Physics							
(10111/10091 10310/10093		10411	30210/20210/10095)				
(10222/10092 10320/10094	10422		30220/20220/10096)				
(		20431	10424)				
(	20330		20464)				
(10052	20051	ENER 20201	STV 20304)				
(10140	20140)						
(20451	MATH 20570	MATH 20610	MATH 20580)				
(20452 MATH 20571	MATH 20750	MATH 30650)					

Note also that no degree credit is given to any students for MATH 10101; additionally, science majors will not receive degree credit for MATH 10120 or MATH 10110.

Officers of Administration

In the College of Science

STEVEN CORCELLI, Ph.D.
Interim Dean of the College of Science

J. DANIEL GEZELTER, Ph.D.
Senior Associate Dean for Education and Undergraduate Programs

KEVIN LANNON, Ph.D.
Associate Dean for Faculty Affairs

REV. JAMES K. FOSTER, C.S.C., M.D.
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Chair of the Department of Biological Sciences

STEVEN CORCELLI
Chair of the Department of Chemistry and Biochemistry

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DAVID GALVIN
Chair of the Department of Mathematics

MORTEN ESKILDSEN, Ph.D.
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Chair, Preprofessional Studies

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DAVID R. HYDE, Ph.D.
Kenna Director of the Center for Zebrafish Research

FRANCIS J. CASTELLINO, Ph.D.
Director of the W.M. Keck Center for Transgene Research

M. SHARON STACK, Ph.D.
Director of the Harper Cancer Research Institute

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Pawleys Island, South Carolina

DR. TANYA M. KNE
Tempe, Arizona

DR. ROBERT M. LEE
Bloomington, Illinois

MR. ROBERT L. LUMPKINS JR.
Nokomis, Florida

MR. JAMES C. MARCUCCILLI
Fort Wayne, Indiana

MR. LAWRENCE A. MASTROVICH
Trabuco Canyon, California

DR. JILL B. McCORMACK
Glen Ellyn, Illinois

MR. JAMES E. McGRAW
Kansas City, Missouri

DR. ANN HANK MONAHAN
Wayzata, Minnesota

MR. JAMES M. MORRISON
Valparaiso, Indiana

MS. ANNE S. MOSELEY
Buffalo Grove, Illinois

MR. CHRISTOPHER J. MURPHY
Omaha, Nebraska

DR. BRUCE M. NAKFOOR
Naples, Florida

DR. MAURICE J. NORMAN
Chicago, Illinois

MS. BARBARA O'CONNOR
San Carlos, California

DR. MIKE PARSEGHIAN
Tucson, Arizona

DR. JOHN G. PASSARELLI
Syosset, New York

MS. CATHLEEN REISENAUER
Morgan Hill, California

MR. RICHARD T. RILEY
Key Largo, Florida

DR. MICHAEL D. RYAN
Mequon, Wisconsin

MR. WILLIAM M. SHEEDY
San Mateo, California

MR. DENIS E. SPRINGER
Saint Charles, Illinois

DR. WILLIAM S. STAVROPOULOS
Naples, Florida

MR. DAVID L. TAICLET
Chesterfield, Missouri

DR. RAPHAELLE D. VALLERA
Dallas, Texas

DR. ELEANOR M. WALKER
Troy, Michigan

MS. KATIE O. WASHINGTON COLE
Chicago, Illinois

DR. ANN E. WEBER
Cranford, New Jersey

MRS. TERRI L. WELTER
Arlington, Virginia

DR. JOHN C. YORK II
Canfield, Ohio

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Faculty

The following is the official faculty roster for the 2025–26 academic year as of June 30, 2025. This roster includes faculty members who are on leave during the academic year. The date in parentheses at the close of each entry is the year the individual joined the Notre Dame faculty.

Ahmed Noman Abbasi. *Professor, IT, Analytics and Operations; Joe and Jane Giovanini Professor of Information Technology, Analytics, and Operations.* Bachelor of Science, Virginia Polytechnic Institute, 2001; Master of Business Admin, *ibid.,* 2004; Philosophiae Doctor, University of Arizona, 2008 (2020)

Hussein Ali Abdulsater. *Associate Professor, Classics; Director of the Middle Eastern and North African Studies (MENA) Program.* B Electrical Engineering, American University of Beirut, 2006; Master of Arts, *ibid.,* 2007; Master of Philosophy, Yale University, 2010; Philosophiae Doctor, *ibid.,* 2013 (2016)

Christopher Paul Abram. *Professor, English; Fellow, Medieval Institute.* Bachelor of Arts, University of Cambridge, 1998; Master of Philosophy, *ibid.,* 1999; Philosophiae Doctor, *ibid.,* 2004 (2013)

Nicole Louise Achee. *Research Professor, Biological Sciences.* Bachelor of Science, Saint Louis University, 1992; Master of Science, Texas A&M University, 1995; Philosophiae Doctor, Uniformed Services Health Sci., 2004 (2013)

Carl Bruce Ackermann. *Nolan Professorship for Excellence in Undergraduate Instruction; Teaching Professor, Finance.* Bachelor of Arts (Latin), Amherst College, 1984; Philosophiae Doctor, UNC at Chapel Hill, 2000 (1998)

Alvaro Fernando Acosta Serrano. *Professor, Biological Sciences.* Bachelor of Science, Univ Catolica Andres Bello, 1990; Philosophiae Doctor, Federal University of Sao Paulo, 1996 (2023)

David Acton. *Assistant Professor of the Practice, Raclin Murphy Museum.* Bachelor of Arts, University of Michigan, 1976; Master of Arts, *ibid.,* 1979; Philosophiae Doctor, *ibid.,* 1993 (2013)

Catherine Acitelli Adamo. *Assistant Teaching Professor, Applied Computational Math & Stats.* Bachelor of Science, North Carolina State Universit, 2012; Master of Science, *ibid.,* 2020 (2022)

Ellis Adjei Adams. *Associate Professor, Keough School of Global Affairs; Fellow, Klau Ctr. for Civil & Human Rights; Fellow, Kellogg Inst for Intrnl Studies; Fellow, Joan B. Kroc Inst. for Int'l. Peace; Fellow, Pulte Institute for Global Develpmt.* Bachelor of Science, Kwame Nkrumah Unv. of Sci.&Tec, 2007; Master of Science, Michigan Technological Univers, 2011; Philosophiae Doctor, Michigan State University, 2016 (2020)

Katrina Adams. *Assistant Professor, Biological Sciences; Elizabeth and Michael Gallagher Family Collegiate Assistant Professor in Adult Stem Cell Research.* Bachelor of Science, Univ. of California-San Diego, 2008; Philosophiae Doctor, Univ.of California-Los Angeles, 2014 (2023)

Yenupini Joyce Adams. *Associate Professor of the Practice, Eck Institute for Global Health; Fellow, Kellogg Inst for Intrnl Studies; Fellow, Pulte Institute for Global Develpmt.* BS in Nursing, Calvin College, 2012; Philosophiae Doctor, Michigan State University, 2016 (2022)

Michael Kwame Addo. *Fellow, Klau Ctr. for Civil & Human Rights.* LLB—Law, Ghana School of Law, 1981; Master of Law, University of Essex, 1984; Philosophiae Doctor, *ibid.,* 1987 (2020)

Muna Adem. *Assistant Professor, Sociology.* Bachelor of Arts, California St. Univ-Northridge, 2013; Master of Arts, Indiana Univ-Bloomington, 2017; Master of Science, *ibid.,* 2019; Philosophiae Doctor, *ibid.,* 2023 (2025)

Christopher Adkins. *Associate Teaching Professor, Management & Organization; Academic Director of Leadership Development.* Bachelor of Arts, Coll of William & Mary, 1995; Master of Arts, Boston University, 2001; Doctor of Philosophy, Coll of William & Mary, 2009 (2016)

Arun Agrawal. *Professor, Keough School of Global Affairs; Concurrent Professor, Biological Sciences; Director of the Notre Dame Just Transformations to Sustainability.* Bachelor of Arts, University of Delhi, 1983; Master of Business Admin, Indian Inst of Mgmt—Ahmedaba, 1985; Master of Arts, Duke University, 1988; Philosophiae Doctor, *ibid.,* 1992 (2025)

Trenton Clay Agrelius. *Assistant Teaching Professor, Biological Sciences.* Bachelor of Science, Augusta University, 2011; Master of Science, Univ of South Carolina, 2015 (2022)

Emiliano Aguilar. *Assistant Professor, History; Fellow, Kellogg Inst for Intrnl Studies.* Bachelor of Arts (Latin), Wabash College, 2015; Bachelor of Arts, *ibid.,* 2015; Master of Arts, Purdue University, 2017; Master of Arts, Purdue Univ North Central, 2017; Master of Arts, Northwestern University, 2020; Master of Arts, *ibid.,* 2020; Philosophiae Doctor, *ibid.,* 2022 (2022)

Pedro Aguilera-Mellado. *Associate Professor, Romance Languages and Literatures; Concurrent Assistant Professor, Film, Television, and Theatre; Director of Graduate Studies, Romance Languages and Literatures; Fellow, Nanovic Inst for European Studies; Fellow, Kellogg Inst for Intrnl Studies.* Bachelor of Arts, University of Granada, 2009; Master of Arts, *ibid.,* 2010; Master of Arts, University of Michigan, 2013; Philosophiae Doctor, *ibid.,* 2017 (2018)

Tan Ahn. *Associate Professor, Physics.* Bachelor of Science, SUNY at Stony Brook, 2002; Master of Science, *ibid.,* 2004; Philosophiae Doctor, *ibid.,* 2008 (2014)

Josephine Sarpong Akosa. *Assistant Teaching Professor, IT, Analytics and Operations.* Bachelor of Science, Kwame Nkrumah Unv. of Sci.&Tec, 2011; Master of Science, University of Texas at El Paso, 2014; Philosophiae Doctor, Oklahoma State University, 2018 (2019)

John Michael Aland. *Assistant Professor, Accountancy.* Bachelor of Business Admin., University of Notre Dame, 2009; Philosophiae Doctor, University of Michigan, 2021 (2023)

Maurizio Albahari. *Associate Professor, Anthropology; Concurrent Associate Professor, Romance Languages and Literatures; Fellow, Nanovic Inst for European Studies.* Bachelor of Arts, Universita Degli Studi, 2000; Master of Arts, Univ California Irvine, 2002; Philosophiae Doctor, *ibid.,* 2006 (2008)

Alex Himonas Alexandrou. *Professor, Mathematics.* Bachelor of Science, University of Patras, 1976; Master of Science, Purdue University, 1982; Philosophiae Doctor, *ibid.,* 1985 (1989)

Roger Paul Alford. *Professor, Law School.* Bachelor of Arts, Baylor University, 1985; Master of Divinity, Southern Baptist Theological S, 1988; Juris Doctor, New York University, 1991 (2012)

Aktar Ali. *Associate Research Professor, Chemistry and Biochemistry.* Bachelor of Science, University of Chittagong, 1991; Master of Science, *ibid.,* 1994; Philosophiae Doctor, Niigata University, 1999 (2021)

Steven Elias Alvarado. *Associate Professor, Sociology; Fellow, Klau Ctr. for Civil & Human Rights; Fellow, Inst for Educational Initiatives.* Bachelor of Arts, Univ of California Berkeley, 2004; Master of Arts, Univ of Wisconsin-Madison, 2006; Philosophiae Doctor, *ibid.,* 2011 (2021)

George Alex Ambrose. *Professor of the Practice, Kaneb Ctr for Teaching and Learning; Fellow, Inst for Educational Initiatives.* Bachelor of Arts, Rutgers State University of NJ, 2002; Master of Arts Education, Rutgers University, 2003; Philosophiae Doctor, Nova University, 2013 (2008)

Khaled Anatolios. *Department Chair, Theology; Fellow, Ansari-Global Engagement w Religion; Professor, Theology; The Rev. John A. O'Brien Professor of Theology; Fellow, Medieval Institute.* Bachelor of Arts, University of St Michaels Coll, 1990; Master of Theology, *ibid.,* 1992; Philosophiae Doctor, Boston College, 1996 (2015)

Selena Kathleen Anders. *Associate Teaching Professor, Dean's Offc-School of Architecture.* Bachelor of Arts, DePaul University, 2005; Master of Architecture, University of Notre Dame, 2009; Philosophiae Doctor, La Sapienza Univ. of Rome, 2016 (2009)

Gary A. Anderson. *Hesburgh Professor of Catholic Theology; Professor, Theology.* Bachelor of Arts, Albion College, 1977; Master of Divinity, Duke University, 1981; Philosophiae Doctor, Harvard University, 1985 (2003)

Thomas Francis Anderson. *Professor, Romance Languages and Literatures.* Bachelor of Arts, Bowdoin College, 1992; Master of Arts, Univ of Pennsylvania, 1994; Philosophiae Doctor, *ibid.,* 1998 (1998)

Krister Andersson. *Professor, Keough School of Global Affairs; Notre Dame Professor of Sustainable Development; Fellow, Pulte Institute for Global Develpmt; Fellow, Kellogg Inst for Intrnl Studies.* Bachelor of Arts, Point Loma Nazarene University, 1989; Master of Arts, Schiller International Univ, 1991; Philosophiae Doctor, Indiana Univ-Bloomington, 2002 (2023)

Corey M. Angst. *Professor, IT, Analytics and Operations; Fellow, Pulte Institute for Global Develpmt; Department Chair, Dean's Office-Mendoza Coll. of Bus.; Jack and Joan McGraw Family Professor of IT, Analytics, and Operations; Concurrent Professor, Center for University Advising.* Bach of Sci in Mech Engr, Western Michigan University, 2001; Master of Business Admin, University of Delaware, 2006; Philosophiae Doctor, University of Maryland, 2007 (2007)

Wendy Angst. *Teaching Professor, Management & Organization; Concurrent Teaching Professor, Center for University Advising.* Bachelor of Science, Michigan State University, 1995; Master in Health Administratio, University of La Verne, 2000 (2010)

Gioacchino Antonelli. *Assistant Professor, Mathematics.* Bachelor Degree—Unspecified, Scuola Normale di Pisa, 2016; Master Degree—Unspecified, *ibid.,* 2018; Philosophiae Doctor, *ibid.,* 2022 (2025)

Panos J. Antsaklis. *H. Clifford and Evelyn A. Brosey Professor of Electrical Engineering; Professor, Electrical Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics.* Diploma, Natl Technical Univ of Athens, 1972; Master of Science, Brown University, 1974; Philosophiae Doctor, *ibid.,* 1977 (1980)

Robert Scott Appleby. *Professor, Keough School of Global Affairs; Keough-Hesburgh Professor; Interim Director of Ansari Institute for Global Engagement with Religion.* Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, University of Chicago, 1979; Philosophiae Doctor, *ibid.,* 1985 (1994)

Ani Aprahamian. *The Frank M. Freimann Professor of Physics; Professor, Department of Physics & Astronomy; Concurrent Professor, Chemistry and Biochemistry.* Bachelor of Arts, Clark University, 1980; Philosophiae Doctor, *ibid.,* 1986 (1989)

Francisco Jose Aragon. *Professor of the Practice, Institute for Latino Studies.* Bachelor of Arts, Univ of California Berkeley, 1989; Master of Arts, New York University, 1990; Master of Arts, Univ California Davis, 2000; Master of Fine Arts, University of Notre Dame, 2003 (2003)

Elizabeth A. Archie. *Professor, Biological Sciences; Notre Dame Collegiate Professor of Biological Sciences.* Bachelor of Arts, Bowdoin College, 1997; Philosophiae Doctor, Duke University, 2005 (2009)

Toros Arikan. *Assistant Professor, Electrical Engineering.* Bachelor of Science, Univ of IL Urbana-Champaign, 2014; Master of Science, *ibid.,* 2017; Philosophiae Doctor, Massachusetts Institute of Tec, 2023 (2025)

Sima Asadi. *Assistant Professor, Chemical and Biomolecular Engr; Clare Boothe Luce Assistant Professor of Chemical Engineering.* Bachelor of Science, Tabriz University, 2009; Master of Science, Sharif Univ. of Technology, 2012; Philosophiae Doctor, Univ California Davis, 2020 (2024)

Brandon Lee Ashfeld. *Professor, Chemistry and Biochemistry.* Bachelor of Science, University of Minnesota, 1998; Philosophiae Doctor, Univ of Texas-Austin, 2004 (2007)

Badih Assaf. *Associate Professor, Department of Physics & Astronomy.* Bachelor of Science, American University of Beirut, 2009; Philosophiae Doctor, Northeastern University, 2014 (2018)

Ann W. Astell. *The John Cardinal O'Hara Professor of Theology; Professor, Theology; Concurrent Professor, Center for University Advising; Fellow, Medieval Institute.* Bachelor of Science, Marquette University, 1974; Master of Arts, *ibid.,* 1981; Philosophiae Doctor, Univ of Wisconsin-Madison, 1987 (2007)

Robert Audi. *Rev. John A. O'Brien Professor of Philosophy; Professor, Philosophy.* Bachelor of Arts, Colgate University, 1963; Master of Arts, University of Michigan, 1965; Philosophiae Doctor, *ibid.,* 1967 (2003)

Yury Petrovich Avvakumov. *Associate Professor, Theology; Fellow, Medieval Institute; Fellow, Nanovic Inst for European Studies.* Master of Arts, Leningrad State University, 1981; Philosophiae Doctor, Russian Theological Seminary, 1990; Philosophiae Doctor, Ludwig-Maximilians Univ Munich, 2001 (2009)

Cory Matthew Ayres. *Assistant Research Professor, Chemistry and Biochemistry.* Bachelor Degree—Unspecified, Georgia Southern Univ, 2011; Philosophiae Doctor, University of Notre Dame, 2018 (2018)

Feraz Azhar. *Assistant Professor, Philosophy.* Bachelor of Science, University of Sydney, 2000; Master of Science, University of Cambridge, 2002; Philosophiae Doctor, Univ of California Sta Barbara, 2008; Master of Science, University of Sydney, 2014; Philosophiae Doctor, University of Cambridge, 2017 (2019)

Susan Elizabeth Azyndar. *Associate Librarian, Library Law.* Bachelor of Arts, University of Redlands, 1997; Master of Arts, University Wyoming, 1999; Juris Doctor, University of Arizona, 2008; Master of Library & Info Sci, University of Washington, 2011 (2020)

Ruediger Bachmann. *Professor, Department of Economics; Fellow, Nanovic Inst for European Studies.* Master of Arts, University of Mainz, 1999; Master of Arts, *ibid.,* 2001; Master of Arts, Yale University, 2002; Master of Philosophy, *ibid.,* 2004; Philosophiae Doctor, *ibid.,* 2007 (2014)

Jeffrey Michael Bacidore. *Associate Teaching Professor, Finance.* Bachelor of Arts, Knox College, 1992; Master of Science, *ibid.,* 1998; Philosophiae Doctor, Indiana Univ-Bloomington, 1998 (2023)

Brad Alan Badertscher. *Deloitte and Touche Professor of Accountancy; Professor, Accountancy; Department Chair, Accountancy.* Master of Business Admin, University of Iowa, 2001; Bachelor of Arts, Univ. of Nebraska at Kearney, 2001; Philosophiae Doctor, University of Iowa, 2007 (2007)

Karla Badillo-Urquiola. *Assistant Professor, Computer Science and Engineering.* Bachelor of Science, University of Central Florida, 2014; Master of Science, *ibid.,* 2015; Philosophiae Doctor, *ibid.,* 2022 (2022)

William Baer. *Librarian, Hesburgh Libraries.* Bachelor of Science, Brigham Young University, 1992; Master of Library & Info Sci, *ibid.,* 1993 (2015)

Christopher Baglow. *Professor of the Practice, McGrath Institute for Church Life.* Bachelor of Arts, Franciscan Univ Steubenville, 1990; Master of Arts, University of Dallas, 1996; Philosophiae Doctor, Duquesne University, 2000 (2018)

Marcio De Oliveira Bahia. *Teaching Professor, Romance Languages and Literatures.* Bachelor of Arts, Federal Univ of Minas Gerais, 2001; Master of Arts, University of Ottawa, 2004; Doctor of Philosophy, *ibid.,* 2011 (2016)

Dror Baitel. *Assistant Professor of the Practice, Music.* Bachelor of Music, The New School, 2008; Master of Music, The Juilliard School, 2017; Doctor of Musical Arts, *ibid.,* 2022 (2022)

Brian M. Baker. *Coleman Professor of Life Sciences; Professor, Chemistry and Biochemistry.* Bachelor of Science, New Mexico State Univ. Park, 1992; Philosophiae Doctor, University of Iowa, 1997 (2001)

Aaron Bradley Bales. *Associate Librarian, Hesburgh Libraries; Department Head, Library Applications Management.* Bachelor of Arts, Harvard University, 1988; Master in Library Science, Indiana Univ-Bloomington, 2001 (1992)

Timothy E. Balko. *Associate Teaching Professor, Management & Organization.* Bachelor of Social Work, Valparaiso University, 1985; Juris Doctor, *ibid.,* 1989 (2013)

Christopher Gordon Ball. *Associate Professor, Anthropology.* Bachelor of Arts, Univ of California Sta Barbara, 1996; Master of Arts, University of Chicago, 2003; Philosophiae Doctor, *ibid.,* 2007 (2013)

Dinshaw S. Balsara. *Professor, Department of Physics & Astronomy; Concurrent Professor, Applied Computational Mathematics & Statistics.* Bachelor of Science, Jai Hind College, 1977; Master of Science, Indian Inst of Tech Kanpur, 1982; Master of Science, University of Chicago, 1986; Philosophiae Doctor, Univ of IL Urbana-Champaign, 1990 (2001)

Christina Bambrick. *Assistant Professor, Political Science.* Bachelor of Arts, Scripps College, 2013; Master of Arts, Univ of Texas-Austin, 2015; Philosophiae Doctor, *ibid.,* 2019 (2020)

Laura Banella. *Assistant Professor, Romance Languages and Literatures.* Bachelor of Arts, Scuola Normale di Pisa, 2008; Master of Arts, *ibid.,* 2010; Master of Arts, *ibid.,* 2011; Philosophiae Doctor, University of Padua, 2014; Philosophiae Doctor, Duke University, 2018 (2022)

Sotirios Angel Barber. *Professor, Political Science.* Bachelor of Arts, Univ of IL Urbana-Champaign, 1964; Master of Arts, University of Chicago, 1967; Philosophiae Doctor, *ibid.,* 1973 (1986)

Daniel W Bardayan. *Professor, Department of Physics & Astronomy.* B.S. Physics, Tennessee Technological Univ, 1993; Master of Science, Yale University, 1994; Master of Philosophy, *ibid.,* 1997; Philosophiae Doctor, *ibid.,* 1999 (2013)

Justin Dewayne Barfield. *Associate Professor of the Practice, Art, Art History, and Design.* Bachelor Degree—Unspecified, Southeastern Louisiana Univ, 2009; Master of Fine Arts, University of Notre Dame, 2013 (2013)

Michael Randall Barnes. *Assistant Research Professor, Inst for Ethics and the Common Good.* Bachelor of Arts, York University Toronto, 2009; Master of Arts, Carleton University Ottawa, 2011; Bachelor of Education, University of Toronto, 2012; Master of Arts, Georgetown University, 2014; Doctor of Philosophy, *ibid.,* 2019 (2024)

Zachary Alexander Barnett. *Assistant Professor, Philosophy.* Bachelor of Arts, Pomona College, 2011; Philosophiae Doctor, Brown University, 2018 (2023)

Christopher Andrew Baron. *Associate Professor, Classics; Concurrent Associate Professor, History.* Bachelor of Arts (Latin), Illinois Wesleyan University, 1995; Master of Arts, University of Chicago, 2000; Philosophiae Doctor, Univ of Pennsylvania, 2006 (2006)

Maria Victoria Barone. *Assistant Professor, Department of Economics.* Bachelor of Arts, National University of Cordoba, 2012; Master of Arts, Universidad Torcuato Di Tella, 2015; Master of Arts, *ibid.,* 2017; Doctor of Philosophy, Univ.of California-Los Angeles, 2023; B.A. Economics, National University of Cordoba, (2023)

Colin Charles Pope Barr. *Professor, Keough School of Global Affairs; Concurrent Professor, History; Fellow, Keough Inst. for Irish Studies; Thomas Moore and Judy Livingston Director of the Keough-Naughton Institute for Irish Studies.* Bachelor of Arts, Stonehill College, 1997; Master of Philosophy, University of Cambridge, 1998; Philosophiae Doctor, *ibid.,* 2000 (2022)

Katrina D. Barron. *Associate Professor, Mathematics.* B.S. Mathematics, University of Chicago, 1986; B.S. Physics, *ibid.,* 1987; Philosophiae Doctor, Rutgers University, 1996 (2001)

Martin Patrick Barron. *Associate Teaching Professor, IT, Analytics and Operations.* Bachelor of Arts, Trinity College, 2013; Master of Science, University of Notre Dame, 2015; Philosophiae Doctor, *ibid.,* 2018 (2020)

David M. Bartels. *Concurrent Professional Specialist, Chemistry and Biochemistry; Research Professor, Radiation Laboratory.* Bachelor of Science, Hope College, 1977; Philosophiae Doctor, Northwestern University, 1982 (2003)

Andrew Charles Bartolini. *Associate Teaching Professor, Dean's Office-Coll. of Engineering; Concurrent Assistant Teaching Professor, Civil & Envr Engr & Earth Sciences; Director, First-Year Engineering Program; Concurrent Associate Teaching Professor, Center for University Advising.* Bach of Sci in Civil Engr, University of Notre Dame, 2013; Doctor of Philosophy, *ibid.,* 2019 (2018)

Scott Alves Barton. *Assistant Professor, Africana Studies.* Bachelor of Fine Arts, Washington University, 1980; Philosophiae Doctor, New York University, 2016 (2022)

Ilona Mathilda Bastiaansen. *Assistant Professor, Accountancy.* B.S. Commerce, University of Saskatchewan, 2014; Master of Accountancy, *ibid.,* 2015; Philosophiae Doctor, Univ of Connecticut, 2023 (2023)

Mary Kathryn Batistich. *Assistant Research Professor, Department of Economics.* B.A. Economics, University of Notre Dame, 2012; Master of Science, Purdue University, 2016 (2020)

Robert Henry Battalio. *Professor, Finance.* Bachelor of Science, Texas A&M University, 1988; Philosophiae Doctor, Indiana Univ-Bloomington, 1995 (2000)

Steven J Battin. *Assistant Professor, Theology.* Bachelor of Science, Xavier University, 1997; Master of Theological Studies, University of Notre Dame, 2005; Philosophiae Doctor, *ibid.,* 2014; Undeclared, Loyola Univ New Orleans, (2017)

Christiane Baumeister. *Professor, Department of Economics; Robert H. Lambert, Class of 1940, Helen B. Lambert, Mary E. Lambert and Michael P. Lambert Professor of Economics.* Bachelor of Arts, University of Bayreuth, 1999; Master of Arts, University of Siena, 2003; Philosophiae Doctor, University of Ghent, 2010 (2015)

Kevin Baxter. *Teaching Professor, Inst for Educational Initiatives; Fellow, Inst for Educational Initiatives.* Bachelor of Arts, Villanova University, 1991; Master of Arts, Loyola Marymount University, 2001; Philosophiae Doctor, Univ of Southern California, 2004 (2021)

Timothy James Bays. *Associate Professor, Philosophy.* Bachelor of Arts, Northwestern University, 1988; Philosophiae Doctor, Univ. of California-Los Angeles, 1994; Philosophiae Doctor, *ibid.,* 1999 (1999)

Jeffrey Charles Beall. *O'Neill Family Professor; Professor, Philosophy.* Bachelor of Arts, Grove City College, 1989; Master of Divinity, Princeton Theological Seminary, 1992; Philosophiae Doctor, Univ of Massachusetts, 1998 (2020)

Edward N. Beatty. *Professor, History; Professor, Keough School of Global Affairs.* Bachelor of Arts, Princeton University, 1983; Master of Arts, University of New Mexico Main, 1992; Philosophiae Doctor, Stanford University, 1996 (2000)

Christopher Jeffrey Bechler. *Assistant Professor, Marketing.* Bachelor of Arts (Latin), Washington University, 2013; Philosophiae Doctor, Stanford University-Palo Alto, 2021 (2021)

Emily Scott Beck. *Assistant Professor of the Practice; Professor of the Practice, Art, Art History, and Design.* Bachelor of Arts, Meredith College, 2001; Master of Fine Arts, UNC at Chapel Hill, 2010 (2013)

Christine Ann Becker. *Associate Professor, Film, Television, and Theatre.* Bachelor of Arts, Univ of IL Urbana-Champaign, 1993; Master of Arts, Univ of Wisconsin-Madison, 1995; Philosophiae Doctor, *ibid.,* 2001 (2000)

Matthew Aaron Becker. *Associate Teaching Professor, Department of Physics & Astronomy.* Bachelor of Science, Emporia State University, 2005; Master of Science, University of Notre Dame, 2009; Philosophiae Doctor, *ibid.,* 2011 (2022)

Gail Bederman. *Associate Professor, History; Concurrent Associate Professor, Gender Studies.* Bachelor of Fine Arts, New York University, 1978; Master of Arts, Brown University, 1984; Philosophiae Doctor, *ibid.,* 1992 (1992)

John Thomas Behrens. *Professor of the Practice, Prg in Technology & Digital Studies; Director of the Office of Learning Analytics; Concurrent Professor of the Practice, Computer Science and Engineering.* Bachelor of Arts, University of Notre Dame, 1983; Master of Arts, Arizona State University, 1987; Philosophiae Doctor, *ibid.,* 1990 (2022)

Mark Joseph Behrens. *John and Margaret McAndrews Professor of Mathematics; Professor, Mathematics.* Bachelor of Science, University Alabama Tuscaloosa, 1998; Master of Arts, *ibid.,* 1998; Philosophiae Doctor, University of Chicago, 2003 (2014)

Heidi Ann Beidinger. *Professor of the Practice, Eck Institute for Global Health.* Bachelor of Science, Indiana Univ-Bloomington, 1989; Master of Public Health, University of IL at Chicago, 1996; Philosophiae Doctor, Western Michigan University, 2013 (2014)

Alexander Daniel Beihammer. *Professor, History; Fellow, Medieval Institute.* Bachelor of Arts, University of Vienna, 1995; Master of Arts, *ibid.,* 1995; Philosophiae Doctor, *ibid.,* 1999 (2015)

Kimberly Hope Belcher. *Associate Professor, Theology; Fellow, Kellogg Inst for Intrnl Studies.* Bachelor of Science, University of Florida, 2001; Master of Theological Studies, University of Notre Dame, 2003; Philosophiae Doctor, *ibid.,* 2009 (2013)

Casher Dale Belinda. *Assistant Professor, Management & Organization.* Bachelor of Science, Pennsylvania St University, 2015; Master of Arts, Appalachian State University, 2017; Master of Science, UNC at Chapel Hill, 2020; Philosophiae Doctor, *ibid.,* 2023 (2023)

Anthony Joseph Bellia. *Professor, Law School; O'Toole Professorship of Constitutional Law; Concurrent Professor, Political Science; Notre Dame Presidential Fellow.* Bachelor of Arts, Canisius College, 1991; Juris Doctor, University of Notre Dame, 1994 (2000)

Patricia Louise Bellia. *The William J. and Dorothy K. O'Neill Professor of Law; Professor, Law School; Notre Dame Presidential Fellow.* Bachelor of Arts (Latin), Harvard University, 1991; Juris Doctor, Yale University, 1995 (2000)

Danuse Bement. *Assistant Professor, Management & Organization.* Bachelor of Science, University of Maine, 2011; Master of Business Admin, *ibid.,* 2016; Philosophiae Doctor, Texas A&M University, 2025 (2024)

Cora Elizabeth Bennett. *Assistant Teaching Professor, Department of Economics; Concurrent Assistant Teaching Professor, Center for University Advising.* Bachelor of Science, Seton Hall University, 2016; Master of Arts, University Tennessee Knoxville, 2017; Philosophiae Doctor, *ibid.,* 2021 (2022)

Judith G Benz. *Teaching Professor, German and Russian Langs and Lit; Fellow, Nanovic Inst for European Studies; Director of Undergraduate Studies, German and Russian Langs and Lit.* Bachelor of Arts, Coll of William & Mary, 1997; Master of Arts, Yale University, 1999; Master of Philosophy, *ibid.,* 2001; Philosophiae Doctor, *ibid.,* 2007 (2020)

Mark Berends. *Professor, Sociology; Fellow, Kellogg Inst for Intrnl Studies.* Bachelor of Arts, Calvin College, 1985; Master of Science, Univ of Wisconsin-Madison, 1988; Philosophiae Doctor, *ibid.,* 1992 (2009)

Nicholas Tibor Berente. *Professor, IT, Analytics and Operations; James H. Sweeny III and Alicia Sweeny Collegiate Professor of IT, Analytics, and Operations; Senior Associate Dean for Academic Programs.* Associate in Applied Science, Cuyahoga Comm College, 1996; Bachelor of Business Admin., John Carroll University, 1996; Master of Business Admin, Case Western Reserve Univ., 2004; Philosophiae Doctor, *ibid.,* 2008 (2018)

Cindy S. Bergeman. *Professor, Psychology.* Bachelor of Science, University of Idaho, 1979; Master of Science, Pennsylvania State University, 1987; Philosophiae Doctor, *ibid.,* 1989 (1990)

Kathleen Nanette Bergman. *Assistant Research Professor, Psychology.* Bachelor Degree—Unspecified, Calvin College, 2007; Master of Arts, University of Notre Dame, 2011; Philosophiae Doctor, *ibid.,* 2013 (2013)

Melissa Berke. *Associate Professor, Civil & Envr Engr & Earth Sciences; Concurrent Associate Professor, Biological Sciences.* Bachelor of Arts, Oberlin College, 2000; Master of Science, Univ of California Riverside, 2003; Philosophiae Doctor, University of Minnesota at Dul, 2011 (2013)

Gianna A. Z. Bern. *Teaching Professor, Finance; Associate Dean for the MBA.* Bachelor of Business Admin., Illinois Institute of Technolo, 1987; Master of Business Admin, University of Chicago, 1989 (2014)

Gary H. Bernstein. *Frank M. Freimann Professor in Engineering-II; Professor, Electrical Engineering.* Bach of Sci in Electrical Engr, Univ of Connecticut, 1979; M.S. Electrical Engr, Purdue University, 1981; Philosophiae Doctor, Arizona State University, 1987 (1988)

Sara Bernstein. *Professor, Philosophy.* Bachelor of Arts, University of Chicago, 2004; Master of Arts, University of Arizona, 2008; Philosophiae Doctor, *ibid.,* 2010 (2016)

Seth A. Berry. *Associate Teaching Professor, IT, Analytics and Operations.* Bachelor of Arts, Southern Illinois Univ at Carb, 2008; Master of Arts, *ibid.,* 2011; Doctor of Psychology, *ibid.,* 2012 (2012)

Marinho Angelo Bertanha. *Associate Professor, Department of Economics; Fellow, Kellogg Inst for Intrnl Studies; Concurrent Associate Professor, Applied Computational Math & Stats.* Bachelor of Science, University of Sao Paulo, 2006; Master of Arts, Fundacao Getulio Vargas de Sao, 2009; Philosophiae Doctor, Stanford University, 2015 (2016)

John Renner Betz. *Associate Professor, Theology; Concurrent Associate Professor, German and Russian Langs and Lit.* Bachelor of Arts, Wake Forest University, 1991; Philosophiae Doctor, University of Virginia, 1999 (2010)

Laura Wells Betz. *Associate Teaching Professor, English; Director of Undergraduate Studies.* Bachelor of Arts, University of Virginia, 1997; Master of Arts, *ibid.,* 1999; Philosophiae Doctor, University of Maryland, 2005 (2017)

Kraig Beyerlein. *Director of the Center for Study of Religion & Society; Director of Graduate Studies, Sociology; Associate Professor, Sociology; Fellow, Ansari-Global Engagement w Religion.* Bachelor of Arts, Concordia University, 1998; Master of Arts, UNC at Chapel Hill, 2002; Philosophiae Doctor, *ibid.,* 2006 (2009)

Kyle James Bibby. *Professor, Civil & Envr Engr & Earth Sciences; Fellow, Pulte Institute for Global Develpmt; Associate Chair, Civil & Envr Engr & Earth Sciences.* Bachelor Degree—Unspecified, University of Notre Dame, 2008; Philosophiae Doctor, Yale University, 2012 (2017)

Katherine Alexis Biberdorf. *Teaching Professor, Chemistry and Biochemistry; Professor of Public Engagement in Science.* Bachelor of Science, University of Michigan, 2008; Philosophiae Doctor, Univ of Texas-Austin, 2014 (2024)

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