

# BULLETIN OF INFORMATION

UNDERGRADUATE PROGRAMS | 2013-2014

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UNIVERSITY OF  
NOTRE DAME

2013–14

## Bulletin of Information

University of Notre Dame

### *Undergraduate Programs*

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Vol. 109, No. 2, August 2013

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.

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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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## ACADEMIC CALENDAR

**UNIVERSITY OF NOTRE DAME AND SAINT MARY'S COLLEGE  
JOINT ACADEMIC YEAR CALENDAR FOR 2013-2014**

**FALL 2013 SEMESTER**

Aug. 20-21	Tues – Wed	Orientation for international students at Notre Dame
Aug. 22-24	Thur - Sat	Orientation and counseling for new students at Saint Mary's College
Aug. 22	Thursday	Orientation, advising, and registration for readmitted and new transfer students at Notre Dame
Aug. 23	Friday	Undergraduate halls open for first year student move-in beginning at 9:00 a.m. for ND Orientation, advising, and registration for new graduate students at Notre Dame
Aug. 24-25	Sat - Sun	Orientation and advising for freshmen at Notre Dame
Aug. 25	Sunday	Undergraduate halls open for upperclassman move-in beginning at 9:00 a.m. for ND
Aug. 26	Monday	Classes begin for Law and Graduate Business Classes begin for Saint Mary's College
Aug. 27	Tuesday	Classes begin for Notre Dame Mass - formal opening of school year at Notre Dame
Sept. 2	Monday	Labor Day - classes are in session
Sept. 3	Tuesday	Last date for all class changes
Sept. 27	Friday	Last date to drop a class at Saint Mary's College
Oct. 18	Friday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Oct. 19-27	Sat - Sun	Mid-Term break
Oct. 22	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary's College
Nov. 1	Friday	Last day for course discontinuance at Notre Dame
Nov. 18-Dec.4	Mon - Wed	Registration appointments for the Spring 2014 semester
Nov. 27-Dec.1	Wed - Sun	Thanksgiving Holiday
Dec. 3-15	Tues - Sun	Course Instructor Feedback administered at Notre Dame
Dec. 12	Thursday	Last class day
Dec. 13-15	Fri - Sun	Reading days (no examinations)
Dec. 16-20	Mon - Fri	Final examinations
Dec. 21	Saturday	Undergraduate halls close at 2:00 p.m.
Dec. 23	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame All grades due in PRISM by Noon at Saint Mary's College
Jan. 5	Sunday	January graduation date (no ceremony)

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\*

	<u>Mon</u>	<u>Tues</u>	<u>Wed</u>	<u>Thur</u>	<u>Fri</u>	<u>Total</u>
August	0	1	1	1	1	4
September	5	4	4	4	4	21
October	3	4	4	4	3	18
November	4	4	3	3	4	18
December	2	2	2	2	1	9
Total	14	15	14	14	13	70

## ACADEMIC CALENDAR

**SPRING 2014 SEMESTER**

Jan. 12	Sunday	Undergraduate halls open for move-in beginning at 9:00 a.m. for Notre Dame
Jan. 13	Monday	Orientation, advising, and registration for new students Classes begin for Law and Graduate Business Classes begin for Saint Mary's College
Jan. 14	Tuesday	Classes begin for Notre Dame
Jan. 21	Tuesday	Last date for all class changes
Feb. 14	Friday	Last date to drop a class at Saint Mary's College
Feb. 14-16	Fri - Sun	Junior Parents Weekend at Notre Dame
Mar. 7	Friday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Mar. 8-16	Sat - Sun	Mid-Term break
Mar. 11	Tuesday	Mid-Term deficiency reports due in PRISM by 8:00 a.m. at Saint Mary's College
Mar. 19	Wednesday	Registration begins for the 2014 Summer Session at Notre Dame
Mar. 21	Friday	Last day for course discontinuance at Notre Dame
Apr. 14-24	Mon -Thur	Registration appointments for the Fall 2014 semester
Apr. 18-21	Fri - Mon	Easter Holiday
Apr. 22-May 4	Tues - Sun	Course Instructor Feedback administered at Notre Dame
April 25	Friday	Deadline for 2014/2015 financial aid applications at ND (for returning students)
April 30	Wednesday	Last class day for Notre Dame
May 1	Thursday	Last class day for Saint Mary's College
May 1-4	Thur - Sun	Reading days for Notre Dame (no examinations)
May 2-4	Fri - Sun	Reading days for Saint Mary's College (no examinations)
May 5-9	Mon - Fri	Final examinations
May 10	Saturday	Undergraduate halls close at 2:00 p.m.
May 12	Monday	All grades submitted through insideND by 3:45 p.m. at Notre Dame
May 13	Tuesday	All grades are due in PRISM by Noon at Saint Mary's College
May 16-18	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\***

	<u>Mon</u>	<u>Tues</u>	<u>Wed</u>	<u>Thur</u>	<u>Fri</u>	<u>Total</u>
January	2	3	3	3	3	14
February	4	4	4	4	4	20
March	4	3	3	3	3	16
April	3	5	5	4	3	20
May	0	0	0	0	0	0
Total	13	15	15	14	13	70

**2014 SUMMER SESSION**

First Class Day - June 16; Last Class Day – July 25; Graduation Date (No Ceremony) – August 3

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

## ACADEMIC CALENDAR

**UNIVERSITY OF NOTRE DAME AND SAINT MARY'S COLLEGE  
JOINT ACADEMIC YEAR CALENDAR FOR 2014-2015**

**FALL 2014 SEMESTER**

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Aug. 26	Tuesday	Classes begin for Notre Dame 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. 17	Friday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Oct. 18-26	Sat - Sun	Mid-Term break
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 2015 semester at Notre Dame and Saint Mary's College
Nov. 26-30	Wed - Sun	Thanksgiving Holiday
Dec. 2-14	Tues - Sun	Course Instructor Feedback administered at Notre Dame
Dec. 11	Thursday	Last class day
Dec. 12-14	Fri - Sun	Reading days (no examinations)
Dec. 15-19	Mon - Fri	Final examinations
Dec. 20	Saturday	Undergraduate halls close at 2:00 p.m.
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 graduation date (no ceremony)

CLASS MEETINGS\*

MWF	41
MW	28
TuTh	29

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## ACADEMIC CALENDAR

**SPRING 2015 SEMESTER**

Jan. 11	Sunday	Undergraduate halls open for move-in beginning at 9:00 a.m. for Notre Dame
Jan. 12	Monday	Orientation, advising, and registration for new students Classes begin for Law and Graduate Business Classes begin for Saint Mary's College
Jan. 13	Tuesday	Classes begin for Notre Dame
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
Mar. 6	Friday	Mid-Term deficiency reports submitted through insideND by 3:45 p.m. at Notre Dame
Mar. 7-15	Sat - Sun	Mid-Term break
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 2015 Summer Session at Notre Dame
Mar. 20	Friday	Last day for course discontinuance at Notre Dame
Apr. 3-6	Fri - Mon	Easter Holiday
Apr. 13-22	Mon - Wed	Registration appointments for the Fall 2015 semester
Apr. 21-May 3	Tues - Sun	Course Instructor Feedback administered at Notre Dame
April 24	Friday	Deadline for 2015/2016 financial aid applications at ND (for returning students)
April 29	Wednesday	Last class day for Notre Dame
April 30	Thursday	Last class day for Saint Mary's College
Apr.30-May 3	Thur - Sun	Reading days for Notre Dame (no examinations)
May 1-3	Fri - Sun	Reading days for Saint Mary's College (no examinations)
May 4-8	Mon - Fri	Final examinations
May 9	Saturday	Undergraduate halls close at 2:00 p.m.
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\***

	<u>Mon</u>	<u>Tues</u>	<u>Wed</u>	<u>Thur</u>	<u>Fri</u>	<u>Total</u>
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
May	0	0	0	0	0	0
Total	13	15	15	14	13	70

**2015 SUMMER SESSION**

First Class Day - June 15; Last Class Day – July 24; Graduation Date (No Ceremony) – August 2

*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.

### THE MISSION

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 credal 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, which 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 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's Indiana Province. 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

## STUDENT LIFE

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

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

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

## Notre Dame's Vision for Undergraduate Education

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

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

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

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

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

## Student Life

First and foremost, 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. But cognizant that values, character, and leadership skills are developed as often in the context of caring relationships as in selected reading from various textbooks, the University offers more to its students—a student life rich in depth and variety, one that is nationally recognized and characteristically deep in its impact on those who share in it. To make our "definition" of the University more complete, we shall briefly describe some of the main aspects of student life. Our first consideration will be the students themselves.

**Students.** Notre Dame is one of a handful of truly national universities, with students drawn from all 50 states and more than 100 countries. One factor all the students have in common, though, is strong academic ability. In addition, an annual survey of freshmen taken by the American Council on Education indicates that Notre Dame students, to a greater degree than their peers nationally, are confident of academic success and see themselves as having originality and leadership potential.

**The Campus.** One especially appealing aspect of life at Notre Dame is the campus itself. The University's 1,250 acres, with two lakes, extensive wooded areas, and tree-lined quadrangles, contribute to a serene park-like atmosphere that does wonders to alleviate the pressures of academic life.

The collegiate Gothic style of many of the structures, the ornate Main Building (with a golden dome), and the Basilica of the Sacred Heart and the statuary and masonry carvings that abound on campus have always been a source of delight to students and tourists alike.

**Residentiality.** Over the years no single nonacademic characteristic of Notre Dame has made a greater impression on students than the University's residential tradition. It is a tradition as old as the University itself. Our founder, Father Edward Sorin, established at Notre Dame the sort of residential ambience he had known at French universities. Nineteenth-century students slept, ate, studied, and attended classes en masse in wings of the Main Building. The regimen was strict: a prefect roused students at 6 a.m., supervised their prayer, meals, study, and recreation and returned them to bed 16 hours later.

Times have changed, as well as the discipline, but not the importance of residentiality in student life. According to a committee focusing on University priorities, "Next to its academic mission and Catholic character, residentiality is the least dispensable of Notre Dame's hallmarks."

Each of Notre Dame's 29 undergraduate residence halls has an atmosphere and character of its own. Each has its traditions and generates a feeling of loyalty and camaraderie among its inhabitants. The halls are staffed by rectors, assistant rectors, and resident assistants who endeavor to challenge, facilitate, and support students in integrating the meaning and practice of Christianity today through the development of a community that is humanizing, worshipping, and service-oriented. Consequently, the residence halls form the base of many spiritual, athletic, social, and volunteer service activities. Spirited rivalries between residence halls in various sporting and social events are common. Life in the residence halls provides the context for many relationships among students; social fraternities and sororities are thus considered unnecessary.

First-year students are required to live on campus, and the vast majority of upper-class students find it worthwhile to do the same when space is available. Approximately 80 percent of undergraduates live on campus. At the same time, a variety of off-campus housing is available in the South Bend area.

**Spiritual Life.** Notre Dame stands for the belief that all who teach, work, and study at the University should discover, reinforce, and strengthen their convictions, values, and traditions. A mature religious or spiritual life is integral to full human development. This can be hidden, stifled, or allowed to stagnate; but it can also be challenged and encouraged to grow. In residence hall life and classroom, in liturgy and celebration, in volunteer work and athletic competition, Notre Dame people strive for a wholeness in their lives, even a holiness, as they discover who they are in these multiple arenas.

## STUDENT LIFE

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

The Office of Campus Ministry provides a series of retreats, catechetical instruction for those who wish to join the Catholic Church or find deeper understanding of religious matters, a program of preparation for marriage, and counseling in matters of personal conscience formation. Mass is celebrated daily in the Basilica of the Sacred Heart and in many of the residence hall chapels. There are frequent prayer services of many forms throughout the year, including ecumenical prayer services sponsored by Campus Ministry. Students who are not Catholic are always welcome at any of the various activities sponsored by Campus Ministry. Congregations of many faiths in South Bend also welcome students in their worship.

**Clubs and Organizations.** Notre Dame has a wealth of clubs and organizations for interested students. Interests and commitments vary widely and are reflected in the number and scope of groups.

Some clubs have an academic orientation, ranging from campus branches of national organizations, such as the American Institute of Architects, to strictly local clubs, such as the Chemistry and Finance clubs.

Other groups have an ethnic or special-interest focus. These clubs include the Asian American Association, the Black Cultural Arts Council, the Chinese Students Association, and the Native American Students Association, to name a few.

Students who enjoy music may choose from a wide selection of choirs, bands, and ensembles. Students may audition for the renowned Notre Dame Glee Club, the Notre Dame Liturgical Choir, the Notre Dame Chorale, the Notre Dame Folk Choir, Voices of Faith gospel ensemble, or the Notre Dame Women's Choir. The famous Notre Dame Marching Band, the nation's oldest, continuous university marching band, is one of many choices available for musicians. Another is the concert band, which travels to a different part of the United States each spring, representing Notre Dame in concert. Other specialty groups include a jazz band and orchestra.

**Center for Social Concerns (CSC).** The Center for Social Concerns provides a wide variety of service-learning and social action opportunities, programs, seminars, and courses. For more information, see "Center for Social Concerns," later in this section of the *Bulletin*.

**Media.** Students with interests in journalism usually are attracted to an outlet in the various media on campus.

*The Observer*, an independent student newspaper serving the Notre Dame-Saint Mary's College community, is published five times a week, offering

a vital line of communication within the University, as well as the chance to keep up with the "outside world."

The *Scholastic* is a news/general information magazine, and the oldest college publication in the country. The *Juggler*, Notre Dame's journal of the arts, is published once a semester and features prose, poetry, photography, and illustrations. The award-winning *Dome*, the University yearbook, appears every April.

There are a number of other student publications with more specialized audiences—for example, *Notre Dame Student Business Review* and *Technical Review*, which appear periodically throughout the year and are student-produced.

WSND/FM and WVFI are the University's student-run broadcast media. WVFI, which broadcasts over the Internet, airs mostly progressive rock and special programs, while WSND has a more classical selection (until late evening, when rock and jazz are featured).

**Annual Events.** Notre Dame students look forward to participating in several events that occur annually on campus.

Notre Dame's theatre department presents several major productions each year, and tryouts are open to all students. The Notre Dame Student Players present less traditional theatre, providing one drama or musical each semester.

The Notre Dame Literary Festival is a celebration of the literary arts. Visiting authors read from their works, expound on personal philosophy and offer student workshops. Guests have included Ken Kesey, W.P. Kinsella, Jean and Robert Hollander, and Candace Bushnell.

Students also take advantage of the nearby Lake Michigan beaches and the Michigan ski areas. Trips to Chicago are frequently organized to attend the theatre, museums, shops, or sporting events or just to spend the day sightseeing. South Bend, with a metro population of some 275,000, offers shopping, parks, sports, movies, and cultural events. The East Race Waterway is an attraction providing kayaking, tubing, and rafting.

**Athletics.** The name "Notre Dame" no longer brings thoughts of just a football powerhouse, and with good reason. Notre Dame has developed into an outstanding academic institution but at the same time has expanded its athletic excellence beyond the football field.

### INTERCOLLEGIATE

The University is committed to a well-rounded program for both men and women. The Fighting Irish athletic tradition, renowned throughout the United States, encompasses much more than football and basketball. Notre Dame boasts national contenders in many Olympic sports, including women's soccer, men's lacrosse, men's and women's

fencing, and hockey, all of which ranked number one in the country at some point during the past six seasons. Since 2001, Notre Dame has won national championships in women's basketball ('01), women's soccer ('04 and '10) and fencing ('05 and '11).

The women's intercollegiate athletic program, which has grown tremendously over the last 20 years, now includes 13 varsity sports (there are also 13 men's sports). Notre Dame women student-athletes compete in basketball, tennis, fencing, lacrosse, swimming and diving, volleyball, softball, golf, indoor and outdoor track and field, cross country, soccer and rowing.

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 greatest student body in the world" are a moving force that embodies 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 test their skills with the nation's best.

Family Programming is an integral part of the RecSports programming package. With roots tied deeply to Notre Dame's mission, Family Programming seeks to meet the recreational needs of Notre Dame's families in order to help families grow stronger physically, mentally, and spiritually. Even Fridays is one of our main family programs. Even Fridays occurs on the second and fourth Friday of every month. These are traditional family recreation opportunities such as bowling, swimming, game nights, and bike rides. All Even Friday events are from 5:30–7:30PM and are designed to reach a wide range of family ages and abilities. Family FIRST (Fitness Instruction, Recreation, & Sports Training) is our other main family program. Family FIRST classes focus more specifically on the fitness needs of families. Typical classes are yoga, martial arts, cardio, fixed cycling, and rock climbing.

### FACILITIES

Notre Dame is home to some of the finest athletic facilities at any university. The 78,000-square-foot Rolfs Sports Recreation Center has a large state-of-the-art fitness room with more than 30 cardiovascular machines and a full complement of strength machines and free weights. The Rolfs also has a three-lane, 1/8 mile track; three courts for basketball, volleyball, and badminton; a rink-style court for soccer and inline hockey; and two activity rooms for dance, aerobics, and martial arts. In 2007–08, Rolfs Sports Recreation Center celebrated its 10th anniversary by adding new audio-visual technology in meeting rooms and installing a new "cardio theatre" in the fitness room to enhance participant experience.

## STUDENT LIFE

The Rockne Memorial is legendary for its highly competitive pickup basketball games but also has 10 handball/racquetball courts, one combination squash/handball court, a swimming pool with a spectator gallery, a smaller pool for family use, a climbing wall, a weight room, a fitness room, and two rooms for dance and group exercise. In 2007–08, the Rockne Memorial added new audio-visual technology in the First Aid/CPR classroom, completed updating of all water fountains including cooling and filtration, created a “spinning studio” in the former racquetball court and upgraded to larger 50-pound washer and dryer equipment.

In addition to the nine-hole Notre Dame Golf Course, the 18-hole William K. and Natalie O. Warren Golf Course opened in the spring of 2000 on the northeast edge of campus. Other outside facilities include basketball courts in several locations, 14 outdoor tennis courts, and several multipurpose playing fields.

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 a field house containing a two-lane track, boxing and weight rooms, and five volleyball courts. Elsewhere in the building are an auxiliary gym, two intramural gyms and a gym for fencing, six handball/racquetball courts, and two squash courts. The Rolfs Aquatic Center, with its Olympic-sized swimming pool, completes this complex.

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

Melissa Cook Softball Stadium opened for competition on April 13, 2008. This state-of-the-art venue honors the 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, spacious press box, six batting cages, chair back and bleacher seating, interior restrooms, and concession stand.

The Guglielmino Athletic Complex, affectionately referred to as “The Gug” (pronounced Goog) opened in the fall of 2005. The 95,840-square-foot facility houses locker rooms for both the football student-athletes and coaches, coaches’ offices, team meeting rooms, a 148-seat auditorium, athletic training, and the new 25,000-square foot Haggar Fitness Center, used by all of Notre Dame’s 26 varsity athletic teams, with the latest in state-of-the-art strength training equipment, a 50-yard track for speed workouts, and a 45-by-18-yard Prestige Turf field for team stretching exercises and workouts.

The Loftus Sports Center houses Meyo Field. The center, which measures 614 by 210 feet, also contains practice areas for football, lacrosse, soccer, baseball and softball. A six-lane indoor track circles Meyo Field, a 120-yard synthetic-turf practice field (new in 2003).

The University’s Eck Pavilion, a 35,000-square-foot structure opened in 1987, is the place on campus for indoor tennis. Inside are six courts, coaches’ offices, showers and lockers, a repair shop, a vending lounge, and an observation deck. The pavilion is used by the varsity men’s and women’s tennis teams.

Other facilities used by Irish athletic teams include:

*Notre Dame Stadium*, with its 80,795 seats, home to Irish football since 1930.

*Frank Eck Stadium*, with its 2,500 seats, home to Irish baseball since 1994 and upgraded in 2011 via a remodeled clubhouse.

*Labar Practice Complex*, with its two artificial turf (used primarily by the football squad) practice fields and one natural grass field, also used by Rec Sports. The fields are lighted and secured by an eight-foot-fence.

Recently completed new facilities include:

*Alumni Soccer Stadium*—Notre Dame opened the Alumni Soccer Stadium (men’s and women’s soccer) in 2009. The approximately 3,000-seat facility, which sits side by side with the new Irish lacrosse 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.

*Outdoor Track and Field Complex*—The new nine-lane track is located southeast of the Joyce Center and is the competition and practice site for the men’s and women’s track and field teams. Throwing and jumping events are provided in two directions, and a warm-up area is located at one end of the track.

*Arlotta Lacrosse Stadium*—Arlotta Stadium is the new home for men’s and women’s lacrosse programs. Located east of the Joyce Center, Arlotta Stadium 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, a press box with over 20 seats for media and support staff along with three broadcast booths, restrooms and concession areas. The first event in the new stadium was held Oct. 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 vs Dartmouth.

*Compton Family Ice Arena*—Construction of this new, two-sheet ice facility began in March 2010. It is located just north of Angela Boulevard and just west of Leahy Drive. The ice surface (200’ x 90’) in the main arena (capacity ~5,000) is named the Charles W. “Lefty” Smith Jr. Rink, while the auxiliary rink is Olympic dimensions (200’ x 100’). 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 Oct. 18, 2011, and Notre Dame played its first hockey game in the new building Oct. 21 vs. RPI.

**Student Government.** The unique blend of elements that gives the Notre Dame community its identity has, over a period of years, 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. As the basic unit of student government, the halls, and their needs significantly shape the campus-wide student government.

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 residence and University life, and to 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. In addition, it coordinates *The Show*, a major back-to-school campus concert, and the Notre Dame Literary Festival (which were previously mentioned under “Annual Events”), as well as the Collegiate Jazz Fest, Acoustic Cafe, student bands, and other student performances, professional entertainment, and special events. The Student Union Board also coordinates services such as plant and furniture sales, as well as refrigerator rentals.

**Student Conduct.** A Catholic university is a society composed of faculty and students 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 the student.

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*, which is distributed to each student. *du Lac* is also available on the University's website, [nd.edu](http://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.

**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.

## Important Information About Campus Security and Fire Safety

The security of all members of the campus community is of paramount concern to the University of Notre Dame. The University publishes an annual report outlining security and fire safety information and crime statistics for campus. This document provides suggestions regarding crime prevention strategies and important policy information about emergency procedures, reporting of crimes, law enforcement services on campus, fire safety, and information about support services for victims of sexual assault. The brochure also contains information about the University's policy on alcohol and other drugs, the SafeWalk program and campus shuttle service. You may view the document on the web at: <http://ndsp.nd.edu/crime-information-and-clery-act/safety-brochure-clery-act>. A printed copy of this brochure is available by sending an email request to [ndsp@nd.edu](mailto:ndsp@nd.edu) or by writing to: Office of the Director, University Security Police, 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 a First Year of Studies, four undergraduate colleges, an architecture school, a graduate school of four divisions, a graduate business school, a law school, and several graduate research study centers.

All incoming freshmen spend their first year in the College of First Year of Studies and then move into the college or school of their choice as sophomores—College of Arts and Letters, Mendoza College of Business, College of Engineering, College of Science, or School of Architecture.

In the 2012–2013 academic year, students enrolled in the College of Arts and Letters topped the undergraduate enrollment figures with 2,097. There were 1,925 business students, 1,261 science students, 1,052 in engineering, and 153 in architecture.

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

## UNIVERSITY REQUIREMENTS

Psychology  
 Romance Languages and Literatures  
   French  
   Italian  
   Romance Languages and Literatures  
   Spanish  
 Sociology  
 Theology

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

Accountancy  
 Finance  
 Information Technology Management  
 Management Consulting  
 Marketing

The College of Engineering offers curricula leading to degrees of:

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

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

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

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

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

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

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

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

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

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

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

**Advising.** All first-year students enter the College of First Year of Studies and are assigned an advisor from its faculty. The **First Year of Studies** offices are located at 219 Coleman-Morse Center. During their first year all students will receive the advising from their First Year of Studies advisor. Students will select the college in which they want to pursue their undergraduate degree by the end of their first year and will be directed to speak with an advisor in their intended college during their sophomore year. **Architecture**—110 Bond Hall; **Arts and Letters**—104 O'Shaughnessy Hall; **Business**—101 Mendoza College of Business; **Engineering**—257 Fitzpatrick Hall; **Science**—174 Hurley 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 the University pre-law advisor, Assistant Dean Ava Preacher, in 104 O'Shaughnessy Hall.

**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 seven-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 the satisfactory completion of the curriculum. This includes:

University Requirements	Courses
Writing and Rhetoric	1
*Mathematics	2
*Science	2
*History	1
*Social Science	1
*Theology	2
*Philosophy	2
*Fine Arts or Literature	1
‡Physical Education	2
	—
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\* One of these requirements must be University Seminar 13180–13189.

‡ This requirement can also be fulfilled through first-year enrollment in ROTC.

- Only courses marked as “Univ. Req.” via the online Class Search can be used to fulfill a University requirement. 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 and clicking on the “Class Search” link.
- 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.
- First-year students are required to complete a University seminar; Writing & Rhetoric course; two semester courses in mathematics; two semester courses in science; one semester course chosen from: history, social science, philosophy, theology, fine arts; and two semester courses in physical education or in ROTC. The University seminar will satisfy the relevant requirement in fine arts, literature, history, social science,

## UNIVERSITY REQUIREMENTS

philosophy, theology, mathematics, or science. Foreign language is not a University requirement, but it is required in the programs of the College of Arts and Letters, the College of Science, and the School of Architecture. Three credits in a social science course (excluding economics) and three credits in a College of Arts & Letters course (excluding economics) are required in the Mendoza College of Business.

- (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.

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 and Rhetoric.** This requirement aims to better prepare students to read and write effectively. Students learn to identify an issue amid different and conflicting points of view in what they read; frame and sustain an argument that not only includes the analysis and exposition of information, but also establishes what is at stake in accepting their views; provide relevant evidence to support a given point of view; identify and analyze potential counterarguments; develop basic skills for writing a research proposal, for conducting original research (i.e., through archival research, surveys, or interviews), and for using the library's print and electronic information resources; and learn to use and recognize conventions of language in writing academic papers.

**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.

**Mathematics.** Students develop quantitative reasoning skills through the disciplined study of mathematics. Solving problems fosters deductive reasoning, while drawing conclusions from mathematical analyses promotes inductive reasoning. Students learn to convey mathematical concepts and relationships through symbols, formulas, and analytical manipulations. By modeling quantitative behavior in business, science, engineering, and the social sciences, students gain a deeper understanding of the vital role that mathematics plays in modern society.

**Science.** Through the study of science, students learn how knowledge of the natural world is built on observation, experiment, and evidence. They develop a basic understanding of the scientific method, 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.** Students approach works of art from critical perspectives—as viewers or listeners they apply the analytical tools needed to realize the insights and pleasures that artistic texts and works offer. Students may also create their own works of art, and in so doing gain insights as to how artists interact with their media and how creativity meshes with understanding. Through study of the fine arts, students gain an appreciation of the arts as a component of lifelong learning, and they learn how the arts speak of their societies and how societies speak through their arts.

**Literature.** Students gain an appreciation of the literariness of the texts they read by recognizing the formal, stylistic, and rhetorical practices, as well as the inter-relations among these. By identifying connotations and denotations, figures of speech and thought, and conventions of genre, students comprehend the way in which a given literary text is embedded in a particular social, cultural, literary, or intellectual context. They analyze the claims of competing interpretations of a literary text, especially with reference to the historical position or theoretical allegiances of the interpreter. Students think more critically about themselves and about their own place in culture or society.

**Physical Education.** Students will develop an appreciation of a physically active lifestyle and acquire the skills associated with particular physical activities that can be used throughout one's lifetime. Students will also learn about healthy responses to many of the major issues facing college-aged students; e.g., nutrition, exercise, stress, rest, healthy relationships, diversity, alcohol, drugs, test preparation, time management, and conflict management.

## Graduation Rate

Of the students entering a full-time, first-year, bachelor degree-seeking program in the fall of 2006, 95 percent graduated within six years. The complete IPEDS Graduation Rate Survey may be found in the Office of Strategic Planning and Institutional Research. (<http://ospir.nd.edu>)

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

### Accreditation and Academic Association.

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

Transcripts for currently enrolled students can be requested online via insideND ([inside.nd.edu](http://inside.nd.edu)) by clicking on the "Student Academic" tab. Then, within the "Student Academic Services" channel, click on the "Transcript Request" link. Former students can obtain the request form at [registrar.nd.edu](http://registrar.nd.edu) or in the Office of the Registrar, 300 Grace Hall, Notre Dame, IN 46556.

## Grading System

<b>Letter Grade</b>	<b>Point Value</b>	<b>Description</b>	<b>Explanatory Comments</b>
A	4.000	Truly Exceptional	Work meets or exceeds the highest expectations for the course
A-	3.667	Outstanding	Superior work in <i>all</i> areas of the course
B+	3.333	Very Good	Superior work in <i>most</i> 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 <i>All</i> Basic Standards	Work meets all the basic requirements and standards for the course
C	2.000	Acceptable: Meets <i>Most</i> Basic Standards	Work meets most of the basic requirements and standards in several areas
C-	1.667	Acceptable: Meets <i>Some</i> Basic Standards	While acceptable, work falls short of meeting basic standards in several areas.
D	1.000	Minimally Passing	Work just over the threshold of acceptability
F	0	Failing	Unacceptable performance
X	0		Given with the approval of the student's dean in extenuating circumstances beyond the control of the student. It reverts to "F" if not changed within 30 days after the beginning of the next semester in which the student is enrolled.

These "descriptions" and "explanatory comments" are intended to be sufficiently general to apply across the University, but obviously have to be "applied" in manners specific to each department.

<b>Letter Grade</b>	<b>Grades assigned by the Registrar; i.e., not to be given by the faculty</b>
W	Discontinued with permission of the student's dean (or the dean's designee). A student may withdraw from a course only in cases of serious mental or physical illness per Section 6.5.1 of the Academic Code.
NR	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. See the Academic Code for details.
F*	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. See the Academic Code for details.

<b>Letter Grade</b>	<b>Grades that may be given but are not included in the computation of the average</b>
P	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 one elective course per semester, not to exceed four credit hours, outside the student's major department and not required by the student's program, on a pass/fail basis. See the Academic Code for details.
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). See the Academic Code for details.
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). See the Academic Code for details.

## 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 *Student Guide to the Academic Code of Honor* ([honorcode.nd.edu](http://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 will not participate in or tolerate academic dishonesty.**

## The Undergraduate Academic Code

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

## Notre Dame NetID Student Policy

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

## Academic Resources

**Faculty.** In 2012–13, Notre Dame's instructional faculty numbered 1082 full-time and 139 part-time. Other faculty, such as administrative, professional specialists, librarians, and research fellows, numbered 373 full-time and 64 part-time. Ninety percent of the full-time instructional faculty have terminal degrees; 91 percent of them have doctorates. Ninety-eight percent of the full-time instructional faculty are lay persons. (The faculty to student ratio is 1:11.)

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

We often hear students say, "If only I had known sooner how much help I could get from the Libraries...my job as a student would have been much easier!" Reference and 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](http://library.nd.edu) for a list of subject specialists, resource guides and special programs to help focus your efforts and develop your research skills. For example, *Pot of Gold*, an interactive web-based tutorial, is an important resource that helps students learn to efficiently locate, retrieve, evaluate and use new information. This is just one of our many programs that build information and digital literacy, essential lifelong skills for all students in every area of scholarship.

During the academic year, the Hesburgh Library is open 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](http://library.nd.edu).

**Main Library.** The iconic Theodore M. Hesburgh Library, which celebrates a milestone 50-year anniversary 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](http://library.nd.edu)

Center for Digital Scholarship  
1st Floor NE, Hesburgh Library  
(574) 631-1763

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

Rare Books and Special Collections  
102 Hesburgh Library  
(574) 631-0290  
[rarebooks.library.nd.edu](http://rarebooks.library.nd.edu)

**Branch Libraries.** Library services have expanded beyond the building adorned with the Word of Life mural to include 8 branch libraries:

Architecture Library  
117 Bond Hall  
(574) 631-6654  
[library.nd.edu/architecture](http://library.nd.edu/architecture)

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

Chemistry-Physics Library  
231 Nieuwland Science Hall  
(574) 631-7203  
[library.nd.edu/chemistry](http://library.nd.edu/chemistry)

Engineering Library  
149 Fitzpatrick Hall  
(574) 631-6665  
[library.nd.edu/engineering](http://library.nd.edu/engineering)

Kellogg-Kroc Library  
318 Hesburgh Center for International Studies  
(574) 631-8534  
[library.nd.edu/kelloggkroc](http://library.nd.edu/kelloggkroc)

O'Meara Mathematics Library  
001 Hayes-Healy Center  
(574) 631-7278  
[library.nd.edu/mathematics](http://library.nd.edu/mathematics)

Radiation Chemistry Reading Room  
105 Radiation Research Building  
(574) 631-6163  
[library.nd.edu/radlab](http://library.nd.edu/radlab)

Visual Resources Center  
216 Riley Hall  
(574) 631-4273  
[library.nd.edu/vrc](http://library.nd.edu/vrc)

**Subject Librarians.** More than 40 subject librarians provide invaluable expertise and support services for the teaching, research and scholarship initiatives of the University community, [library.nd.edu/directory/subjects](http://library.nd.edu/directory/subjects). Services offered by Subject Librarians include research consultations, materials purchase requests, and bibliographic 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.

## ACADEMIC RESOURCES

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.

**Center for Digital Scholarship.** New in the fall of 2013, the Center for Digital Scholarship is located in Hesburgh Library's northeast corner on the 1st floor. The Center (CDS) leverages state-of-the-art technologies, enabling students and faculty to explore new methodologies, analyze complex data and share research results in ways never before possible. The Center is nimble, capable of rapidly adopting new technologies as they emerge—transforming how teaching, research and scholarship are performed here at Notre Dame.

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

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

**Center Services.** To ensure excellent service, the Hesburgh Libraries will open with targeted services in the fall of 2013. These services include: GIS (Geographic Information System) Consultation; Data Usage and Analysis; Text Mining and Analysis; Data Management Planning; Metadata Services; Digitization Services 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 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.

**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, phone and email services; remote access to research materials such as electronic books, journals and databases.

**Institutes, Centers, and Laboratories.** The many and diverse institutes, centers, and laboratories maintained by the University are an indication of the spectrum of scholarly interest that students are able to join in and profit from.

Institutes, centers, and specialized research laboratories at Notre Dame include the Helen Kellogg Institute for International Studies, the Joan B. Kroc Institute for International Peace Studies, the Keough-Naughton Institute of Irish Studies, the Erasmus Institute, the Nanovic Institute for European Studies, the Institute for Latino Studies, the Medieval Institute, and the Radiation Laboratory. Other institutes, centers, and similar entities are the Center for Environmental Science and Technology (CEST); the Center for Advanced Scientific Computing; the Center for Astrophysics at Notre Dame University (CANDU); the Center for Applied Mathematics; the Center for Molecularly Engineered Materials; the Center for Civil and Human Rights; the Center for Continuing Education; the Center for Philosophy of Religion; the Center for Research in Business, embracing the Center for Business Communication, the Center for Ethics and Religious Values in Business, and the Center for Research in Banking; the Center for Social Concerns; the Center for the Study of Contemporary Society, which embraces the Gerontological Research Center, the Laboratory for Social Research, the Multinational Management Program, and the Philosophic Institute; the Charles and Margaret Hall Cushwa Center for the Study of American Catholicism; the Ecumenical Institute (Jerusalem); the Energy Analysis and Diagnostics Center; the Center for Nano Science and Technology; the Environmental Research Center

(UNDERC); the W.M. Keck Center for Transgene Research; the Walther Cancer Research Center; the Institute for Church Life; the Center for Ethics and Culture; the Institute for Scholarship in the Liberal Arts; the Jacques Maritain Center; the Reilly Center for Science, Technology and Values; the Urban Institute for Community and Educational Initiatives; the Thomas J. White Center for Law and Government; and the William and Katherine Devers Program in Dante Studies.

Other laboratories include the Hessert Center for Aerospace Research, the Air and Water Quality Analysis Laboratory, the Aquatic Biology Laboratory, the Biofluid Mechanics Laboratory, the Catalysis Laboratory, the Fluid Dynamics Laboratory, the Bernard J. Hank Family Environmental Research Laboratory, the LOBUND Laboratory, the Parasitology Laboratory, the Solid State Material and Devices Laboratory, the Vector Biology Laboratory, and the Zebrafish Research Facility. These research centers contain specialized facilities and equipment.

**Research.** The University receives more than \$119 million in sponsored research and sponsored program funds annually. Active programs of scholarly work occur in discipline-oriented departments in the humanities, fine arts, science, social science, engineering, law, and business areas of the University. In addition, University institutes and centers facilitate research across departmental lines.

The Office of the Vice President for Research is responsible for assisting faculty in various aspects of sponsored program activity, technology transfer, and research compliance. It reviews and transmits all formal proposals, monitors the status of proposals, negotiates contracts and grants, accepts awards for the University on behalf of faculty members, and is responsible for the administrative management of all grants, contracts, and cooperative agreements supporting research, training, service, and equipment. The Office of the Vice President for Research also provides guidance in seeking external sponsored program support, assistance in proposal and budget preparation, and support in all areas of electronic research administration, research compliance, and technology transfer.

The Office's website is designed to assist faculty from all academic units in the identification of funding sources. Current issues related to sponsored program activity as well as proposal preparation and award management are also highlighted.

Inquiries regarding this information should be addressed to the Office of the Vice President for Research, 317 Main Building; <http://or.nd.edu/>.

**Snite Museum of Art.** The museum features collections that place it among the finest university art museums in the nation.

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

## ADMISSION

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

The critically acclaimed John D. Reilly Collection of Old Master to 19th-Century Drawings includes examples by Tintoretto, Tiepolo, Oudry, Fragonard, Ingres, Gericault, Miller, and Degas. The Noah and Muriel Butkin Collection of 19th-Century French Art is the foundation of one of the museum's major strengths, featuring paintings and drawings by Corot, Boudin, Couture, Courbet, and Gerome.

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

The Janos Scholz Collection of 19th-Century European Photography contains some 5,500 images of persons and places taken during the first 40 years of camera use.

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

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

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

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

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

Loan exhibitions from major museums and private collections mounted by the Snite are offered regularly in the O'Shaughnessy Galleries, as is the annual exhibition of student art by candidates for MFA and BFA degrees. Special events and programs include lectures, recitals, films, and symposia held in the Annenberg Auditorium and in the galleries.

More information is available by calling the Snite Museum of Art at 574-631-5466, or by visiting their website at [sniteartmuseum.nd.edu](http://sniteartmuseum.nd.edu).

## Admission

This year we expect more than 17,500 students will apply for admission to Notre Dame's entering class. Most of the applicants will have the academic aptitude and preparation necessary to complete a degree program at the University. The Committee on Admissions will decide which applicants will be among the 2,000 included in the class. To understand how this is done, it is first necessary to know the procedure for applying to Notre Dame.

### ACADEMIC PREPARATION

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

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

For students intending to choose a major in the College of Arts and Letters or the Mendoza College of Business, *excluding* the arts and letters premedical/pre dental program and the combined arts-engineering program, the 16 units must be distributed as follows:

English	4
Algebra, advanced algebra, trigonometry, and geometry	3
Foreign language	2
History	2
Science	2
Additional English, mathematics, science, history, social studies, and language courses	3

For students intending to major in the College of Science, the College of Engineering, the School of Architecture, the arts and letters premedical/pre dental program or the combined arts-engineering program, the distribution must be:

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

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

### APPLICATION PROCESS

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

**Application.** New application forms are available in August of each year. The application is your opportunity to tell us about yourself. Include any information about your personal and academic circumstances that will help us evaluate your application.

Notre Dame is a member of the Common Application. Students may apply online at [commonapp.org](http://commonapp.org) or via our website: [admissions.nd.edu](http://admissions.nd.edu).

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

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

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

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

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

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

## ADMISSION

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

**DECISION AND NOTIFICATION PLANS**

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

1. *Early Action*—If you are an outstanding student with strong junior-year SAT or ACT scores, you should consider applying for Early Action admission. You must apply by November 1 and have all supporting documents in the Office of Admissions by that date. Early Action applicants will receive a decision letter before Christmas. If admitted under Notre Dame's Early Action procedures, you are not required to withdraw your other college applications and have until May 1 to confirm your enrollment at Notre Dame. You will receive financial aid consideration under the same procedures as Regular Action applicants. The Committee on Admissions will defer decisions on some Early Action applicants until we can compare their credentials with those of the Regular Action applicants. We will mail a decision to the deferred applicants by early April. If you are denied admission under Early Action, that decision is final, and you *may not reapply* in Regular Action.

2. *Regular Action*—Most applicants choose this plan, which requires that you apply by January 1 and have all supporting documents in the Office of Admissions by that date. We will mail decision letters by early April.

**Early Action:**

Apply by November 1  
Decision before Christmas  
Confirm enrollment at Notre Dame by May 1

**Regular Action:**

Apply by January 1  
Decision by early April  
Confirm enrollment at Notre Dame by May 1

**Deposits.** If admitted, you must confirm your intention to enroll by submitting a \$500 advance payment by May 1. This enrollment deposit is not refundable.

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

**The Campus Visit.** We welcome visits from prospective applicants. Our staff members meet with groups of students and parents to discuss admissions policies and procedures, the First Year of Studies program,

degree programs, student life, financial aid, and other topics of interest.

Appointments for weekday sessions are available from March through early December. Appointments for Saturday morning sessions are available from early September to late April. You should call our office for an appointment at least two weeks in advance of your visit. Campus tours are available following information sessions when classes are in session and on most weekdays of the summer. Be sure to call us for an appointment before you confirm any travel plans. Our telephone number is 574-631-7505. Appointments may also be made online at [admissions.nd.edu](http://admissions.nd.edu).

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

**THE SELECTION PROCESS**

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

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

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

**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 Office for Students with Disabilities (OSD) and providing information that documents his or her disability. Individual assistance is provided in selecting the services that will provide access to academic programs and facilities of the University.

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

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

For more information, contact the Office for Students with Disabilities at 574-631-7157 or 574-631-7173 (TTY).

**INTERNATIONAL STUDENTS**

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

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

International students wishing to apply for our limited need-based financial assistance must complete



## FEES AND EXPENSES

both the *Certification of Finances* and a *CSS Foreign Student Aid Application*. Based upon a review of academic credentials, financial need, and availability of scholarship resources, a student may be considered for financial assistance. Financial aid packages may include student loans, student employment, and University scholarship assistance.

To avoid potential problems with international mail, we urge students living outside the United States to apply online via the Common Application website, [commonapp.org](http://commonapp.org), and to submit all other application materials by courier service.

### TRANSFER ADMISSION

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

To be eligible for an undergraduate degree, you must complete a minimum of 50% of the degree credit hours at the University (not less than 60 credit hours) and a minimum of 75% of the degree credit hours (not less than 90 credit hours) must be earned after high school graduation through college and university courses. Please consult the Academic Code for details. Please note: Because of enrollment limitations, Notre Dame does not accept transfer applications for the Mendoza College of Business or the School of Architecture. We do not anticipate a change to this policy in the foreseeable future.

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

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

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

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

Please contact us to request the appropriate application form if you are interested in applying for transfer admission. Write to:

Office of Undergraduate Admissions  
Attention: Transfer Admissions Committee  
220 Main Building  
University of Notre Dame  
Notre Dame, IN 46556-5602

Students may apply online via our website: [admissions.nd.edu](http://admissions.nd.edu).

## Fees and Expenses

In the undergraduate colleges, the University is essentially a residence school for full-time students. As many students as accommodations will allow are housed in the campus residence halls. First-year students are obliged to live on campus. Permission to live off campus must be obtained from the dean of students. The fees listed below are for the academic year 2013–14 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 2013–14 ranges from \$28,558.50 to \$28,808.50 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 entertainments in Washington Hall and DeBartolo Performing Arts Center; the use of the Rockne Memorial, the Joyce Center, the Rolfs Sports Recreation Center, 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.

*\*Rooms are available in 30 residence halls. A security deposit of \$50 is required as a room reservation guarantee and for any damages that may be caused by the campus resident student. The deposit is refundable upon graduation or departure from the University after review and approval by the Office of Housing.*

**Off-Campus Student.** The tuition and fees for the full-time off-campus student is \$22,302.50 per semester for the academic year 2013–14, 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 (daily student newspaper): \$6 per semester.

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

The technology fee provides partial funding for the University's enterprise-wide technology infrastructure, which provides all students access to the Internet, e-mail, courseware, campus clusters, ResNet, 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 care and counseling/mental health assistance, alcohol and drug education programs, and health-education and wellness programs. This fee provides partial funding to address increasing student health and wellness needs, along with funding to maintain health facilities.

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

At the beginning of the academic year, the opportunity is provided to show proof of personal health insurance coverage. In the event such proof is not presented, the student will remain on the plan and the charge for the premium will be placed on the student's account. The last date to waive from the University Student Insurance Plan is September 15, 2013.

Information regarding the University-sponsored plan is mailed to the student's home address in July and is also available online at: <https://uhs.nd.edu/insurance-billing/>. Additional information is available in University Health Services by calling the Office of Insurance and Accounts at 574-631-6114.

The cost of the premium for the 2013–14 academic year is \$2,148.

## STUDENT FINANCIAL AID

**Payment Regulations.** IRISHPAY is the University's online student account 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 mid-July; the spring statement is issued in early December. These statements list basic semester charges for tuition, fees, and room and board. 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.

The University does not accept credit card payments. Remittance should be made payable to the University of Notre Dame. 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.

**Withdrawal Regulation.** Any graduate, law, graduate business\*, or undergraduate student who at any time within the school year wishes to withdraw from the University should contact the Office of the Registrar. To avoid failure in all classes for the semester and to receive any financial adjustment, the withdrawing student must obtain the appropriate clearance from the dean of his or her college and from the assistant vice president for Residence Life.

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

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

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

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

This Withdrawal Regulation may change subject to federal regulations. Examples of the application of

the tuition credit calculation are available from the Office of Student Accounts upon request.

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

**Payment Plan for Budgeting Educational Expenses.** The University makes available an interest-free monthly payment plan administered by Sallie Mae. This plan allows families to make payments over a 9- or 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 \$40. For additional information or to enroll in the plan, call Sallie Mae toll-free at 877-282-5933 or visit their website at: [tuitionpay.salliemae.com/nd](http://tuitionpay.salliemae.com/nd).

## 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, a broad array of financial products and services, and payment plans, to assist in helping to make a Notre Dame education affordable for all families.

**Principles.** Notre Dame subscribes to the principles of student financial aid administration as endorsed by the College Scholarship Service (CSS) 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.

Among the many myths that exist about the financial aid process, perhaps the most common is that which claims that only the low-income family is eligible for financial aid. Unfortunately, as a result, many students do not even apply for aid because it is assumed that the family income is too high. Although income is an important factor in determining a family's ability to pay for college, it is only one of the many factors considered. The size of the family, age of parents, number of family members in college, assets and liabilities, and private school costs are also considered.

Equally significant in determining need is the cost of attending an institution. The same student may have adequate family resources for attendance at a public institution but may show substantial need at a higher-cost institution, such as Notre Dame. Those families feeling the need for financial assistance are encouraged to investigate the possibilities outlined herein.

Inherent in the concept of need is the premise that the primary responsibility for financing a college education lies with the family. Notre Dame assumes that families will contribute to the student's education to the extent they are capable.

The difference between the family contribution and the student's total collegiate expenses for a given year is *financial need*. Another way of expressing this concept is outlined below:

$$\begin{array}{r} \text{Cost of Attendance} \\ - \text{Family Contribution} \\ \hline = \text{Financial Need} \end{array}$$

**Cost of Attendance.** The estimated average 2013–2014 Notre Dame undergraduate student expense budget includes:

Direct Costs	
Tuition and Fees	\$44,605
Room & Board*	12,512
<b>Total</b>	<b>\$57,117</b>

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

*\*Typical residence hall accommodations provide for housing with one or more roommates. The current cost of a single room (no roommate) is approximately \$500 more annually.*

Because of its national student body traditionally enrolled at the University, the transportation allowance will generally range currently from a minimum of \$500 to about \$1,000 with \$750 representing the approximate midpoint.

**Family Contribution.** 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. Students seeking financial aid will be expected to contribute toward their educational expenses. This self-help may include resources from a portion of their own assets, as well as earnings resulting from work prior to and during their enrollment at Notre Dame. In a very real sense, students who borrow also contribute to their costs from their future earnings.

**Financial Need.** Financial need is the difference between the estimated cost of attendance for the school year and the estimated family contribution. 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 a financial aid package that is designed to meet the demonstrated financial need of a student through our need-based

## STUDENT FINANCIAL AID

aid programs. In most cases this may include opportunities for scholarships, loans, and/or work. The total financial aid received by a student may not exceed the total cost of attendance.

**Financial Aid Application Process.** The CSS/Financial Aid 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](http://fafsa.gov) and should be filed between January 1 and February 15 for prospective first-year students, January 1 and April 25 for continuing students, and January 1 and March 31 for prospective transfer students. The federal school code for identifying Notre Dame on the FAFSA is 001840.

The PROFILE is available at [collegeboard.com](http://collegeboard.com) and should be filed between January 1 and February 15 for prospective first-year students, January 1 and April 25 for continuing students, and January 1 and March 31 for prospective transfer students. Notre Dame's CSS code for the PROFILE is 1841.

The University of Notre Dame participates in the College Board's *Institutional Documentation Service (IDOC)* which allows students to submit one packet of supporting documentation to IDOC rather than mailing individual documents to each participating institution to which a student has applied for admission.

CSS/Financial Aid PROFILE applicants will receive communication directly from IDOC regarding the submission of supporting documentation. Families should be prepared to submit this supporting documentation to IDOC. The priority deadline for prospective students is March 1, and April 30 for continuing students and prospective transfer students.

Priority consideration will be given to students who meet the FAFSA and PROFILE filing deadlines. Additional consideration may be given to late applicants if funding permits.

**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. Such documents may include copies of federal income tax returns and W-2 forms. The Office of Financial Aid reserves the right to request additional documentation and/or clarification of a family's financial situation. For purposes of verification, the University currently participates in the Federal Quality Assurance Program.

Because the amount of financial aid awarded to an individual reflects the family financial situation, the University, as a matter of policy, does not publicly announce the amount of aid awarded. All information received by the Office of Financial Aid is treated as confidential.

All forms of aid awarded by the University are subject to adjustment based upon additional awards received by the student in excess of the established need. Students receiving aid from the University of Notre Dame must notify the Office of Financial Aid of all other forms of educational assistance from financial aid sources other than those directly administered by the office.

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

Prospective first-year students wishing to be considered for limited need-based financial assistance must first complete an International Certification of Finances along with a CSS International Student Financial Aid Application. Based upon a review of academic qualifications, financial need, and availability of student aid resources, an applicant may be considered for financial assistance, including a self-help component of a student loan and student employment, along with University scholarship assistance. The Certification of Finances and the CSS International Student Financial Aid Application will be reviewed along with the student's application for admission. These documents should be submitted to the Office of Undergraduate Admissions.

### 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.

**Notre Dame Scholarships.** All students accepted for admission, who have completed the financial aid process as outlined above, are automatically considered for University scholarships. The level of University assistance is first based on demonstrated financial need, and then academic performance, and will thus vary from student to student.

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

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

Students accepting University scholarships authorize Notre Dame to release confidential information to scholarship donors and Notre Dame Clubs by signing a Scholarship Information Release Form (SIRF). In addition, students agree to write a letter of appreciation to their scholarship donor(s), upon request.

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

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

**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.

## STUDENT FINANCIAL AID

The FAFSA serves as the application for the Pell program. Eligibility is determined by the Federal Methodology formula uniformly applied to all applicants. After applying, the student will receive a Student Aid Report (SAR) from the federal government. Eligible students will be notified by the University's Office of Financial Aid. In 2013–14, the grants range from \$600 to \$5,645.

**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. SEOG awards range from \$100–\$4,000 annually.

**State Scholarships and Grants.** Although programs vary from state to state, all applicants are encouraged to seek information about the possibility of obtaining a state scholarship/grant as a student at Notre Dame. Details regarding application processes, eligibility requirements, amounts, etc., vary from state to state. Among the states that currently award scholarship/grant assistance to Notre Dame students are Indiana, Pennsylvania, Rhode Island, and Vermont.

**Military Scholarships.** The University of Notre Dame, in cooperation with the military services, offers Army, Navy, Marine Corps, and Air Force Reserve Officers' Training Corps (ROTC) programs for interested and qualified students. Satisfactory course completion leads to an Officer's Commission upon graduation from the University.

ROTC scholarships are available on a competitive basis for both men and women. Scholarships may be awarded to offset up to the full cost of tuition, books, and fees, plus an in-school subsistence.

Scholarships are awarded on merit and personal qualifications. Applications must be filed during the fall semester of the student's high school senior year.

Application forms and further program descriptions are available from high school counselors, military recruiting officers, and ROTC departments at any participating college or university.

First-year students and upperclassmen are eligible to voluntarily enroll in the three-year ROTC college programs at Notre Dame and compete for a limited number of scholarships within the units.

For more information, see [financialaid.nd.edu/rotc](http://financialaid.nd.edu/rotc) or contact: ROTC (Army, Navy, and Marine Corps or Air Force), University of Notre Dame, Notre Dame, IN 46556.

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

**Private Scholarships.** The receipt of any scholarship or grant not listed in the original FAN must be reported to the Office of Financial Aid as soon as the student is notified of the award. Since Notre Dame meets the student's demonstrated financial need, the receipt of funds not listed in the FAN may result in an adjustment to the financial aid award. If appropriate, a revised FAN will be sent to the student noting receipt of the additional award and the adjustment to the student's financial aid award.

## STUDENT EMPLOYMENT

Part-time employment opportunities, including those offered through the need-based Federal Work-Study and Paid Community Service Programs as well as other programs, are intended to help the student pay for personal and other related educational expenses.

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

Hourly rates vary depending on the job requirements. The basic hourly wage for the 2013–14 academic year is \$7.50. Students are paid on a biweekly basis via a direct deposit to their personal checking account for the number of hours worked.

Students interested in securing part-time employment are encouraged to visit "Obtaining a Student Job" on the Office of Student Employment website at [studentemployment.nd.edu](http://studentemployment.nd.edu). The online JOBoard is updated as new positions become available.

## LOANS

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

**Federal Perkins Loan.** The Federal Perkins Loan is a need-based loan made by the University. The interest rate is fixed 5% and there are no origination fee or insurance fees. The loan is interest free while the student is enrolled in school on at least a half-time basis and during the nine-month grace period following enrollment. Repayment on both principal and interest beginning nine months after the student ceases to be enrolled in school on at least a half-time basis, generally extending over a 10-year period. There is a \$5,500 annual loan limit; and \$27,500 maximum aggregate undergraduate borrowing limit;

the University typically limits the annual award to \$4,000.

Perkins borrowers are eligible for loan cancellation for teacher service at low-income schools and under certain other circumstances specified in the law. Students may defer repayment of the loan while enrolled (at least half-time) at a postsecondary school.

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

**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. Private loans are not eligible for loan consolidation programs made available for federal student loans. Interest rates, fees (both at the time of borrowing and at repayment), credit checks, and annual and aggregate loan limits require careful evaluation by students as consumers. As always, taking on debt for any reason should be done deliberately and only for amounts needed. Additional information may be obtained from the Office of Financial Aid or its website.

## OTHER

**Monthly Payment Plan.** The University makes available an interest-free monthly payment plan administered through Sallie Mae. This plan allows families to make payments over a 9- or 10-month period versus making two larger payments at the beginning of each semester or borrowing.

For additional information or to enroll in the plan, call Sallie Mae at (877) 282-5933 or visit their website at [tuitionpay.salliemae.com/nd](http://tuitionpay.salliemae.com/nd).

**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. If a PLUS Loan is denied, the student may request additional unsubsidized Direct Loan funds by contacting the Office of Financial Aid. For additional information on the terms and conditions of Direct Loans visit [studentloans.gov](http://studentloans.gov). *Note: program is subject to federal legislative changes.*

## STANDARDS OF PROGRESS FOR RECIPIENTS OF FINANCIAL AID

## Standards of Progress for Recipients of Financial Aid

The United States Department of Education (Higher Education Act of 1965, as amended) 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 whose program is one academic year in length or shorter will be evaluated at the end of each enrolled term.

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	1.75
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.

### 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 and state aid 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 will have 10 days to 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 a student does not complete the appeal process within 10 days of notification or if an appeal is denied, he/she will be notified via University email and remain ineligible for financial assistance until satisfactory academic progress is reestablished. Appeals will not be accepted after 10 days and the student will be responsible for all charges on their University account. Financial aid will not be provided retroactively.

## Center for Social Concerns

The Center for Social Concerns provides students with a wide array of opportunities for engagement through community-based learning, community-based research, and service addressing issues of poverty and injustice. Students examine these social, moral, and ethical issues from a variety of perspectives through the lens of Catholic social Teaching.

- Students chose from seminars and programs built around national and international immersion experiences that fall into two categories: fall, winter, and spring break seminars such as the Appalachia Seminar and Urban Plunge; and Summer Service Learning Projects.
- Students interested in community-based research work with faculty and community partners, as part of an existing course, an internship, a senior thesis, or special studies class on a research project that aims to generate social action and social change.
- The Center for Social Concerns partners with over 60 social service and advocacy organizations to offer students diverse volunteer and learning opportunities.
- Staff from the Center work with student clubs and groups to facilitate collaboration and volunteer opportunities with community organizations.
- Students participate in leadership development and senior transition programs and seminars to help with career discernment (currently 10 percent of seniors enter a year or more of full-time service or civic engagement following graduation).
- The Center cosponsors justice education events, workshops, and panel discussions with campus partners.
- Visit the Center for Social Concerns at <http://socialconcerns.nd.edu/>

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Center for Social Concerns*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## 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. First-year students enrolled in any of the three ROTC programs are exempted from the University's requirement for physical education.

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

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

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

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

### MILITARY SCIENCE

*Chair and Professor:*

Lt. Col. John Polhamus, USA

*Instructors:*

Mr. Tim Dukeman

Mr. Adam Henkaline

Msg. Marshall Yuen, USA

Sfc. Matthew Lemon

As one of the premier Army ROTC programs in the country, the department's mission is to educate, train, develop, and inspire participants to become officers and leaders of character for the U.S. 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 students/cadets and to allow them to practice the

essential components of leadership: influencing, acting, and improving. Participants become members of the Fightin' Irish Cadet Battalion and complete a planned and managed sequence of classroom courses and practical exercises intended to develop each participant into what an 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 and focuses on the role of Army officers in the preservation of peace and national security, with particular emphasis placed on ethical conduct and the officer's responsibility to society to lead, develop themselves and others, and achieve success. The experience culminates ideally with participants earning commissions as second lieutenants in the Active Army, Army Reserve, or Army National Guard. As an organization committed to lifelong learning, participants may elect to pursue one of the Army's numerous opportunities for follow-on postgraduate study as well.

### Student Awards and Prizes.

*The Dixon Award.* A cash award presented to an outstanding senior who has displayed exceptional performance during the annual Dixon Challenge.

*George C. Marshall Award.* An award given annually to the top cadets in cadet command. Winners participate in national summer with some of nation's highest ranking leaders.

*Commander's Award.* A U.S. officer's sabre given to the two cadet battalion commanders of the year by the Notre Dame Army ROTC Battalion Commander.

*Patrick Haley Award.* A wristwatch presented annually to the cadet who attains the highest academic grade point average.

*Dr. Michael McKee Award.* A cash award presented each year to the outstanding member of the battalion's Drill Team and/or Honor Guard.

### COURSE DESCRIPTIONS

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

## RESERVE OFFICERS TRAINING CORPS PROGRAMS

**NAVAL SCIENCE***Chair and Professor:*

CAPT C.E. Carter, USN

*Associate Professor:*

CDR E.N. Teuscher, USN

*Assistant Professors:*

Maj. J.L. Schiller, USMC

LT S.M. Smith, USN

LT G.S. Bennett, USN

LT M.A. Hood, USN

LT C.A. Williams, USN

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

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

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

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

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

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

*The Captain John A. McGurty Jr., USNR, 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 Chicago Navy League Award.* A sword is awarded to one of the top graduating Navy Option Midshipmen who exemplified the characteristics of a naval officer while filling one of the senior midshipman staff positions during the past year.

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

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

**COURSE DESCRIPTIONS**

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Naval Science (ROTC)*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

**AEROSPACE STUDIES***Chair and Professor:*

Colonel Frank J. Rossi, USAF

*Assistant Professors:*

Captain Mark S. Williams, USAF

Captain Michael T. Moffett, USAF

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

of the Air Force ROTC program students are commissioned as second lieutenants in the United States Air Force. Following commissioning there are excellent opportunities for additional education in a wide variety of academic fields.

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

**Student Awards and Prizes.**

*The Notre Dame Air Force Award*, and Air Force officer's sword, are presented to the top graduating senior in Air Force ROTC.

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

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

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

**COURSE DESCRIPTIONS**

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Air Force-Aerospace Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

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

## INTERNATIONAL STUDIES

## International Studies

International Studies offers over 40 study abroad programs in more than 20 countries in a variety of academic year and summer programs.

Since 1964, Notre Dame has made it possible for students to earn credits toward graduation in international study 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.

Without delay in graduation, international study programs make a unique contribution to the excellence of liberal education in the undergraduate colleges and frequently have proved an asset in career development. Students earn Notre Dame credit for courses taken on Notre Dame programs and their grades are included in the Notre Dame GPA. During the semester abroad, students must carry a course load of at least 15 credits.

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

Admission into most of the programs can be quite competitive and students are encouraged to apply to more than one program. Offers of admission are made in accordance with program requirements, at the discretion of the International Studies staff in consultation with faculty and staff of the University. Students considering more than a single semester or academic year program should carefully review their majors and minors to ensure that such study does not delay the completion of graduation requirements. Students who have participated in or been selected for an off-campus program may receive a lower priority in the selection process of a second program.

Participation in a summer off-campus program does not affect a student's application to a semester or yearlong program.

Notre Dame offers semester or yearlong programs around the world. In Europe, students may apply to go to Angers or Paris, France; Berlin or Heidelberg, Germany; Athens, Greece; Dublin, Ireland; Bologna or Rome, Italy; Alcoy or Toledo, Spain; Geneva, Switzerland; London, St. Andrews, or Oxford, United Kingdom. Undergraduates can study in Puebla, Mexico; Salvador da Bahia or São Paulo, Brazil; or Santiago, Chile for a Latin American experience. They can participate in programs in Amman, Jordan; Cairo, Egypt; Jerusalem, Israel; Dakar, Senegal; Kampala, Uganda; or in Fremantle and Perth, Australia. Notre Dame also offers semester-long programs in Nagoya and Tokyo, Japan; in Seoul, South Korea; in Shanghai, Beijing, and Hong Kong, China; and in Moscow, St. Petersburg, and Vladimir, Russia.

International Studies offers summer programs for students who have completed at least one year of studies at Notre Dame in London, United Kingdom; Dublin, Ireland; and Toledo, Spain. Several faculty-led programs are available: Paris, France; China Business & Culture; Taipei, Taiwan; and an African Peace and Conflict Studies Program in Uganda and Rwanda. Summer programs have been conducted in Paris, France; Cape Town, South Africa; Taipei, Taiwan; Rome, Italy; Granada, Spain; and Jerusalem, Israel as well as an African Peace and Conflict Studies Program in Uganda and Rwanda. The locations of the faculty-led summer programs may vary each year.

Programs are also sponsored by the School of Architecture in Rome (yearlong) and by the College of Engineering in London (summer) and Alcoy, Spain (summer).

Students may also participate in a St. Mary's College study-abroad program, in accordance with the policy outlined on the International Studies website.

Candidates for Amman, Angers, Beijing, Berlin, Bologna, Dakar, Geneva, Nagoya, Paris, Puebla, Rome, Russia programs, Salvador da Bahia, Santiago, São Paulo, Shanghai, Tokyo, and Toledo must demonstrate skills in the language of the country sufficient 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 English in Athens, Cairo, Dublin, Jerusalem, Perth, Fremantle, London, St. Andrews, Oxford; Italian and English in Rome; Japanese and English in Nagoya and Tokyo; Chinese and English in Beijing, Shanghai, and Hong Kong; French and English in Dakar; French in Angers, Paris, and Geneva; Spanish in Toledo, Puebla, and Santiago; Portuguese in Brazil; Italian in Bologna; Russian in Russia; and German in Berlin.

Students earn Notre Dame credit for courses taken abroad and grades are included in the Notre Dame GPA. Some courses taught abroad will fulfill core University requirements such as theology, philosophy, history, fine arts, literature, or social science. Students are required to take 15 credit hours per semester in the study abroad programs.

An approved social science course in the field of anthropology, psychology, or sociology will complete a behavioral science requirement in the Mendoza College of Business.

For major credit in any college department, the student must consult with the departmental advisor. Programs may sometimes be cancelled due to circumstances beyond the control of the University.

Students with compelling academic reasons for participating in non-Notre Dame programs are eligible to apply for a leave of absence 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 where Notre Dame offers its own programs.

Course descriptions for hundreds of courses taught in the following programs are available on the International Studies website at <http://www.nd.edu/~ois/course/?op=sf>

### ALCOY, SPAIN PROGRAM

**Spring Semester Program**  
*Universitat Politècnica de València*

### AMMAN, JORDAN PROGRAM

**Academic Year or Semester Program**  
University of Jordan

This program is offered in conjunction with the Council for International Educational Exchange (CIEE). Students enroll in this Arabic language program at the University of Jordan. Housing options include 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. Detailed program information is available at the International Studies office, 105 Main Building or by visiting the CIEE website at <http://www.ciee.org/study-abroad/>

### ANGERS, FRANCE PROGRAM

**Academic Year or Semester Program**  
*Université Catholique de l'Ouest (UCO)*

The Angers program is open to sophomores and juniors in all colleges. Many Angers students decide to pursue a first or second major in French. Declared and prospective French majors must consult with the Department of Romance Languages and Literatures for an advising sheet before they participate in the program.

An academic year of two semesters begins after a month-long language-intensive summer session, the *préstage*. Most Angers students take the bulk of courses within the *Centre International d'Etudes Françaises* (CIDEF), UCO's language institute. CIDEF students with advanced French language skills may also register for a *cours universitaire* through one of the institutes at UCO. Studio art majors may pursue course work at the *École Supérieure des Beaux Arts d'Angers*, and in a given year, a limited number of business courses may be available at the *École Supérieure des Sciences Commerciales d'Angers* (ESSCA), an affiliate of UCO.

An alternate academic year track is open to a limited number of students with high levels of proficiency in French. After the month-long *préstage*, these students matriculate directly in the UCO and take courses alongside their French student counterparts. All instruction is in French.



## INTERNATIONAL STUDIES

**ATHENS, GREECE PROGRAM****Semester or Academic Year Program**

College Year in Athens

Sophomores and juniors study with other international students at the College Year in Athens. Classes are taught in English and the program is organized in two curricula: Ancient Greek Civilization and East Mediterranean Area Studies. Through the Ancient Greek Civilization track, students amplify their knowledge of ancient Greece and deepen their understanding of Greece's fundamental contribution to the development of Western civilization. The East Mediterranean Area Studies curriculum focuses attention on Southeast Europe, West Asia, and the Middle East in the time period between the founding of Constantinople (A.D. 330) to the present. It is an area of unusual importance in geopolitics, where Europe intersects with Asia and Africa and one whose problems and complexities, rooted in the past, pique the interest of students of history, politics, and international affairs.

**BEIJING, CHINA PROGRAM****Semester or Academic Year Program**

Peking University

This option is offered in conjunction with the Council for International Educational Exchange (CIEE). Students may enroll in this intensive Chinese language program at Peking University. Organized group activities complement the classroom experience. All classes are taught in Mandarin Chinese with elective area studies courses offered in English each semester. The Beijing program is strongly recommended for Chinese majors. Detailed program information is available at the International Studies office, 105 Main Building or by visiting the CIEE website at <http://www.ciee.org/study-abroad/>

**BERLIN, GERMANY PROGRAM****Academic Year or Semester Program***Freie Universität-Berlin*

The Berlin Program is part of the Consortium for German Studies (BCGS), which is 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 *Freie Universität*. *Freie Universität Berlin* offers a wide

range of courses in the humanities, social sciences, and natural sciences. All coursework will be in German.

**BOLOGNA, ITALY PROGRAM****Academic Year or Spring Semester Program**

University of Bologna

Students matriculate in the University of 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 in 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.

**CAIRO, EGYPT PROGRAM****Semester or Academic Year Program**

American University in Cairo (AUC)

Students may enroll during their junior year of college. Students from all colleges are eligible for participation. Students select courses from the general course offerings of AUC and are integrated into classes with AUC degree-seeking students. Cairo is an ideal base from which to explore the rich heritage of Arab and Islamic culture. All classes are offered in English, but AUC also offers students opportunities and options for learning the Arabic language.

**DAKAR, SENEGAL PROGRAM****Spring Semester Program**

Students who are interested or majoring in French/Francophone studies, African studies, international relations, or development studies and are seeking an opportunity to live and study in a French-speaking West African country considered by many to be one of the most developed and democratic nations in that region, should consider the Dakar Program. The Council on International Education Exchange (CIEE) administers this program.

Classes are conducted at CIEE Study Center in *Amitié III* neighborhood near restaurants, shops, cultural centers, and the largest public university in Senegal. The program offers students the opportunity to live with a host family and study in a French-speaking West African country, to introduce them to Senegalese society, and to consider such issues as education, women's roles, the impact of

Islam and development and globalization from a West African perspective.

Applicants must be Junior-level students with at least 2 semesters of college-level French or equivalent and are required to take 15 credits with 3 required courses and 2 elective courses. Senegalese professors teach program courses. For listing of courses offered, check the ISP website.

**DUBLIN, IRELAND PROGRAM****Semester or Academic Year Program**

University College Dublin (UCD), Trinity College

The Dublin program is open to juniors in arts and letters, business, engineering, and science for a semester or a year at University College Dublin and for the academic year only at Trinity College. Students will enroll in courses in their majors at the two Universities and will also take courses at Notre Dame's Keough-Naughton Center. For course listings at the Irish universities, check the International Studies website.

Prof. Kevin Whelan offers the course "Introduction to Ireland." This course is mandatory for all program participants. The Notre Dame Center may also offer an Irish Literature course during certain semesters. Students are required to take 15 credits per semester of study and will live in dormitories at the respective Universities with Irish and other international students.

**FREMANTLE, AUSTRALIA PROGRAM****Semester Program**

University of Notre Dame Australia

Students in the colleges of business and arts and letters will enroll in courses at the University of Notre Dame Australia (NDA) through this program. Students enroll in five courses (15 credits) either semester in any combination depending on their major/college requirement and individual need. A list of course offerings for the fall normally is available around the end of March and for the spring term around the end of September.

A listing of approved courses offered in previous semesters is available on the ISP website. Students in the Fremantle program are required to take ANTH 34392 Australian History and Society (3 credits). In the fall term, students must also take BAUD 34120 Business in Asia, also cross-listed as ECON 34781 (3 credits).

**GENEVA, SWITZERLAND PROGRAM****Spring Semester Program**

University of Geneva

Through Boston University's Geneva-Physics program, Notre Dame students will have the opportunity to study at the University of Geneva (UNIGE) and the European Organization for Nuclear Research (CERN) in Switzerland. The

## INTERNATIONAL STUDIES

program, which combines coursework in quantum physics and electrodynamics at UNIGE and directed research at CERN, is open to physics majors who have completed at least two semesters of college-level French or the equivalent. Additionally, students will be required to complete a specially designed French–language tutorial before going to Geneva.

**HONG KONG, CHINA PROGRAM****Academic Year or Semester Program**

Chinese University of Hong Kong (CUHK)

The CUHK program is open to juniors and is particularly suited to students in arts and letters, 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.

**Semester Program**

University of Hong Kong (HKU)

The HKU program is open to juniors who wish to study in Hong Kong for one semester. The program is suited for students in 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. With a student body of over 22,000 undergraduates and postgraduates, it has a bilingual, bicultural population of local and international students and scholars.

**JERUSALEM, ISRAEL PROGRAM****Spring Semester Program**

Tantur Ecumenical Institute

Notre Dame's program in Jerusalem is located at Tantur on a hilltop on the road from Jerusalem to Bethlehem. Students will take required courses at Tantur focusing on ecumenism and interreligious dialogue, a modern history of the Israeli-Palestinian conflict, and the art and architecture of the Holy Land. Students will choose remaining classes from courses offered in English. The semester program also includes numerous excursions throughout Israel that enhance the material covered in the classroom.

**KAMPALA, UGANDA PROGRAM****Semester Program**

School for International Training

The program is designed to expose students to as many aspects of development in Uganda as possible. Students are required to enroll in all course offerings to get a better grasp of the socio-economic issues that affect development. The program combines course work with field research during which students identify topics of interest that they pursue for their final development practicum.

**LONDON UNDERGRADUATE PROGRAM****Semester Program**

Notre Dame London Centre

The London 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, 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 Notre Dame London Centre 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 residential facilities with supervision provided by the program. The semester enables students to combine serious academic study with the opportunity to live in Europe.

The London Undergraduate Program operates within International Studies. We encourage students interested in London studies for the regular academic year to direct further inquiries regarding location, staff, facilities, curriculum, and requirements to the London Program at 105 Main Building.

**MOSCOW, ST. PETERSBURG, AND VLADIMIR, RUSSIA PROGRAMS****Semester or Academic Year Programs**

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

**NAGOYA, JAPAN PROGRAM****Semester or Academic Year Program**

Center for Japanese Studies, Nanzan University

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

**OXFORD UNDERGRADUATE PROGRAM****Academic Year Program**

New College and Oriel College, Oxford University

The Oxford Program provides juniors in the colleges of science, engineering, and arts and letters the opportunity to study at New College or Oriel College, Oxford for a full academic year. Application is by invitation only. New College and Oriel College dictate the fields in which they will accept students each year. It is required that candidates have an overall GPA of 3.7 at the time of application.

While there, students participate in Oxford's celebrated tutorial system: Students work individually 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. Detailed program information is available at the International Studies office, 105 Main Building.

**PARIS, FRANCE PROGRAM****Spring Semester or Academic Year Program**

*Université Paris Diderot*

The University of Notre Dame has an exchange program with the *Université Paris Diderot* (Paris 7). Offered as a yearlong or a second-semester program, the Paris program is limited to students with a high level of French, an excellent grade-point average, and a major or supplementary major in French. Students will take courses in French on subjects in the arts, cinema, French language, and literature.

**Spring Semester or Academic Year Program**

*Institut d'Études Politiques de Paris*

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 second-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 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

## INTERNATIONAL STUDIES

from *Sciences-Po*, which is widely recognized in Europe and the United States.

### PERTH, AUSTRALIA PROGRAM

#### Semester Program

University of Western Australia

A special program has been developed for juniors in the colleges of Engineering and Science to enroll at the University of Western Australia (UWA) during the fall semester only. The program combines course work with an intensive field research program established in conjunction with several Australian mining and engineering companies. A spring semester option is possible for students whose schedule can accommodate it. All students should carry a minimum of 30 UWA points, which translates to about 12 to 15 Notre Dame credits. Course offerings are available on UWA's website: <http://handbooks.uwa.edu.au/> or on the International Studies website.

### PUEBLA, MEXICO PROGRAM

#### Semester or Academic Year Program

*Universidad Popular Autónoma del Estado de Puebla*

Students may participate in the program for an academic year or a semester. The program is open to students from all colleges at Notre Dame with the equivalent of four semesters or better in Spanish language. Notre Dame offers a pre-medical program in the fall semester, which includes the first semester of General Physics (taught in English) and internships with Mexican doctors. Fall students will study at the *Universidad Popular Autónoma del Estado de Puebla* (UPAEP). Spring students will have the opportunity to enroll in courses at the *Universidad Iberoamericana Puebla* (Ibero), and may also enroll in a variety of internship opportunities with a focus on business or the humanities. All participants in the Mexico program are required to enroll in one course with a focus on Mexican history or culture. Students will take 15 credit hours per semester.

### ROME, ITALY PROGRAM

#### Semester or Academic Year Program

John Cabot University (JCU)

Students from all colleges can enroll in classes at John Cabot University, an American university in Rome, which offers courses in art, business, classics, government, history, literature, philosophy, theology, and psychology. All courses are taught in English with the exception of Italian language classes. Many JCU courses have been approved by Notre Dame departments for major credit; however, students must consult with their department to confirm courses for their major and minor. All students are required to have at least one year's worth of Italian prior to departure and to take one Italian-language course during their semester or year in Rome. For a listing of all courses offered at John Cabot, check the International Studies website.

### ROME, ITALY ICCS

#### Semester Program

The Intercollegiate Center for Classical Studies (ICCS)

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. The 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, and acceptance into the Rome-ICCS Program is highly selective.

### SALVADORE DA BAHIA, BRAZIL PROGRAM

#### Semester or Academic Year Program

*Universidad Católica do Salvador*  
*Universidad Federal da Bahia*

International Studies offers this program in conjunction with the Council for International Educational Exchange (CIEE). The program begins with a five-week, intensive language and culture program (ILCP) held in Salvador da Bahia for the fall semester and São Paulo for the spring semester. During the ILCP, students are required to take an intensive Portuguese language class and the interdisciplinary core course titled "Contemporary Brazil." Students who are near-native speakers of Spanish may be placed in a "Portuguese for Spanish Speakers" course (offered based on enrollment).

For the remainder of the semester, students must enroll in two required courses: "Portuguese Language" and "Culture and Society: Bahia and Brazil." The remainder of the course load (two or three courses) is drawn from a combination of CIEE courses and/or the wide range of courses offered at the host universities.

### SANTIAGO, CHILE PROGRAM

#### Semester Program

*Pontificia Universidad Católica (PUC)*

All participants in the Chile program begin the semester with a two-to-three week language and cultural immersion pre-program in rural Chile. After the pre-program ends, students travel to Santiago, Chile where they enroll in classes at the *Pontificia Universidad Católica* (PUC). Students enroll in two or three classes at the PUC in addition to two mandatory core courses: "Spanish for Foreigners," and "Chilean Politics and Society." Many students also choose to apply to participate in a service-learning course entitled: "Approaches to Poverty and Development" which is taught at the *Universidad Alberto Hurtado*.

All students live with host families in Santiago who are carefully selected by Notre Dame's on-site staff. The fall semester runs from mid-July through mid-December and the spring program runs early February–mid-July.

### SÃO PAULO, BRAZIL PROGRAM

#### Semester or Academic Year Program

*Pontificia Universidad Católica de São Paulo*

This program is also offered in conjunction with CIEE. The program begins with a five-week, intensive language and culture program (ILCP) held in Salvador da Bahia for the fall semester and São Paulo for the spring semester. During the ILCP, students are required to take an intensive Portuguese language class and the interdisciplinary core course titled "Contemporary Brazil." Students who are near-native speakers of Spanish may be placed in a "Portuguese for Spanish Speakers" course (offered based on enrollment). The São Paulo program is open to qualified students in all majors, but may be of significant interest to students studying Portuguese, Brazilian Studies, Business, Latin American Studies, Poverty Studies, or Sociology. For the remainder of the semester, students must enroll in two required courses: "Portuguese Language" and the CIEE core course "Contemporary Brazil." In addition to the two required CIEE courses, students choose two or three electives drawn from the wide range of courses offered at PUC for which they meet the prerequisites.

### SEOUL, KOREA PROGRAM

#### Spring Semester or Academic Year Program

Yonsei University

The Seoul exchange program begins in Spring 2014 and is open to juniors. It is particularly suited to students in Korean Studies. Yonsei is a Christian private research institution with local and international students and scholars and is one of the oldest universities in South Korea. Yonsei receives students from over 290 academic institutions worldwide. Instruction is in Korean and students may also choose from many courses that are taught in English. While the majority of classes will be in Korean Studies, students may also choose courses from the various other faculties as well.

### SHANGHAI, CHINA PROGRAM

#### Semester or Academic Year Program

East China Normal University

International Studies 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. 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. Detailed program information is available at the International Studies website or at CIEE's website: [ciee.org/studyabroad](http://ciee.org/studyabroad).

### ST. ANDREWS, SCOTLAND PROGRAM

#### Spring Semester

University of St. Andrews

St. Andrews was founded around 1411 and bears the distinction of being Scotland's oldest and most prestigious university, ranking consistently among Britain's top five universities. St. Andrews is renowned for its academic strength in numerous disciplines, but is particularly distinguished in Medieval Studies. This program is open to students with a major, minor, or concentration in Medieval Studies or in the process of declaring their major or minor in Medieval Studies. Students will have to have completed, prior to departure, the Medieval Studies gateway course, "The World of the Middle Ages."

The program is also open to Psychology majors. Students will apply in the fall semester of their sophomore year to study at St. Andrews in the spring semester of their junior year. Qualified students are selected for interview based on applications, and participants are chosen by a selection committee for International Programs.

### TOKYO, JAPAN PROGRAM

#### Spring Semester

Sophia University

International Studies offers this option in conjunction with the Council on International Educational Exchange (CIEE). The Tokyo Program is open to sophomores and juniors who have completed a semester of Japanese. All students must take a Japanese language course and can choose from a wide variety of other courses offered in English including business, economics, history, literature, philosophy, and sociology. Students earn Notre Dame credit for courses taken in Tokyo, and grades are included in the Notre Dame GPA. Organized group activities complement the classroom experience. Detailed program information is available at CIEE's website: [ciee.org/studyabroad](http://ciee.org/studyabroad)

### TOLEDO PROGRAM

#### Semester or Academic Year Program

*Fundacion Ortega y Gasset*

The Toledo program is open to sophomores and juniors in all majors. Students may study for a semester or academic year in Toledo and all courses are taught in Spanish. Students must take five courses through the *Centro de Estudios Internacionales, Fundacion Ortega y Gasset*. A philosophy course is offered in the fall only; a theology course is offered in the spring. Credit-bearing internships are available in Toledo. Students may apply for internships in several

areas, including government, the arts, social service, and communications.

Credit toward a major must be approved by an advisor in the major department. Second semester and academic year students with advanced proficiency in Spanish may apply to do coursework at the *Universidad Castilla La Mancha* in Toledo.

### WASHINGTON, D.C. PROGRAM

The Washington Program has moved to the Rooney Center for the Study of American Democracy. For information on the program please see the Political Science section.

## Physical Education and Wellness Instruction

#### *Chair of Physical Education and Wellness Instruction:*

Hugh R. Page, Jr. (acting chair)

#### *Associate Professional Specialists:*

Michele Gelfman

Denise Goralski

Fran McCann

Diane Scherzer

Marisha Schmidt

Joshua Skube

#### *Assistant Professional Specialists:*

Stephanie Gaal

Nathan Piwowar

Joshua Scott

#### *Assistant Professional Specialist and*

#### *Assistant Athletic Trainer:*

William F. Meyer Jr.

#### *Visiting Assistant Professional Specialists:*

Stephen Bender

Oliver Jenkins

Judit Kovacs

The Department of Physical Education and Wellness Instruction promotes appreciation for the positive impact that life sport and wellness activities have on the whole person—mind, body, and spirit. Its integrative curriculum seeks to enhance the physical, intellectual, spiritual, and emotional growth of first-year students.

As a complement to physical education activities, the department offers a required course in Contemporary Topics for College Students. This course is designed to enhance understanding of various components of fitness and selected lifestyle issues such as stress management, nutrition, diversity, and relationships with others, that have an impact on the individual. Students will learn to formulate and implement their own fitness and wellness programs through self-testing, evaluations, exercises, and self-assessments.

The department believes that basic swimming skills are important for the student. A swim test will be administered at the beginning of the year to determine each student's ability.

Most students will be able to elect four of the following activities to complete their requirement. It is strongly recommended that activities from both the wellness and lifetime sports tracks be taken.

Aerobics/Step Aerobics

American Ballroom Dance

Aquatic Fitness

Badminton

Beginning Curling & Skating

Bowling

Contemporary Topics for College Students

Cycling

Fencing

First Aid

Introduction to Fitness

## INFORMATION TECHNOLOGIES

Golf  
 Handball  
 Hiking/Orienteering  
 Ice Skating  
 Latin Ballroom Dance  
 Living Mindfully  
 Personal Nutrition  
 Pickleball  
 Principles of Karate  
 Racquetball  
 Running for Fitness  
 Self-Defense  
 Skiing:  
   Cross Country  
   Downhill  
 Swimming:  
   Lifeguard Training  
 Tai Chi  
 Team Handball  
 Tennis  
 Ultimate Frisbee  
 Volleyball  
 Walking/Jogging  
 Wall Climbing  
 Weight Training  
 Yoga

All activities are offered at the beginning level; however, some activities are offered at an intermediate level. If the student has a physical disability and is unable to participate in activity classes, a specially designed program will be arranged. For further information, see our website at [pe.nd.edu](http://pe.nd.edu).

### COURSE DESCRIPTIONS

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

## Information Technologies

The Office of Information Technologies (OIT) provides a robust and highly reliable technology infrastructure that supports the University’s teaching, learning, research, scholarship, community service and administrative activities. Information technology services are designed to enable and empower, transform and benefit, and serve and support the entire Notre Dame community.

The OIT provides all Notre Dame students with an @nd.edu e-mail account hosted by Google, file space and distributed printing services. Google also provides students with Google Apps and over 7GB of storage. For more information, visit [oithelp.nd.edu/applications-and-operating-systems/google-at-nd](http://oithelp.nd.edu/applications-and-operating-systems/google-at-nd).

The Notre Dame Computer Store has a variety of computers, printers, software, and other peripheral devices available for students to purchase at substantial savings. Adobe Creative Suite and Microsoft Office are examples of software currently available for considerably less than the retail price. Students can shop online for discounted hardware and software at [oit.nd.edu/sales-service/personal-use-purchase/](http://oit.nd.edu/sales-service/personal-use-purchase/) or visit the Computer Store located at 103 IT Center. Students planning to purchase a computer should consult OIT recommended computer configurations at <http://oit.nd.edu/sales-service/recommended-hardware/> or call (574) 631-7477 for assistance.

There is a 100Mbps ethernet jack for every student living in undergraduate residence halls and graduate student residences. Network-ready devices can be connected directly to the campus computer network. Students with wireless-capable computers also can connect to the campus WiFi network present in all University residence halls and campus buildings. For more information, visit: [oithelp.nd.edu/networking/](http://oithelp.nd.edu/networking/).

All residence hall rooms have standard cable television service with a 70-channel line-up. Additional digital cable television services, including HD, DVR and OnDemand, can be ordered directly from Comcast for an additional fee. For additional information, visit: [oithelp.nd.edu/phone-and-tv/cable-tv/](http://oithelp.nd.edu/phone-and-tv/cable-tv/).

A distributed cellular antenna system (DAS) in various campus locations provides enhanced coverage for major cellular telephone providers, including AT&T, Verizon and Sprint. For more information on cellular telephone service, visit: [oithelp.nd.edu/phone-and-tv/cellular-service/](http://oithelp.nd.edu/phone-and-tv/cellular-service/).

Information technology support services are available to students from the OIT Help Desk, located at 128 DeBartolo Hall. Trained support technicians at the Help Desk are available to answer questions and help guide computer users in diagnosing and resolving problems by phone, e-mail, and in person. For more information about the Help Desk, go to: [oithelp.nd.edu/help-desk/](http://oithelp.nd.edu/help-desk/). Help Desk hours are:

### Normal Hours

Monday–Friday: 8:00 a.m.–5:00 p.m.  
 (Closed Wednesday: Noon–1:30 p.m. for staff meeting)

*The Help Desk remains open on Labor Day when classes are in session.*

**Extended Hours** (available during the academic year when classes are in session)

Phone support only  
 Sunday: 3:00 p.m.–8:00 p.m.  
 Monday–Thursday: 5:00 p.m.–8:00 p.m.

Free computer training classes are available through the OIT to students on a wide range of software. For more information on training programs, go to: [oit.nd.edu/training-classes/](http://oit.nd.edu/training-classes/).

There are five public-access computer labs campus-wide supported by the OIT. Students, faculty, and staff have access these labs that include approximately 260 computers running Windows Vista and Mac OS-X operating systems.

The OIT works closely with the Office of the Registrar and Academic Space Management to design, build, and support technology-enhanced learning spaces on campus. Eighty percent of the Registrar’s classrooms are equipped with audiovisual systems that allow students and faculty to present information from a variety of sources. Small, portable devices such as cameras, audio recording devices, and microphones can be loaned out for class-related use from the OIT facility at 115 DeBartolo Hall. Students and faculty can also take advantage of other OIT services, including videoconferencing, video streaming, video and audio production, and postproduction services, including media duplication.

In addition to mainstream computing services, the OIT, in partnership with the Office of Research, works with the Center for Research Computing 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. For more information, visit [crc.nd.edu](http://crc.nd.edu).

Anyone using Notre Dame computers and network resources must abide by the policies set forth in the document “Responsible Use of Information Technology Resources.” The full text of this policy is available online at: [policy.nd.edu/policy\\_files/ResponsibleUseITResourcesPolicy.pdf](http://policy.nd.edu/policy_files/ResponsibleUseITResourcesPolicy.pdf).

For complete information about OIT services and how to obtain them, please visit [oit.nd.edu](http://oit.nd.edu).

HOLY CROSS SEMINARY FORMATION

## The Career Center

The Career Center is dedicated to the development and implementation of innovative programs and services that promote lifelong career management skills for students and alumni. By cultivating multi-faceted partnerships/networks, our staff is committed to providing the resources for students to explore diverse career opportunities. Staff members assist undergraduate and graduate students as well as alumni with career counseling, career assessment, group workshops, presentations for academic departments, career fairs, and mock interviews, in addition to other services.

We encourage students to take ownership of their career direction, and be willing to devote the time and energy necessary to conduct a successful search for jobs, internships, fellowships, and/or the identification of graduate school programs. Students have the opportunity to utilize our online databases to pursue postgraduate opportunities, sign up for interviews, and conduct career-related research.

### Workshops, Programs, and Special Seminars.

The Career Center collaborates with the College of Arts and Letters, Mendoza College of Business, College of Engineering, College of Science, the School of Architecture, and the Graduate School to coordinate a wide variety of career programs, services, seminars, and workshops for students throughout the year. A sample list includes:

- On-campus career fairs including the Fall Career Expo, Engineering Industry Day, the Winter Career and Internship Fair and Diversity Reception, and the School of Architecture Career Fair
- Off-campus career fairs and consortia events in New York City; Washington, D.C.; Boston; and California
- Fall Kick-Off for seniors
- A variety of workshops dedicated to resumé and cover letter writing techniques, job and internship search strategies, interview skill development, as well as a number of informative programs geared toward students interested in careers in specific industries including nonprofit, investment banking, the federal government, and media.
- Mock Interview Program
- Global Internship Initiative—internship funding programs
- Notre Dame Alumni Job Shadow Program
- Four career courses for academic course credit
- Access to the Strong Interest Inventory, Myers Briggs Type Indicator and Harrison self-assessment instruments (meeting with a career counselor is a prerequisite)
- Networking with Notre Dame alumni workshops
- Externship programs
- Curriculum Vitea (CV) services

**Internships and Summer Jobs.** The Career Center spends a great deal of time with first year, sophomore, and junior students identifying and applying for internships and summer jobs. Students have access to numerous internship databases containing more than 10,000 employment opportunities.

For additional information, contact:

The Career Center  
248 Flanner Hall  
574-631-5200  
[careercenter.nd.edu](mailto:careercenter.nd.edu)

Hours:

- Monday through Friday, 8:00 a.m.–5:00 p.m.
- Walk-in hours in 248 Flanner: Monday through Friday, 1:00–4:45 p.m.

### The Career Center Counseling Staff:

Lee J. Svete, Director

Rose Kopec, Associate Director  
(Early Career Outreach)  
[Rosemary.Kopec.3@nd.edu](mailto:Rosemary.Kopec.3@nd.edu)

Anita Rees, Associate Director  
(College of Arts and Letters)  
[Anita.M.Rees.4@nd.edu](mailto:Anita.M.Rees.4@nd.edu)

Kevin Monahan, Associate Director  
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## Holy Cross Seminary Formation

The Old College undergraduate seminary program is housed in the original campus structure built in 1843 by Notre Dame's founder, Rev. Edward Sorin, C.S.C. It welcomes high school graduates with a serious interest in exploring a vocation as a priest or brother in the Congregation of Holy Cross. With nearly 50 men in formation at Notre Dame, Holy Cross is a growing, international religious community with 1,200 priests, brothers, and seminarians in 15 countries throughout the world.

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

Moreau Seminary, also located on the Notre Dame campus, is the primary formation house for the Congregation of Holy Cross in the United States. The one-year Candidate Program is a pre-novitiate year designed for those with a bachelor's degree in any field who are prepared to discern a vocation to priesthood or brotherhood within vowed religious life. Candidates typically take nine to 12 hours of philosophy and/or theology credits at the University each semester and have ministry placements supervised by seminary staff. Candidates reside at Moreau Seminary with other priests, brothers, and seminarians. They discern their vocation through spiritual direction and active participation in the community life of Moreau Seminary, which is centered around the daily celebration of the Eucharist and the Liturgy of the Hours. After returning from the novitiate, newly professed seminarians begin their formal academic training in the Master of Divinity program.

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

For additional information, contact:

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# The First Year of Studies

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The First Year of Studies is the college to which all entering first-year students at the University of Notre Dame are admitted. Its curriculum stresses broad engagement with the arts, sciences, and humanities. It has three major goals. The first is to lay the intellectual foundations necessary for the pursuit of advanced academic work in any of the University's undergraduate colleges. The second is to cultivate both a sense of curiosity about the universe and a passion for learning. The third is to infuse students with an appreciation for the intrinsic value of higher education and a sense of their responsibilities as stewards of knowledge created, learned, and applied.

The First Year of Studies views advising as a method of teaching and endeavors to keep student developmental patterns as well as sound teaching strategies in mind throughout the academic year. Advisors assist students as they plan their first year at Notre Dame and assist in the transition into the sophomore year. Advisors are charged with the responsibility of working with students through group advising sessions, individual meetings, and informal mentoring in the acquisition of the skills and disciplines of the mind and heart that will enable them to become rigorous and compassionate intellectuals. A first-year student may request a meeting with a member of his or her advising team, which includes a peer advisor along with a faculty advisor, at any time and for any reason. All first-year students are encouraged to take advantage of this opportunity for personal guidance and assistance.

The academic program for first-year students is determined by the University Academic Council and is constructed around a framework called the First-Year Curriculum. The First-Year Curriculum consists of five courses plus physical education or ROTC each semester. These courses are arranged to provide two of the most important features of an academic program for first-year students: (1) a foundation in liberal education and (2) an opportunity to sample areas before declaring a college. Because of the specific requirements within the First-Year Curriculum,

students gain a broad overview of academic areas.

The options and electives found within the curriculum provide the students the opportunity to explore areas of academic interest open to them. Upon successful completion of the First-Year Curriculum, Notre Dame students advance from the First Year of Studies to one of the other undergraduate colleges: the College of Arts and Letters, the Mendoza College of Business, the College of Engineering, the College of Science, or the School of Architecture.

## First-Year Curriculum

The First-Year Curriculum consists of five courses plus physical education or ROTC each semester. Many of these courses satisfy University requirements as well as requirements in the student's intended major.

Descriptions and general recommendations concerning each of the courses in the First-Year Curriculum are given in the following pages. In addition, complete instructions for making course selections and detailed course descriptions are included in the *First Year of Studies Academic Guide*, which is available on the First Year of Studies website and is mailed to all incoming students in June.

Entering students are expected to take the First-Year Curriculum of five courses per semester, along with the laboratories and tutorials that may accompany those courses, plus physical education or ROTC. The applicability of advanced placement credit earned before entering the University is determined by the University department involved. First-year advisors are available to discuss the possibility of waiving advanced credit in order to take the equivalent University course instead. Additional one-credit courses, such as Contemplation and the First Year Experience, choir, band, or social concerns seminars may also be added to the schedule each semester. The various colleges have restrictions on how many one-credit voluntary courses may be applied to the total number of credits required for graduation from the colleges.

The first-year requirements are designed to ensure that all Notre Dame students begin their college career by learning the analytic, mathematic, and communication skills necessary for further work in their areas of greatest interest as well as to provide a foundation to a broad liberal education. Students are encouraged to select courses that will prepare them for advanced study in their present area of interest as well as to choose elective courses that help them explore subjects they have not had an opportunity to study in high school and/or those that will deepen their knowledge in disciplines with which they are already familiar.

## First-Year Requirements

All students must complete the following in their first year:

- 1 semester of University Seminar
- 1 semester of Writing and Rhetoric
- 2 semesters of mathematics
- 2 semesters of science or language\*
- 2 courses in physical education or ROTC
- Elective courses may be used to sample areas of study or to further general education.

*\*The science requirement must be completed by the end of the sophomore year. Foreign language is not a University requirement, but it is required in the College of Arts and Letters, the College of Science, and the School of Architecture.*

## University Requirements

To be eligible for an undergraduate degree, you must complete a minimum of 50% of the degree credit hours at the University (not less than 60 credit hours) and a minimum of 75% of the degree credit hours (not less than 90 credit hours) must be earned after high school graduation through college and university courses. In addition to first-year requirements, all Notre Dame graduates must complete the following courses before graduation:

- 1 course in history\*
- 1 course in social science\*
- 2 courses in philosophy\*
- 2 courses in theology\*
- 1 course in fine arts\* or literature\*
- College and major course requirements

*\*A University Seminar will fulfill one University requirement in one of these disciplines.*

*Only courses marked as "Univ. Req." via the online Class Search can be used to fulfill a University requirement.*

## Course 1—University Seminar/Writing & Rhetoric

University Seminar and Writing and Rhetoric are University requirements. Both courses must be taken during the first year, one in each semester.

University Seminars are designed to foster interaction between first-year students and faculty in small settings. Currently, these courses are offered by departments within the College of Arts and Letters and will satisfy the relevant University requirement in history, literature, fine arts, social science, or

## UNIVERSITY REQUIREMENTS

the first course of the philosophy or theology requirement. These seminars include a significant writing component and require a minimum of 24 pages with at least one rewrite of a corrected paper. Every first-year student is required to complete one University Seminar.

**UNIVERSITY SEMINAR CATEGORIES:**

Fine Arts	13182: Seminars offered by the departments of Art History; Film, Theater, and Television; and Music
History	13184: Seminars offered by the Department of History
Literature	13186: Seminars offered by the departments of American Studies, Arabic, Classics, East Asian Languages and Cultures, English, German and Russian Languages, Irish Language and Literature, Romance Languages, and the Program of Liberal Studies
Philosophy	13185: Seminars offered by the Department of Philosophy
Social Sciences	13181: Seminars offered by the departments of Anthropology, Economics, Political Science, Psychology, and Sociology
Theology	13183: Seminars offered by the Department of Theology

Writing and Rhetoric courses are designed to help students learn how to identify an issue amid conflicting points of view and craft arguments based on various sources of information. The courses stress the identification and analysis of potential counter arguments and aim to develop skills for writing a research proposal, for conducting original research, and for using print and electronic resources from the library. In addition to traditional Writing and Rhetoric courses, community-based and multimedia courses are also offered.

**WRITING AND RHETORIC COURSES:**

WR 12100: Writing and Rhetoric Tutorial  
WR 13100: Writing and Rhetoric  
WR 13200: Community Based Writing & Rhetoric  
WR 13300: Multimedia Writing & Rhetoric

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on

**“Class Search” and selecting the subject *Writing and Rhetoric*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

**Course 2—Mathematics**

All Notre Dame first-year students must take two semesters of mathematics as a University requirement. Students who have credit for the first level of calculus (MATH 10250, 10350, or 10550) must fulfill the University requirement by taking a second level of calculus (MATH 10260, 10270, 10360, or 10560) or a non-calculus mathematics course.

Students in the College of Arts and Letters may fulfill their mathematics requirement by taking any two courses in mathematics. They may be calculus courses, non-calculus-based courses, or one of each. However, students may not take two beginning-level calculus courses to fulfill this requirement.

The mathematics requirement for students planning to enter the Mendoza College of Business includes one calculus course (any level except MATH 10240) and ACMS 10145: Statistics for Business and Economics I.

Students in the School of Architecture take MATH 10250 and 10270. Also acceptable are the calculus sequences required of students in the College of Engineering or the College of Science.

Students majoring in the College of Science will fulfill their University mathematics requirement through one of the following calculus sequences: MATH 10350–10360, MATH 10550–10560, MATH 10850–10860, or MATH 10450–10460. The MATH 10350–10360 and MATH 10450–10460 sequences are designed for students in programs emphasizing the life sciences, such as biological sciences and the preprofessional (premedical and other health-related) programs in either the College of Science or the College of Arts and Letters. Students planning to enter other science programs that require only two semesters of calculus also may use MATH 10350–10360 to satisfy the requirement, but they should be aware that it is not a suitable prerequisite for the upper-level courses MATH 20550 or 20580. Students planning to major in biochemistry or physics must take MATH 10550–10560.

For students in the College of Engineering, the first-year mathematics requirement is fulfilled through the calculus sequence MATH 10550–10560 or MATH 10850–10860.

The MATH 10850–10860 sequence stresses concepts and proofs. It is a more rigorous course than MATH 10550–10560 and is designed especially for students who plan to study mathematics through either the College of Science mathematics major or the College of Arts and Letters honors mathematics major. It is also open to other students with very strong high school mathematics backgrounds.

A student who completes the MATH 10250–10260 or 10250–10270 calculus sequences and then decides to enter a science or an engineering program will have to take additional courses in mathematics, as prescribed by the administrator of the program.

**MATHEMATICS COURSES:**

MATH 10110: Principles of Finite Mathematics  
MATH 10120: Finite Mathematics  
MATH 10130: Beginning Logic  
ACMS 10140: Elements of Statistics  
ACMS 10141: Statistical Reasoning in Politics  
ACMS 10145: Statistics for Business and Economics I  
ACMS 10150: Elements of Statistics II  
MATH 10240: Principles of Calculus  
MATH 10250: Elements of Calculus  
MATH 10260: Elements of Calculus II for Business  
MATH 10270: Elementary Calculus in Action  
MATH 10350: Calculus A  
MATH 10360: Calculus B  
MATH 10550: Calculus I  
MATH 10560: Calculus II  
MATH 10850: Honors Calculus I  
MATH 10860: Honors Calculus II  
MATH 20550: Calculus III

**COURSE DESCRIPTIONS**

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

**Course 3—Science**

First-year students take two semesters of a science as part of the First-Year Curriculum. The courses offered by the College of Science for first-year students are broadly grouped into two main categories, laboratory sciences and topical sciences. The laboratory sciences are intended for students who are planning to major in one of the sciences or in engineering or perhaps would prefer an in-depth discussion of a particular field of study with laboratory work. The second category, topical sciences, is designed for those first-year students who are planning to enter the College of Arts and Letters, the Mendoza College of Business, or the School of Architecture. These courses are rigorous and intellectually demanding and differ from the laboratory sciences chiefly in that they are often somewhat interdisciplinary in nature and/or that they focus on themes that may have an ethical or value-related dimension, and normally they do not include an associated laboratory requirement.

In determining which course to take as Course 3, students should consider the following:



## UNIVERSITY REQUIREMENTS

1. All Notre Dame students must, as a University requirement, take two semesters of science before completion of their sophomore year. However, it is recommended that the science requirement be met in the first year. Students contemplating any of the College of Engineering or College of Science programs or pre-health studies in the College of Arts and Letters must take the science requirement in their first year.

2. Students planning to participate in an international study program during their sophomore year must complete the science requirement in the first year, along with the required language for international study in France or Austria (see Course 5).

3. The science course is often a prerequisite for other courses in these programs. Students planning to enter the College of Arts and Letters Pre-Health Program will also take CHEM 10171 and 10172 in their first year. Students thinking of entering any of the following programs in the College of Science are advised to take CHEM 10171 and 10172 as their science requirement in the first year: environmental sciences, science preprofessional, science collegiate sequences, biological sciences, mathematics, applied mathematics, statistics, and physics. Mathematics and physics majors who do not have an interest in the health care professions may elect to take CHEM 10171 followed by 10122. Chemistry and biochemistry majors take CHEM 10181 and 10182. A second science course is required and discussed under Course 5 for students interested in chemistry, biochemistry, biological sciences, environmental sciences, mathematics, and physics.

4. Students planning on an engineering program are required to take CHEM 10171 and 10122 as the sequence to satisfy the requirement. The CHEM 10171/10172 or 10181/10182 sequences also satisfy the chemistry requirement for engineering students.

5. Prospective arts and letters or business students interested in the environmental sciences second major offered by the College of Science should take CHEM 10171 and 10172 as their science requirement.

6. Students planning on entering the Mendoza College of Business programs or the College of Arts and Letters programs, other than mathematics or pre-health studies, may select freely from among any of the science courses offered and for which they are prepared. However, the following courses are specifically designed for the students planning to enter these programs: BIOS 10101 through 10119; CHEM 10101 through 10104; PHYS 10052, 10062, 10111, 10122, 10140, 10240, 20051, 20061.

7. Students intending to enter the School of Architecture should take PHYS 10111 first semester; PHYS 10310 is also acceptable.

8. First-year students may substitute two semesters of a foreign language in place of two semesters of science to complete their first-year course requirements.

They may also substitute one semester of each, but should keep in mind that the science requirement needs to be completed by the end of the sophomore year.

**LABORATORY SCIENCE COURSES:**

BIOS 10161: Biological Sciences I  
 BIOS 10162: Biological Sciences II  
 CHEM 10171: General Chemistry:  
 Introduction to Chemical Principles  
 CHEM 10172: General Chemistry: Organic  
 Structure and Reactivity  
 CHEM 10122: General Chemistry: Biological  
 Processes  
 CHEM 10181: Introduction to Chemical  
 Principles  
 CHEM 10182: Organic Structure and  
 Mechanism  
 PHYS 10310: General Physics I  
 PHYS 10320: General Physics II  
 PHYS 10411: General Physics A-M  
 Mechanics  
 PHYS 10424: General Physics B-M Waves/  
 Thermo

**TOPICAL SCIENCES COURSES:**

BIOS 10101: Human Genetics, Evolution,  
 and Society  
 BIOS 10106: Common Human Diseases  
 BIOS 10107: Ecology and Evolution  
 BIOS 10108: Revolutions in Biology  
 BIOS 10114: Avian Biology  
 BIOS 10115: Microbes and Man  
 BIOS 10119: Evolution and Society  
 CHEM 10101: Foundations of Chemistry  
 CHEM 10102: Chemistry, Environment, and  
 Energy  
 CHEM 10103: Chemistry and Crime  
 CHEM 10104: Forensic Chemistry  
 PHYS 10052: Concepts of Energy and  
 Environment  
 PHYS 10062: Science Literacy  
 PHYS 10111: Principles of Physics I  
 PHYS 10122: Principles of Physics II  
 PHYS 10140: Descriptive Astronomy  
 PHYS 10240: Elementary Cosmology  
 PHYS 10262: Physical Methods in Art and  
 Archaeology  
 PHYS 20051: Energy and Society  
 PHYS 20061: Nuclear Warfare

**COURSE DESCRIPTIONS**

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject Science (Non-departmental). Course descriptions can be found by clicking on the subject code and course number in the search results.**

## Course 4—University Requirement or Elective: History, Social Sciences, Philosophy, Theology, Literature, Fine Arts, and Languages

Elective courses are typically selected with the idea of exploring academic interests or to satisfy University or intended college program requirements. Every Notre Dame first-year student must take at least one semester of fine arts, history, literature, philosophy, social science, or theology during their first year.

Specific recommendations for electives are made for three of the intended college programs. The College of Engineering recommends that first-year students planning on majoring in engineering take PHYS 10310 in the spring semester as their Course 4 elective. Students intending to study architecture are advised to take ARCH 11011 as their Course 4 elective in the fall semester. They will then take ARCH 11021 and ARCH 10311 in the spring semester. Students intending to study business are advised to take microeconomics, ECON 10010/10011, in either the fall or spring semester.

**A SAMPLING OF UNIVERSITY REQUIREMENT AND ELECTIVE COURSES****HISTORY:**

HIST 10085: History of the Modern Middle East  
 HIST 10106: Modern South Asia  
 HIST 10200: Western Civilization I  
 HIST 10210: Ancient Greece and Rome  
 HIST 10400: Western Civilization II  
 HIST 10600: U.S. History I: From Colonial America to 1877  
 HIST 10605: U.S. History II: From Reconstruction to the Present  
 HIST 10900: Latin American History Through Film  
 HIST 10901: Colonial Latin America  
 HIST 10990: Environment and Civilization  
 HIST 20110: Ancient Japan  
 CLAS 20105: History of Ancient Greece  
 CLAS 20205: History of Ancient Rome

**SOCIAL SCIENCES:**

ANTH 10109: Introduction to Anthropology  
 ANTH 20105: Introduction to Human Ethology  
 ANTH 20360: Societies and Cultures of Latin America  
 ANTH 20380: Anthropology of Gender  
 ANTH 20520: Archeology of Egypt  
 ECON 10010/10011: Principles of Microeconomics  
 ECON 10020: Principles of Macroeconomics  
 GSC 10001/20001: Introduction to Gender Studies  
 POLS 10100: American Politics  
 POLS 10200: International Relations  
 POLS 10400: Comparative Politics  
 PSY 10000: Introductory Psychology  
 SOC 10002: Understanding Societies  
 SOC 10033: Introduction to Social Problems

## UNIVERSITY REQUIREMENTS

SOC 10722: Introduction to Social Psychology

**PHILOSOPHY:**

PHIL 10100/10101: Introduction to Philosophy

**THEOLOGY:**

THEO 10001: Foundations of Theology:  
Biblical/Historical

**LITERATURE:**

CLAS 10200: Greek and Roman Mythology  
ENGL 20513: Introduction to Irish Writers  
IRLL 20120: The Irish Short Story  
MELC 10101: Introduction to Arabic Culture  
and Civilization

**FINE ARTS:**

ARHI 20362: European Art of the Seventh-  
Eighteenth Centuries  
ARHI 20441: Introduction to Twentieth  
Century Art  
ARST 11100: 2-D Foundations  
ARST 11201: Drawing I  
ARST 11301: Painting I  
ARST 11601: 3-D Foundations  
ARST 21101: Ceramics I  
ARST 21401: Photography I  
ARST 21501: Silkscreen  
ARST 21505: Artists' Books and  
Papermaking  
FTT 10101: Basics of Film and Television  
FTT 10701: Introduction to Theater  
FTT 10910: Science Play  
FYS 10610: Topics in the Arts at Notre Dame  
MUS 10131: Introduction to Jazz  
MUS 10150: Music of the Catholic Rite  
MUS 10161: The Soundtrack of History  
MUS 10912: Famous First Performances  
MUS 20001: Theory I  
MUS 20002: Theory II  
MUS 20111: Introduction to 18th-Century  
Music  
MUS 20145: Understanding World Music

**ELECTIVE FOR SUPPLEMENTARY MAJOR  
OR MINOR:**

GSC 10001: Introduction to Gender Studies

**LANGUAGES:**

CLGR 10001: Beginning Greek I  
CLGR 10002: Beginning Greek II  
CLGR 20003: Intermediate Greek  
CLLA 10001: Beginning Latin I  
CLLA 10002: Beginning Latin II  
CLLA 20003: Intermediate Latin  
CLLA 20004: Intermediate Latin II  
EALC 10111: Intensive First-Year Chinese I  
EALC 10112: Intensive First-Year Chinese II  
EALC 20211: Second-Year Chinese I  
EALC 20212: Second-Year Chinese II  
EALJ 10111: Intensive First-Year Japanese I  
EALJ 10112: Intensive First-Year Japanese II  
EALJ 20211: Second-Year Japanese I  
EALJ 20212: Second-Year Japanese II  
EALK 10111: Intensive First-Year Korean I  
EALK 10112: Intensive First-Year Korean II  
EALK 20211: Second-Year Korean I  
EALK 20212: Second-Year Korean II  
EALK 40421: Advanced Korean I  
EALK 40422: Advanced Korean II  
GE 10101: Beginning German I  
GE 10102: Beginning German II  
GE 10111: Intensive Beginning German I  
GE 10112: Intensive Beginning German II  
GE 20201: Intermediate German I  
GE 20202: Intermediate German II

IRLL 10101: Beginning Irish I  
IRLL 10102: Beginning Irish II  
IRLL 20103: Intermediate Irish  
LLRO 10101: Beginning Quechua I  
MEAR 10001: Intensive First-Year Arabic I  
MEAR 10002: Intensive First-Year Arabic II  
MEHE 10001: Elementary Hebrew  
ROFR 10101: Beginning French I  
ROFR 10102: Beginning French II  
ROFR 10115: Intensive Beginning French  
ROFR 20201: Intermediate French I  
ROFR 20202: Intermediate French II  
ROFR 20215: Intensive Intermediate French  
ROFR 20300: Conversational French  
ROFR 27500: Approaches to French and  
Francophone Cultures  
ROFR 30310: Analyze This!  
ROFR 30320: Advanced Grammar and  
Composition  
ROIT 10101: Beginning Italian I  
ROIT 10102: Beginning Italian II  
ROIT 10115: Intensive Beginning Italian  
ROIT 20201: Intermediate Italian I  
ROIT 27500: Intermediate Italian II  
ROIT 20215: Intensive Intermediate Italian  
ROIT 30310: Passage to Italy  
ROPO: 10103: Brazilian Portuguese  
Language and Culture I  
ROPO: 10104: Brazilian Portuguese  
Language and Culture II  
ROPO: 10105: Portuguese for Spanish  
Speakers I  
ROPO: 10106: Portuguese for Spanish  
Speakers II  
ROPO 10115: Intensive Beginning  
Portuguese  
ROPO: 20201: Intermediate Portuguese I  
ROPO: 20202: Intermediate Portuguese II  
ROPO: 20300: Advanced Oral Expression  
ROSP: 10101: Beginning Spanish I  
ROSP: 10102: Beginning Spanish II  
ROSP: 10115: Intensive Beginning Spanish  
ROSP: 20201: Intermediate Spanish I  
ROSP: 20202: Intermediate Spanish II  
ROSP 20237: Conversation and Writing  
ROSP 27500: Approaches to Hispanic  
Cultures Through Writing  
ROSP 30310: Textual Analysis  
RU 10101: Beginning Russian I  
RU 10102: Beginning Russian II  
RU 20101: Intermediate Russian I  
RU 20102: Intermediate Russian II

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- *History*
- *Social Sciences*
- *Philosophy*
- *Theology*
- *Literature*
- *Fine Arts*
- *Languages*

Course descriptions can be found by clicking on the subject code and course number in the search results.

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**Course 5—Program Requirement or Elective**

Any of the courses listed under Course 4 may be taken as a Course 5 elective, unless the student's intended major requires him or her to take a particular course instead. These required courses will be discussed below. Most students should use this elective to explore areas of academic interest, and many students may want to consider continuing in or beginning foreign language study.

Language is required by the College of Arts and Letters and the College of Science. The languages available include Arabic, Chinese, French, German, Greek, Irish, Italian, Japanese, Korean, Latin, Portuguese, Quechua, Russian, and Spanish. Students with previous background in a language who want to continue their language study must take a placement exam to determine proper placement. However, students with no previous background in a language can elect a beginning-level course. See the Credit and/or Placement by Examination section below for more information on placement in a language course. Regardless of their scores on the credit or placement examinations, students in the College of Arts and Letters must take at least one language course in residence at Notre Dame. In the College of Science, students who place higher than the intermediate level (third semester) are considered to have fulfilled the language requirement and need not take any additional courses in the language. Students contemplating an international study program that requires language study should consult with the language department regarding the appropriate language preparation. All students are encouraged to start their study of language during their first year or the beginning of their second year at the latest.

First-year students who plan to participate in an International Study Program during their sophomore year must complete both their science and foreign language requirements during their first year. There is no opportunity to take a science course abroad, and the requirement must be satisfied by the end of the sophomore year.

Students intending to major in the College of Science's biology, biochemistry, chemistry, environmental science, mathematics, or physics program will take more than one science each semester and need to use Course 5 to take the second science. The second science course sequence for the chemistry and mathematics programs is PHYS 10310–10320; for the environmental science, biochemistry, and biology programs, it is BIOS 10161–10162; and for the physics program, it is PHYS 10411–10424.

Students intending to major in studio art should take DESN 11100 and ARST 11201 as their fifth course, and students intending to major in Music should take MUS 20001 and 20002 plus a one-credit lesson course each semester.

Students intending to major in architecture are expected to take ARCH 11021 and 10311.

## UNIVERSITY REQUIREMENTS

College of Engineering intents should enroll in EG 10111–10112 as their fifth course.

See the various college and department summaries in this Bulletin for details on the requirements for all of these programs.

### PROGRAM REQUIREMENT COURSES NOT PREVIOUSLY LISTED:

ARCH 10311: Analysis of Architectural Writing  
 ARCH 11011: Graphics I-Drawing  
 ARCH 11021: Graphics II-Drafting  
 EG 10111: Introduction to Engineering Systems I  
 EG 10112: Introduction to Engineering Systems II

### COURSE DESCRIPTIONS

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

## Physical Education or Reserve Officers Training Corps Program

All Notre Dame first-year students must take two semesters of physical education as a University requirement. However, first-year students who enroll and remain in an ROTC program are exempted from physical education.

Specific physical education units are chosen after arriving on campus. For more information about the physical education courses offered, refer to the course descriptions under the Physical Education section of this Bulletin.

### RESERVE OFFICERS TRAINING CORPS PROGRAM (ROTC) COURSES:

AS 10101: Foundations of the U.S. Air Force  
 AS 10102: Foundations of the U.S. Air Force  
 MSL 10101: Foundations of Officership  
 MSL 10102: Basic Military Leadership  
 NSCI 10101: Introduction to Naval Science  
 NSCI 10102: Maritime Affairs

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Physical Education*
- *Reserve Officers Training Corps Program*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## Voluntary Courses

In addition to five academic courses and PE or ROTC, voluntary one- and two-credit courses are offered in the areas of the fine arts, history, music, dance, business, study skills, and theology. These courses may not be substituted for any of the six required courses. The colleges have restrictions on the number of one or two-credit courses that will be applied to the total number of credits required for graduation from the colleges.

### VOLUNTARY COURSES:

BAUG 30209: Boardroom Insights  
 BAUG 30210: Ten Years Hence Lecture Series  
 FYS 10107: Contemplation and the First Year Experience  
 FYS 10109: Film and the Analysis of Choice  
 FYS 10402: Law School 101  
 FYS 10405: Giving Back through Education  
 FYS 10407: Introduction to Cultural Competency  
 MUS 10201: Brass Ensemble  
 MUS 10203: Chamber Ensemble  
 MUS 10210: Chorale  
 MUS 10221: Glee Club  
 MUS 10222: Collegium Musicum  
 MUS 10230: Jazz Band  
 MUS 10241: Wind Ensemble  
 MUS 10244: Concert Band  
 MUS 10245: University Band  
 MUS 10247: Concert Winds  
 MUS 10249: Marching Band  
 MUS 10250: Symphony Orchestra  
 MUS 10251: Chamber Orchestra  
 MUS 10300- MUS 11340: Voice and Instrumental Lessons  
 THEO 33950: Social Concerns Seminar: Appalachia  
 THEO 33963: Social Concerns Seminar: The Church and Social Action—Urban Plunge  
 THEO 33936: Summer Service Learning: Confronting Social Issues

### COURSE DESCRIPTIONS

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

## Credit and/or Placement by Examination

The First Year of Studies processes advanced credit. However, it is the other University departments and colleges in coordination with First Year of Studies, who determine exactly what advanced credit will be awarded. In some cases, students will be required to take their science courses at the University, even if they have advanced credit for those courses. This is especially true for students who may wish to pursue a degree in one of the preprofessional (pre-medical and related health professions) majors. First Year of Studies advisors are available to discuss these issues with students both in the summer and during the academic year.

Entering first-year students may become eligible for credit by examination in four ways: (1) through the Advanced Placement Program administered by the College Entrance Examination Board, (2) through the SAT II-Subject Tests in French, German, Italian, and Spanish, (3) through the International Baccalaureate Program administered by International Baccalaureate North America, (4) through the Notre Dame Mathematics Credit Examination Program. Students' placement may be determined through the online Notre Dame French, German, and Spanish placement examinations, but no credit is awarded. Placement examinations for Arabic, Chinese, Japanese, Korean, and Russian are also administered on campus.

1. *Advanced Placement Program (AP)*—Students who submit results of Advanced Placement examinations are eligible to receive placement and credit in accordance with the accompanying table.
2. *SAT-II Subject Tests (SAT II)*—Results of CEEB Advanced Placement Examinations or the SAT-II Subject Tests in French, German, Italian, or Spanish are used for course placement and credit by examination purposes in accordance with the accompanying table.
3. *International Baccalaureate Program (IB)*—Students who submit results of International Baccalaureate Higher Level examinations are eligible to receive placement and credit in accordance with the accompanying table. The University does not give credit for Subsidiary Level examinations.
4. *Notre Dame Mathematics Credit Examination Program*—First-year students may take examinations for possible course placement and credit in mathematics after they arrive on campus. The examinations will be based on college-level courses.

### Notre Dame Online French, German, Latin and Spanish Placement Examination Programs—

First-year students may take online examinations for placement only. These examinations are available during the summer as well as during the academic year.

When credit is awarded, the dean of the First Year of Studies has it entered on the student's transcript, which is maintained by the Registrar's office. This

## UNIVERSITY REQUIREMENTS

credit can be applied toward required or elective courses if the student's particular college program permits. If Advanced Placement, International Baccalaureate, or Notre Dame Mathematics Examination credit is not applicable in a specific college program, that credit is recorded on the student's transcript, but it represents credit in excess of graduation requirements. Placement, but not credit, for the Notre Dame online placement examinations is recorded in the student's official records, but not on his or her transcript.

The general guideline is that credit by examination is counted as required or elective credit if the course is required or permitted in a particular college program. Credit by examination is not counted as required or elective credit if the number of the course for which credit is awarded is lower than the initial course required in a particular college program. For example, if a student earns a 4 on the Advanced Placement Physics B test, the six credits awarded for PHYS 10111–10122 would count toward graduation in a College of Arts and Letters, Mendoza College of Business, or School of Architecture program. The credits would not count toward graduation in a College of Engineering program since the initial physics course in this college is PHYS 10310. On the other hand, if the number of the course for which credit is awarded is higher than the initial course required in a particular college program, the credit awarded satisfies that requirement. For example, credit awarded for MATH 10550–10560 also satisfies the mathematics requirement for programs requiring MATH 10350–10360 or MATH 10250–10260.

**Language placement**—Students with no previous background in a language can elect a beginning-level course. Students with previous background in a language who want to continue their language study must take a placement exam to determine proper placement.

Students may use the results from a foreign language credit by examination (AP, SAT II, IB) for placement, as described under the Credit by Examination table. A maximum of six credits can be granted for performance on a foreign language credit by examination. Students should consult with the dean of their college to determine the applicability of this policy for their particular program of studies.

Students who have not taken a language credit by examination before entering Notre Dame, may take one at Notre Dame. All foreign language departments at Notre Dame offer placement exams. The French, German, Latin and Spanish placement exams are available online. Placement exams for other languages are given during the First Year Orientation Weekend in August and at least twice during the school year in time for fall and spring advance registration. Information on language placement is sent to incoming first-year students during the summer. The appropriate department and the First Year of Studies will guide students with

previous instruction in their languages after reviewing their high school background and placement tests.

Regardless of their scores on credit or placement exams, students in the College of Arts and Letters must take at least one language course in residence at Notre Dame. Arts and Letters students must also complete at least one course at the intermediate or higher level that deals with texts in the original language. If placement allows, one course at Notre Dame at the intermediate or higher level may satisfy both parts of this requirement. In the College of Science, students who place higher than the intermediate level (third semester) are considered to have fulfilled the language requirement and need not take any additional courses in the language. Students contemplating an international study program that requires language study should consult with the language department regarding appropriate language preparation. All students are encouraged to start their study of language during their first year or the beginning of their second year at the latest.

## College Credit from Other Institutions

The University's other colleges and departments, in consultation with the First Year of Studies, determine whether or not college courses completed after the junior year and prior to first-year enrollment and taken at other institutions will be accepted for credit. In order to be considered for credit, these courses must have been completed on college campuses and must not have been used to satisfy high school graduation requirements or Notre Dame requirements for first-year admission. An official transcript, a course syllabus, and a copy of the published description of the course are also necessary for consideration of the course for credit. Normally, courses specified in the First-Year Curriculum may not be satisfied through transfer credit. First-year students need to resolve all college credit situations before or during their first semester at Notre Dame.

### THE ADVANCED PLACEMENT EXAMINATIONS

AP Examination	AP Grade Required	No. of Credits Awarded	Notre Dame Course Typically Credited
American History	5	3	HIST 10010
Biology	5	8	BIOS 10098 and 10099
Biology	4	3	BIOS 10101
Calculus AB	5	4	MATH 10550
Calculus BC	5	8	MATH 10550 and 10560
Calculus BC (AB Subscore)	5	4	MATH 10550
Chemistry	5	4	CHEM 10171
Chemistry	4	3	CHEM 10101
Economics (Microeconomics)	5	3	ECON 10010
Economics (Macroeconomics)	5	3	ECON 10020
English (either exam)	4	3	WR 13100
European History	5	3	HIST 10020
Political Science (American Politics)	5	3	POLS 10100
Political Science (Comparative)	5	3	POLS 10400
Latin	4	8	CLLA 10001 and 10002
Latin	3	4	CLLA 10001
Physics B	5	8	PHYS 10095 and 10096
Physics B	4	3	PHYS 10091
Physics C (Mechanics)	5	4	PHYS 10093
Physics C (Mechanics)	4	3	PHYS 10091
Physics C (Electricity and Magnetism)	5	4	PHYS 10094
Physics C (Electricity and Magnetism)	4	3	PHYS 10092
Psychology	5	3	PSY 10000
Statistics	5	3	ACMS 10145
World History	5	3	HIST 10030

## UNIVERSITY REQUIREMENTS

## Peer Advising Program

The Peer Advising Program in the First Year of Studies at the University of Notre Dame provides the opportunity for first-year students to engage in meaningful conversation with reliable and informed upper-class students. These interactions focus on the general adjustment of the first-year student to the university setting. Peer Advising endeavors to welcome all students to the Notre Dame community by reassuring and encouraging students as they begin university-level study; informing students about a variety of campus resources; emphasizing the mission and initiatives of the First Year of Studies; and listening for the challenges and concerns of new students

## Learning Resource Center

In addition to individual and group advising, and peer advising, the First Year of Studies offers first-year students a large support system to assist them in making a successful transition from high school learning strategies to college-level skills. The Learning Resource Center houses the Learning Strategies Program, the Tutoring Program, and the Collaborative Learning Program. The assistance offered through these programs is supplemental and not meant to replace the student's own efforts, classroom instruction, meetings with the professor, or any other aids offered by the instructor or department. There is no additional charge or fee for any of these programs.

## Learning Strategies Program

All first-year students interested in improving their skills for success in college may participate in small group workshops or schedule individual meetings with the First Year of Studies learning strategies specialist. The Learning Strategies Program covers a variety of topics of practical value to students (e.g., time management, note taking, test preparation) and includes individual assistance with writing and reading for various academic genres.

## Tutoring Program

The First Year of Studies Tutoring Program is available to all first-year students who would like to improve on their understanding of course material. In addition to the traditional tutor-student interaction, the small size and flexible pace of these tutoring sessions encourages peer interaction and provides a conducive setting for students to ask individual questions.

## Collaborative Learning Program

The Collaborative Learning Program is also open to all first-year students. In collaborative learning sessions, students solve homework problems together while focusing on the problem-solving methods. Collaborative learning resource leaders monitor the sessions, encourage problem-solving and collaboration among group members, and answer questions when necessary.

## First-Year Goals

The First Year of Studies, its curriculum, and its support systems are all designed to encourage first-year students to work toward gaining an understanding of how the Arts, Sciences, and Humanities enable one to engage in a serious exploration of the important and complicated questions, the questions that deal with matters pertaining to God, nature, and human institutions. They are designed to help students become acquainted with the disciplines that make up these areas of intellectual inquiry and to begin to engage these questions by selecting challenging classes, attending public lectures, building collaborative relationships with peers, and by seeking opportunities to forge mentoring relationships with faculty.

### SAT II SUBJECT TESTS FOR FRENCH, SPANISH, AND GERMAN

SAT II Subject	Advanced Placement	Credits (Courses)	Placement Level
<b>French and French with Listening</b>			
790—800	5 (lang)/4 (lit)	6 (20201—20202)	30310 or 30320
690—780	4 (lang)/3 (lit)	6 (20201—20202)	20300 or 27500
590—680	3 (lang)/2 (lit)	7 (10102—20201)	20202
490—580	2 (lang)/1 (lit)	8 (10101—10102)	20201 or 20215
480	1 (lang)	4 (10101)	10102 or 10115
<b>Spanish and Spanish with Listening</b>			
800	5 (lang)/4 (lit)	6 (20201—20202)	30310 or 30320
690—790	4 (lang)/3 (lit)	6 (20201—20202)	20237 or 27500
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
<b>German and German with Listening</b>			
790—800	5 (lang)/4 (lit)	7 (10102—20201)	20202 or 30000+
690—780	4 (lang)/3 (lit)	8 (10101—10102)	20201
570—680	3 (lang)/2 (lit)	4 (10101)	10102

### SAT II SUBJECT TESTS FOR ITALIAN

SAT II Subject	Advanced Placement	Credits (Courses)	Placement Level
<b>Italian and Italian with Listening</b>			
790—800	5 (lang)/4 (lit)	6 (20201—20202)	30310
690—780	4 (lang)/3 (lit)	6 (10102—20201)	27500
590—680	3 (lang)/2 (lit)	6 (10101—10102)	20201 or 20215
490—580	2 (lang)/1 (lit)	3 (10101)	10102

## UNIVERSITY REQUIREMENTS

**INTERNATIONAL BACCALAUREATE—NOTRE DAME CREDIT**

International Baccalaureate Subject (Higher Level)	IB Grade Required	No. of Credits Awarded	Notre Dame Course Typically Credited
Biology	6	6	BIOS 10101 and 10107
Biology	7	8	BIOS 10098 and 10099
Chemistry	6	3	CHEM 10101
Chemistry	7	4	CHEM 10171
Economics	6	6	ECON 10010 and 10020
English	6	3	WR 13100
Foreign Languages			
Arabic	6	8	MEAR 10001 and 10002
Chinese	6	5	EALC 10111
French	6	8	ROFR 10101 and 10102
German	6	8	GE 10101 and 10102
Greek	6	8	CLGR 10001 and 10002
Italian	6	6	ROIT 10101 and 10102
Japanese	6	5	EALJ 10111
Latin	6	8	CLLA 10001 and 10002
Russian	6	8	RU 10101 and 10102
Spanish	6	8	ROSP 10101 and 10102
History of the Americas	6	3	HIST 10010
Mathematics	7	8	MATH 10550 and 10560
Physics	6	3	PHYS 10091
Physics	7	8	PHYS 10093 and 10094
Psychology	6	3	PSY 10000
Social and Cultural Anthropology	6	3	ANTH 10109

# School of Architecture

*Francis and Kathleen Rooney Dean of the School of Architecture:*

Michael N. Lykoudis

*Associate Dean:*

John W. Stamper

*Associate Dean for Research, Scholarship & Creative Work:*

Dennis P. Doordan

*Assistant Dean:*

Rev. Richard S. Bullene, C.S.C.

*Graduate Director:*

Phillip H. Bess

*Interim Graduate Director:*

Samantha Salden

*Academic Director Rome Studies Program:*

José Cornelio da Silva

*Professors:*

Philip H. Bess; Dennis P. Doordan; Michael N. Lykoudis; Ingrid D. Rowland; Thomas Gordon Smith; John W. Stamper; Duncan Stroik; Carroll William Westfall; Samir Younés

*Associate Professors:*

Richard Economakis; Gil Gorski; Krupali Krusche; David Mayernik; Steven Semes; Lucien Steil

*Assistant Professors:*

Aimee Buccellato; Kimberly Rollings; Samantha Salden

*Visiting Professors:*

William Ponko; José Cornelio da Silva

*Visiting Associate Professor:*

Jorge Trelles; Luis Trelles

*Concurrent Associate Professor:*

Robin Rhodes

*Visiting Assistant Professors:*

Jennifer Griffin; John Griffin

*Guest Assistant Professors:*

Richard Piccolo; Alessandro Pierattini

*Professors of the Practice:*

Selena Anders; Robert Brandt; Kevin Buccellato; Rev. Richard S. Bullene, C.S.C.; Alan DeFrees; Douglas Duany; Sallie Hood; Ronald Sakal

*Concurrent Professional Specialist:*

Giovanna Lenzi-Sandusky

*Concurrent Assistant Professional Specialist:*

Brian Smith

*Guest Associate Professional Specialist:*

Ettore Mazzola

*Adjunct Professor:*

Frank Huderwitz

*Adjunct Associate Professor:*

Jed Eide

*Adjunct Assistant Professor:*

John Mellor

**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 a three-year program 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 United States, most state 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 U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a 6-year, 3-year, or 2-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 consist of a preprofessional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. 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. (163 undergraduate credits)

M.Arch. (preprofessional degree + 54 graduate credits)

M.Arch. (non-pre-professional degree + 90 credits)

Next accreditation visit for all programs: 2016

In spring of 2010 the School of Architecture completed its most recent NAAB accreditation evaluation and was granted a full 6-year term of accreditation.

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 first professional degree of bachelor of architecture (B.Arch.), the School of Architecture offers three paths of graduate studies leading to one of two degrees. The Path A graduate course of study leads to the two-year post-professional master of architectural design and urbanism degree (MADU), which is intended for people already holding a professional degree in architecture (B.Arch. or M.Arch.). The Path B graduate course of study leads to a two-year master of architecture (M.Arch.) professional degree, and is intended for people holding a four-year undergraduate preprofessional degree with a major in architecture. The Path C graduate course of study leads to a three-year master of architecture (M.Arch.) professional degree, and is intended for people holding undergraduate degrees in fields other than architecture. All three graduate paths of study entail a one-year concentration in either classical architecture or urban design, and conclude with a semester-long independent design project.

Concentrations in furniture design, in historic preservation and restoration, in practice and enterprise, in architectural practice and enterprise, and in building arts are also options within the first professional degree program.

Required courses for the concentration in furniture design are Beginning Furniture; Advanced Furniture Design; Special Studies in Furniture Design; and Special Studies in Furniture Design 2.

The concentration in historic preservation and restoration 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.

## FIRST-YEAR GOALS

In addition to the professional practice course in the B.Arch. curriculum, 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.

The concentration in building arts requires four courses: Introduction to Architectural Models, Advanced Architectural Models and Design, and Construction of Architectural Elements I and II. All four courses consist of group projects.

Concentrations are declared at the end of the third year.

Both the undergraduate and graduate programs at Notre Dame take advantage of the school's proximity to Chicago, where the school has recently acquired studio space in the historic Santa Fe Building owned by the University. In addition, 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 manipulating them in design problems. The sophomore year begins with paradigmatic projects and ends by solving complex and challenging building programs. The sophomore foundation is reinforced in the third year, spent in Rome. There, 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 normal Western focus. The undergraduate program culminates with a thesis design project completed in the fifth year of study.

The Center for Building Communities was begun in 2006. With financial support through a gift from Champion Enterprises, Inc., studios explore the use of contemporary modular wood and steel construction in traditional urbanism.

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.

Facilities. The School of Architecture is located in Bond Hall of Architecture. This building, the former University Library, was thoroughly rebuilt from 1995 through 1996. The 60,000-square-foot building contains classrooms, an auditorium, library, computer lab, and studios that are both functional and designed in accord with the historical limestone structure. The Rome Studies Center is in the heart of Rome's historic center.

#### 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. He established the prizes 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.

#### 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.

<i>Course</i>	<i>First Semester Credits</i>	<i>Second Semester Credits</i>
Writing and Rhetoric/ University Seminar	3	3
MATH 10250 and 10270	3	3
PHYS 10111 and 10222 or PHYS 10111 and Science Elective	3	3
<i>Social Science</i>	3	—
ARCH 11011. Graphics I: Drawing	3	—
ARCH 11021. Graphics II: Drafting	—	3
ARCH 10311. Architectural Writings	—	4
Physical Education	—	—
	15	16

The courses listed below indicate the normal sequence for sophomore, junior, senior, and fifth years majoring in architecture.

#### Sophomore Year

<i>First Semester</i>	
ARCH 21111. Design I	6
ARCH 20411. Building Technology I	3
ARCH 20211. Architectural History I	3
Introduction to Theology	3
Introduction to Philosophy	3
	18

#### Second Semester

ARCH 21121. Design II	6
ARCH 20221. Architectural History II	3
ARCH 20511. Structural Mechanics for Architects	3
ROIT 10110. Beginning Italian	6
	18

#### Junior Year (Rome Studies Program)

##### First Semester

ARCH 34112. Design III	6
ARCH 34312. Architectural History III	3
ARCH 34212. Roman Urbanism and Architecture I	3
ARCH 34012. Advanced Graphics: Freehand Drawing	3
	15

##### Second Semester

ARCH 34122. Design IV	6
ARCH 34322. Architectural History IV	3
ARCH 34222. Roman Urbanism and Architecture II	3
ARCH 34022. Advanced Graphics: Watercolor	3
	15

#### Senior Year

##### First Semester

ARCH 40411. Environmental Systems I	3
ARCH 41111. Design V	6
ARCH 41011. Graphics V: Computers	3
ARCH 40511. Structural Design for Architects	3
<i>Elective</i>	3
	18

##### Second Semester

ARCH 41121. Design VI	6
ARCH 40421. Building Technology II	3
ARCH 40521. Applied Structural Systems	3
<i>Philosophy</i>	3
<i>Elective</i>	3
	18

#### Fifth Year

##### First Semester

ARCH 51111. Design VII	6
ARCH 50419. Environmental Systems II	3
<i>Theology</i>	3
<i>Elective</i>	3
	15

##### Second Semester

ARCH 51121. Design VIII (Thesis)	6
ARCH 50711. Professional Practice	3
<i>History</i>	3
<i>Elective</i>	3
	15

Total for five years: 163 semester hours.



## STUDENT AWARDS AND PRIZES

**COURSE DESCRIPTIONS**

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

## Student Awards and Prizes

*Henry Adams Medal and Certificate.* This American Institute of Architecture (AIA) award honors the graduating architecture student who has the highest grade-point average for the complete course of study.

*Henry Adams Certificate.* This AIA award is given to the graduating architecture student with the second-highest grade-point average for the complete course of study.

*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.

*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.

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

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

*Ferguson and Shamamian Undergraduate Prize.* Selected by the fifth-year thesis jury, the Ferguson & Shamamian Architects Undergraduate Prize is awarded to a fifth-year student for excellence in classical design exhibited in thesis.

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

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

*Rome, Paris, Athens Prize.* Selected by the fifth-year thesis faculty and the dean, this award is for the scope of exploration and the quality of individual

buildings that successfully unite architecture and urban design.

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

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

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

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

*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.

*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 faculty, honors the student whose work in freehand drawing in the third year of study has been of the highest merit.

*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.

*James E. Childs and Associates Scholarship.* Selected by the faculty and the Office of Financial Aid to provide tuition assistance to minority students of particular ability and need.

*David M. Schwarz/Architectural Services, Inc. Internship and Traveling Fellowship Award.* A two-month 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/ Architectural Services, Inc. and a one-month travel fellowship involving independent research and study.

*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.

*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.

*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.

*Ricardo and Cristina Alvarez-Diaz Award in Architecture.* Selected by a committee of students, this award is given to an undergraduate architecture student at the end of their fourth year in the program.

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

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

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

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

*Rambush Prize in Religious Architecture.* Selected by the fifth-year thesis jury and faculty, the Rambush Prize is given for the best solution to a problem related to a religious architecture project.

*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.

*Ferguson & Shamamian Graduate Prize.* Selected by the graduate review jury, the Ferguson & Shamamian Architects Graduate prize is awarded to a graduate student for excellence in classical/traditional design exhibited in a terminal project or graduate thesis.

*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.

*Cristina Villalon Diaz Award for Architectural Excellence in Sustainability.* Selected by the faculty, the Cristina Villalon Diaz Award is given to a graduate student during their terminal year in the program.

*Lochner SCTC Scholarship Award.* The Lochner SCTC Award – is selected by the dean, the graduate program director, and the graduate design faculty, this graduate level scholarship is for educational purposes in connection with the Notre Dame Rome Studies Program. The “SCTC” honors the tradition

## STUDENT ORGANIZATIONS

of Fr. Lochner's compassionate communication: In every letter, postcard, and Christmas mailing (and in many personal discussions) he always ended with his constant reminder, "SCTC," which stood for "Stay Close To Christ."

*Marvin Window and Doors.* Selected by thesis professors and Marvin Windows, for undergraduate and graduate thesis students incorporating Marvin or Integrity products into their projects.

## Student Organizations

### *American Institute of Architecture Students (AIAS).*

Students begin to engage in the professional activities of the national AIAS by attending meetings and conventions and structuring activities within the School of Architecture. The AIAS sponsors educational, professional, and social events in the school.

*Students for New Urbanism (SNU).* SNU is a community of students from all majors that present, explore, discuss, and apply the ideals of New Urbanism and other "good urbanism" theories. Ideas especially focus on walkable neighborhoods, public transportation, affordable housing, new technology, sustainable architecture, and community participation in the context of creating healthy communities. SNU looks at the vitality of urban places and how to maintain and design great urban environments. SNU is composed of three main parts: Education (to teach others and our selves about urban design); Service (to help the communities in our area and be a part of the urban design process) and Connection (act as a facilitator between professionals and students among many disciplines that participate in the planning process).

*Student Association for Women in Architecture (SAWA).* SAWA is designed to encourage gender equality and diversity throughout the School of Architecture, the architecture profession, and our communities by providing a more diverse educational experience. Through collaboration with the AIAS and the SNU, we hold discussion groups with students and faculty, host guest lecturers and exhibits, create community outreach programs where architecture students educate local youth about the architecture school and the architectural profession, and support our local community through service projects.

*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.

*Students for Classical Architecture* promotes discussion regarding how best to incorporate architectural fundamentals into a contemporary curriculum. Students for Classical Architecture also supports local chapters of this organization at other institutions. We seek collaboration between these chapters and encourage dialogue between academic programs, to foster a gradual rebirth of tradition in education. Goals include: support of students around the world interested in traditions of architecture; supplementation of university curricula relevant to classical design through salons, lectures, and tours; lobbying NAAB and universities to offer classical studios, reinstate required history courses and promote an architectural curriculum based in tradition; educating public about the current state of architectural education.

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## 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 21 departments and several programs through which students at both undergraduate and graduate levels pursue the study of the fine arts, the humanities and the social sciences.

**Liberal Education.** The College of Arts and Letters provides a contemporary version of a traditional liberal arts educational program. In the college, students have the opportunity to understand themselves as heirs of a rich intellectual and spiritual tradition and as members of a complex national and international society. The faculty of the college are committed to 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 the College of Arts and Letters takes place in an explicitly Catholic environment. Here ultimate questions of the meaning and value of human life before God are welcome, and efforts to deal with such questions utilize the immense resources of the Catholic tradition. Inquiry and faith are seen not as opposing forces but as complementary elements of the fully human pursuit of truth.

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

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

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

Africana Studies  
 American Studies  
 Anthropology  
 Art:  
   Art History  
   Art Studio  
   Design  
 Classics:  
   Arabic  
   Classics  
     Greek  
     Latin  
   Greek and Roman Civilization  
 East Asian Languages & Cultures:  
   Chinese  
   Japanese  
 Economics  
   Economics  
   International Economics—Arabic  
   International Economics—Chinese  
   International Economics—German  
   International Economics—Japanese  
   International Economics—Romance Languages  
   International Economics—Russian  
 English  
 Film, Television, and Theatre  
 Gender Studies  
 German and Russian Languages and Literatures:  
   German  
   Russian  
 History  
 Irish Language and Literature  
 Mathematics (honors only)  
 Medieval Studies  
 Music  
 Philosophy  
 Philosophy/Theology (joint major)  
 Political Science  
 Program of Liberal Studies  
 Psychology  
 Romance Languages and Literatures:  
   French and Francophone Studies  
   Italian  
   Romance Languages and Literatures  
   Spanish  
 Sociology  
 Theology  
 The college also offers supplementary majors, but not stand-alone first or degree-yielding majors, in:  
 Africana Studies (24 hours)  
 Arts and Letters Pre-health Studies (49 hours)  
 Art History (24 hours)  
 Asian Studies (24 hours)  
 Chinese (24 hours)  
 Classics (24 hours)  
 Computer Applications (CAPP) (24 hours)  
 French (24 hours)  
 Gender Studies (24 hours)  
 German (24 hours)

Greek and Roman Civilization (24 hours)  
 Irish Language and Literature (24 hours)  
 Italian (24 hours)  
 Japanese (24 hours)  
 Latino Studies (24 hours)  
 Medieval Studies (24 hours)  
 Peace Studies (24 hours)  
 Russian (24 hours)  
 Russian and East European Studies (24 hours)  
 Spanish (24 hours)  
 Theology (25 hours)

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

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

The student must have completed at least 24 credit hours and must have satisfied all of the specified course requirements of the First Year of Studies Program: University Seminar; Writing and Rhetoric; two semester courses in mathematics; two courses in science or a foreign language, and two semester courses in physical education and in wellness instruction or in ROTC. (The University seminar will satisfy the relevant requirement in fine arts, literature, history, social science, philosophy or theology.) A student who does not meet these conditions is retained in the First Year of Studies until the conditions are met. The deficiencies must be removed at the Notre Dame Summer Session or in the student's third semester at Notre Dame.

**Description of General College Requirements.** Every student graduating from the College of Arts and Letters must have a minimum of 120 credit hours and must have fulfilled all University, college and major requirements. Unless special permission has been obtained in advance from the Office for Undergraduate Studies, special studies and directed readings courses do not satisfy university or college or major requirements.

University Requirements	Courses
Writing and Rhetoric	1
Mathematics	2
Natural Science	2
*History	1
*Social Science	1
*Theology	2
*Philosophy	2
*Fine Arts or Literature	1
(Physical Education)	2
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\* One of these requirements must be a University Seminar.

## STUDENT AWARDS AND PRIZES

Arts and Letters Requirements	Courses
College Seminar	1
Language	1–3
+History/Social Science	1
*Literature or Fine Arts (whichever is not taken above)	1
Major	8–12
+ <i>In addition to the University requirement of one history and one social science course, the college requires a third course, which can be either history or social science.</i>	

\* *The arts and letters student is required to complete both one fine arts and one literature course.*

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

**Course Load.** The normal course load in the College of Arts and Letters is five courses. The maximum number of credit hours per semester is 17. Overloads for juniors and seniors are allowed only with the permission of the deans in the Office for Undergraduate Studies.

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

**Activity and Experiential Learning Courses.** Three elective credits of the required 120 hours can be derived/obtained from the following activity courses:

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

Exceptions will be made for music majors for music lessons and ensembles. If students complete more than three of these courses, these will appear on a student’s transcript, but the extra credits will be subtracted from the student’s total number of hours at the time the graduation check is made; hence, these will not count toward the 120 hours needed to graduate.

**Pass-Fail.** With permission from the academic dean, juniors and seniors may take one non-major, non-required elective course each semester on a pass-fail grading basis. Only the first course in a student’s minor track may be taken on a pass/fail basis. These declarations must be made during the enrollment period of each semester, and once made, these declarations are irreversible. No Mendoza College of Business (MCOB) course may be taken pass-fail.

**Arts and Letters Degree Credit.** Students may not count both examination and degree credit for the same course toward graduation hours. For example, a student who has advanced placement credit for ROSP 20201 may not take ROSP 20201 and count both toward the 120 hours required in arts and letters. Students also may not count for degree credit both of two equivalent courses taught at Notre Dame. For example, PHIL 10101 and 20201 are considered to be equivalent courses, as are ECON 10015 and 20015. Students should take only one of each pair but not both. In cases where a student has double credit for the same course, the credits for only one course will be counted toward the student’s degree credit, despite the fact that credits for both will appear on the student’s transcript. A list of equivalent math and science courses can be found at the end of the College of Science section of the *Bulletin*. The same rules about double credit apply to them.

No courses in logic will satisfy the University philosophy requirement. After matriculation into the college, it is the expectation that arts and letters students will complete any outstanding science requirements at Notre Dame by their second semester in the college.

**ROTC.** First-year students enrolled in any of the three ROTC programs are exempted from the University’s physical education requirement. Credits received for 10xxx- and 20xxx-level ROTC courses do not count toward a student’s 120 credit hours, despite being recorded on the transcript. They will be manually subtracted from the student’s total number of hours in the graduation check and/or electronically in the Graduation Progress System (GPS) software. The College of Arts and Letters accepts a maximum of 12 free elective credits only for ROTC students from the 30xxx- and 40xxx-level military sciences only. Non-ROTC students may not take ROTC courses for credit toward graduation except by special permission obtained in advance of registering for the course from the deans in the Office for Undergraduate Studies. If a non-ROTC student registers in ROTC classes without first acquiring permission, these credits will appear on the student’s transcript, but the credits will be subtracted manually from the student’s total hours at the time the graduation check is made.

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

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

## Student Awards and Prizes

### COLLEGIATE AWARD IN MODERN AND CLASSICAL LANGUAGES

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

### AFRICANA STUDIES

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

### AMERICAN STUDIES

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

*The James E. and Barbara Murphy Award for Exceptional Journalism*—A 1947 graduate of Notre Dame, James E. Murphy entered the world of journalism while doing graduate work at the Medill School of Journalism, Northwestern University. He then joined ABC News Radio Network as a writer/editor. Murphy migrated to the field of public relations, returning to his alma mater as director of public information. From that day until his last assignment overseeing Notre Dame’s 150th birthday commemoration, Murphy’s influence was felt over the entire panoply of activities advancing the image of the University. After serving as the guiding 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 of journalism minor.

## STUDENT AWARDS AND PRIZES

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

*The Robert DaMatta Excellence in Anthropology Award*—awarded to all students who achieve a 4.0 grade point average in the anthropology major.

*The Paul Farmer Applied Anthropology Award*—awarded to the student who has used his/her anthropological training for public service.

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

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

*The Reverend Raymond W. Murray, C.S.C., Award in Anthropology*—awarded to the outstanding senior majoring in anthropology.

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

**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 PREPROFESSIONAL**

*The Dr. Robert Joseph Barnett Award*—presented to an outstanding Arts and Letters preprofessional 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 preprofessional 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**

*Center for Asian Studies Undergraduate Essay Award*—awarded to the student with the best undergraduate essay 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**

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

*East Asian Languages and Cultures Award*—awarded to a senior for excellence in the study of Chinese.

*East Asian Languages and Cultures Award*—awarded to a senior for excellence in the study of Japanese.

*East Asian Languages and Cultures 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 David and Shari Boehmen Internship Awards*—awarded for outstanding summer internships won by Gender Studies students.

*The Philip L. Quinn Gender Studies Outstanding Essay Award*—awarded to the student with the best undergraduate essay on a topic related to Gender Studies.

## STUDENT AWARDS AND PRIZES

*The Genevieve D. Willis Senior Thesis Award*—awarded to the student(s) judged to have produced the most outstanding senior thesis.

*The Genevieve D. Willis Senior Thesis Grant*—awarded to sophomores and seniors to supplement research for their senior thesis.

## GERMAN AND RUSSIAN LANGUAGES AND LITERATURES

*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 achievement.

## LATIN AMERICAN STUDIES

*The Rev. John Considine, MM Award*—awarded for outstanding student contributions to the study of, or service to, the Catholic Church in Latin America.

*John J. Kennedy Prize for Latin American Studies*—awarded to the senior who has written an outstanding essay on Latin America. (Occasionally there is a runner-up award).

*The George Monteiro Prize*—awarded to the senior who has written an outstanding essay in Portuguese.

## MEDIEVAL STUDIES

*Michel 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.

## 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.

## MAJORS

## Service Awards

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### AMERICAN STUDIES

*J. Sinnott 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.

### PEACE STUDIES

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

### POLITICAL SCIENCE

*George Brinkley Service Award*—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.

## Special Arts and Letters Requirements

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**Language Requirement.** Students in arts and letters are required to reach intermediate proficiency in a foreign language, but “intermediate proficiency” is defined differently in each of the languages, depending on the complexity of the language itself and the intensity of the course. Check with the specific language department or the assistant deans in 104 O’Shaughnessy to determine which courses fulfill the requirements. Students without Advanced Placement or SAT II credit, but who come with some background in the language they elect will be placed by examinations given during first-year orientation and prior to spring preregistration. Departmental placement exams will not be credit-bearing. Students may receive up to eight hours of credit based on their scores on the AP and SAT II tests. If, for some reason, more than eight hours of credit appear on the transcript, the credits beyond eight will be non-counted and will be manually subtracted from the total number of degree credits counting for graduation. Regardless of the scores on these exams, it is impossible for a student to test out of the language requirement in the College of Arts and Letters. Every student in arts and letters must take at least one course at the appropriate level that deals with texts in the original language. For the specific details of a given language offering or program, check with the relevant department.

**College Seminar.** The College Seminar is a unique one-semester course shared by all students majoring 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.

For descriptions of the University requirements, see “University Requirements” in the front section of this *Bulletin*.

## Arts and Letters Programs

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

## Double-Counting

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In the College of Arts and Letters one course may be double-counted one time to fulfill a second major, supplementary major, or minor requirement and a University or college requirement. No course may be double-counted between majors and/or minors or between a first major and University or college requirements. University Seminar, by definition, fulfills a University or college requirement and is not considered a double count under this rule.

## Majors

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

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

Supplementary majors are those that cannot stand alone in qualifying a student for an undergraduate degree but must be taken in conjunction with a

## MINORS

primary major. They include both interdisciplinary and departmental offerings:

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

**Self-Designed Majors.** A program for a special self-designed major was approved by the college council during the 1994–95 year. The self-designed major involves substantive integration of the subject matter in ways that cannot be undertaken within any existing major, minor, area studies, or concentration program.

**The Process:**

1. Interested students, in consultation with three faculty sponsors from at least two departments, should present a detailed written proposal of their major (which has been signed by their faculty sponsors) to the Undergraduate Studies Advisory Committee no later than the Friday before the midsemester break of any semester up to the second semester of the sophomore year. One of the faculty sponsors should be identified as the chair of the supervising committee.

2. Approval of the special major will be granted by the dean, on the recommendation of the Undergraduate Studies Advisory Committee. The committee will review the proposals and communicate their recommendations to the students before the preregistration period begins. As it deliberates, the committee may ask for additional information from the student, faculty sponsors and other colleagues in related areas to assist in further refining and rewriting the original proposal. It is the expectation that the on-campus portions of the major will rely heavily on existing courses.

3. Special majors must culminate in a capstone essay or, where appropriate, other work, which will be evaluated by more than one faculty member. (In most cases, it is assumed that the faculty evaluators will be the faculty sponsors). A detailed proposal of the capstone project must be submitted to the faculty sponsors by November 1 of the senior year.

It is expected that a capstone essay will consist of between 30 and 50 pages (7,500–15,000 words).

4. Changes in an individual program need the approval of the chair of the supervising committee and the dean. If students discover midstream that they are unable to complete the special major, it may be “dropped,” but they must then complete one of the traditional departmental majors. Retroactive proposals will not be considered. Thus, these programs should be well under way by no later than the middle of the junior year.

5. Administration of special majors will take place through the Office for Undergraduate Studies in a manner similar to that of the ALPP program; i.e., students will pick up their PINs in 104 O’Shaughnessy.

6. The college council will periodically review the special major program.

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**Minors**

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Minors are five-course sequences that can either be departmental or interdisciplinary. The college has three categories of minors: Departmental, Interdisciplinary, and Area Studies.

**Departmental:**

Anthropology  
 Art History  
 Art Studio  
 Chinese  
 Classical Literature  
 French and Francophone Studies  
 German  
 Greek  
 Greek and Roman Civilization  
 Irish Language and Literature  
 Italian  
 Japanese  
 Korean  
 Latin  
 Philosophy  
 Portuguese and Brazilian Studies  
 Russian  
 Theology

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

**Interdisciplinary:**

Business Economics  
 Catholic Social Tradition  
 Constitutional Studies  
 Education, Schooling, and Society  
 Gender Studies  
 Hesburgh Program in Public Service  
 International Development Studies  
 Journalism, Ethics, and Democracy  
 Liturgical Music Ministry  
 Medieval Studies  
 Peace Studies  
 Philosophy, Politics, and Economics  
 Philosophy, Religion, and Literature

Philosophy Within the Catholic Tradition  
 Poverty Studies  
 Science, Technology, and Values  
 Technology, Business, and Society

**Area Studies:**

Africana Studies  
 Asian Studies  
 European Studies  
 Irish Studies  
 Latin American Studies  
 Latino Studies  
 Mediterranean/Middle Eastern Studies  
 Russian and Eastern European Studies

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**Electives**

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



## AFRICANA STUDIES

## Africana Studies

### Chair:

(The Rev.) Hugh R. Page Jr., Dean, First Year of Studies; Walter Associate Professor of Theology, Department of Theology

### Joint Faculty:

Stuart Greene, Associate Professor, Department of English  
 Paulinus Odozor, Associate Professor, Department of Theology  
 (The Rev.) Hugh R. Page Jr., Dean, First Year of Studies; Walter Associate Professor of Theology, Department of Theology  
 Richard B. Pierce, John Cardinal O'Hara, C.S.C., Associate Professor of History  
 Dianne Pinderhughes, Professor, Department of Africana Studies and Political Science

### Affiliated Faculty:

Jaimie Bleck, Assistant Professor, Political Science; Concurrent Faculty, Africana Studies  
 Catherine Bolten, Assistant Professor, Fellow of the Kellogg Institute for International Studies; Concurrent Faculty, Africana Studies  
 Darren Davis, Professor, Department of Political Science  
 Robert A. Dowd C.S.C., Assistant Professor, Political Science  
 Cyrainna Johnson-Roullier, Associate Professor, Department of English  
 Paul V. Kollman C.S.C., Associate Professor, Theology; Fellow, Kroc Institute for International Peace Studies  
 Erin McDonnell, Assistant Professor, Sociology; Concurrent Faculty, Africana Studies  
 Rory M. McVeigh, Department Chair; Professor, Sociology  
 Rahul Oka, Assistant Professor, Concurrent Faculty, Africana Studies; Fellow of the Kellogg Institute for International Studies; Fellow of the Joan B. Kroc Institute for International Peace  
 Jacquetta Page, Visiting Faculty, Department of Africana Studies  
 Abby Palko, Assistant Professional Specialist, Gender Studies  
 Jason M. Ruiz, Assistant Professor, American Studies; Fellow, Institute for Latino Studies  
 Todd David Whitmore, Associate Professor, Theology; Concurrent Associate Professor, Concurrent Instructor, Fellow of the Joan B. Kroc Institute for International Peace Studies

### Special Professional Faculty

Maria McKenna, Director of Undergraduate Studies, Africana Studies; Senior Associate Director, Education, School, and Society Program

Please contact the Department of Africana Studies at 631-0397 or [astudies@nd.edu](mailto:astudies@nd.edu), or contact Maria McKenna at [mmckenn9@nd.edu](mailto:mmckenn9@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 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 and an interdisciplinary minor (15 credit hours).

**Please note:** The Introduction to Africana Studies course is only offered in the **fall** of each academic year. While it is not an official pre-requisite for many Africana Studies courses, we recommend students take it prior to other coursework in the department.

### 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, 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, 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, history, and social science

*One elective AFST course* (3 credit hours)

## COURSE DESCRIPTIONS

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

## American Studies

### Chair:

Robert Schmuhl

Walter H. Annenberg-Edmund P. Joyce Professor  
American Studies and Journalism

Thomas Tweed

W. Harold and Martha Welch Professor American  
Studies

### Professors:

Erika Doss, Robert Schmuhl, Thomas Tweed

### Associate Professors:

Annie Coleman, Ben Giamo, Kathleen Sprows  
Cummings, Sophie White

### Assistant Professors:

Perin Gurel, Jason Ruiz

### Visiting Assistant Professors:

Joshua Roiland, Robert Walls

### Adjunct Associate Professor:

Jack Colwell

### Adjunct Assistant Professor:

Terry Bland

### Administrative Assistant:

Katie Schlotfeldt

### Affiliated Faculty

Gail Bederman, Concurrent Associate Professor, Department of Romance Languages and Literatures; Catherine Cangany, Concurrent Assistant Professor, Department of History; Gilberto Cardenas, Concurrent Professor, Department of Sociology; Jon Coleman, Concurrent Professor, Department of History; James Collins, Concurrent Professor, Department of Film, Television, and Theatre; Dennis Doordan, Concurrent Professor, School of Architecture; Stephen Fredman, Concurrent Professor, Department of English; Patrick Griffin, Concurrent Professor, Department of History; Sandra Gustafson, Concurrent Professor, Department of English; Eugene Halton, Concurrent Professor, Department of Sociology; Cyraina Johnson-Roullier, Concurrent Associate Professor, Department of English; Mary Ellen Konieczny, Concurrent Assistant Professor, Department of Sociology; Jose Limon, Concurrent Professor, Department of English; Katie Marshall, Concurrent Assistant Professor, Department of English; Timothy Matovina, Concurrent Professor, Department of Theology; Terry McDonnell, Concurrent Assistant Professor, Department of Sociology; John McGreevy, Concurrent Professor, Department of History; Rebecca McKenna, Concurrent Assistant Professor, Department of History; Kinohi Nishikawa, Concurrent Assistant Professor, Department of English; Susan Ohmer, Concurrent Associate Professor, Department of Film, Television, and Theatre; Richard Pierce, Concurrent Associate Professor, Department of History; Diane Pinderhughes, Concurrent Professor, Department of History; Yael Prizant, Concurrent Assistant Professor, Department

of Film, Television, and Theatre; Valerie Sayers, Concurrent Professor, Department of English; Laura Walls, Concurrent Professor, Department of English; Matthew Wilkens, Concurrent Assistant Professor, Department of English; Pamela Wojcik, Concurrent Professor, Department of English.

**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, a 20000-level course taken at the 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 both the fall and spring semesters, and should be taken before students can take AMST courses at the 30000 and 40000 levels. 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 five different 30000-level courses in AMST, each of which continues to explore concepts, texts, and methods particular to the discipline of American Studies. These classes are divided into three different tracks: (1) American Cultures and Societies, (2) American Identities, and (3) American Political Cultures and Institutions. Students are required to take at least one 30000-level course in each one of these areas, and

faculty advisors will help determine the particular track that courses fit. (In some cases, a course will fit more than one track). The three tracks are oriented toward the following questions and issues:

### 1. American Cultures and Societies

How does the production, distribution, and consumption of expressive practices and forms—including novels, comic books, paintings, toys, ideas, movies, television programs, songs, and other artifacts from both elite and popular culture—reflect the diversity of American experience?

### 2. American Identities

How has the United States' historic experience as a nation of people of diverse ethnic, racial, sexual, religious, and other identities shaped the varied processes by which Americans forge individual and group identities and claim rights to citizenship, and in turn transform the nation's collective identity?

### 3. American Political Cultures and Institutions

How are governmental, economic, and civic institutions embedded within cultural frameworks, and how do they mediate relationships and contending claims among groups and individuals in the United States? Note: All journalism courses, including those that primarily focus on techniques, are placed in this track area.

In addition, AMST majors are required to take three OUTSIDE COURSES that are similarly oriented to the three tracks in the AMST major: (1) American Cultures and Societies; (2) American Identities; and (3) American Political Cultures and Institutions. Students are required to take one course in each of the three tracks. Specific outside courses that are included in these tracks, which are offered in a wide variety of departments and programs at the University of Notre Dame, will be found on lists regularly maintained in the AMST office. As with all courses, students must consult with their faculty advisors about registering for these courses, and once their advisor approves their course selections, the AMST administrative assistant will help students register for courses.

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, with at least seven courses taken in AMST and three courses taken in outside departments that fit within the required AMST tracks:

Major Requirements (course level)	Credits
Introduction to American Studies (20000)	3
5 Upper-Level AMST Courses (30000)	15
Senior Seminar in AMST (40000)	3
3 Outside Courses (30000 or 40000)	9

Total:

30

**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 (up to two times) 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 3 credit hours of course work abroad towards the major. That course will fulfill the requirement for one outside course.

**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.

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 tenured or tenure-track faculty member in AMST and will be the instructor of record for the thesis project; 3) Information on grants applied for and won. Application forms and additional information are available through the departmental website.

Once accepted, students should confirm their plans with their primary advisor and be sure to register in the fall for **Senior Thesis Capstone 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 confer with their advisors regularly. The

secondary advisor's main responsibility is to evaluate the final draft but can also serve as a sounding board at earlier stages. 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 maintain a satisfactory GPA will be asked to abandon their thesis project. Theses will be evaluated by both the primary and secondary advisors. 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. Students seeking departmental honors must submit a one page statement describing their engagement with the field to the department by April 15 of their senior year. 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 [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:**

- *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:*

Agustín Fuentes

### *Edmund P. Joyce Professors of Anthropology:*

Roberto A. DaMatta (emeritus); James J.

McKenna

### *Professors:*

Susan Blum; Leo A. Despres (emeritus); Agustín Fuentes; Ian Kuijt; Carolyn Nordstrom; Carl W.

O'Neill (emeritus); Irwin Press (emeritus); Mark

R. Schurr; Lawrence Sullivan (concurrent)

### *Associate Professors:*

James O. Bellis (emeritus); Meredith S. Chesson;

Rev. Patrick D. Gaffney, C.S.C.; Joanne M.

Mack (emerita); Cynthia Mahmood; Kenneth E.

Moore (emeritus); Susan G. Sheridan

### *Assistant Professors:*

Maurizio Albahari; Christopher Ball; Jada Benn-

Torres; Catherine Bolten; Donna Glowacki;

Rahul Oka; Vania Smith-Oka

### *Assistant Research Professor*

Lee T. Gettler

### *Director of Undergraduate Studies*

Gabriel Torres

### *Visiting Assistant Professor:*

Holly Donahue Singh; Robert Walls

### *Affiliated Faculty*

Douglas Bradley, Concurrent Professional Specialist, Snite Museum; Ann-Marie Conrado,

Concurrent Assistant Professor, Art, Art

History and Design; Paulette Curtis, Associate

Professional Specialist; Diarmuid Ó Giolláin,

Professor, Department of Irish Language

and Literature; David Hernandez, Assistant

Professor, Department of Classics; Tala Jarjour,

Assistant Professor, Department of Music;

Carlos Jáuregui, Associate Professor, Romance

Languages; Peter Jeffery, Professor, Department

of Music; José Limón, Professor, Department

of English, Fellow, Institute for Latino Studies;

Matthew Ravosa, Professor, Department of

Biological Sciences; Karen Richman, Director,

Associate, Professional Specialist, Border and

Interamerican Affairs; Deborah Rotman,

Associate Professional Specialist, Director, Center

for Undergraduate Scholarly Engagement; John

Sherry, Professor, Department Chair Marketing;

Lawrence Sullivan, Professor, Department of

Theology; Todd Whitmore, Associate Professor,

Department of Theology

**Program of Studies.** The undergraduate program in anthropology is designed to provide each student with a broad, holistic, integrated and species-wide perspective on contemporary human behavior. Anthropology may be the only major that provides significant intellectual and professional links with the humanities and other social science fields, while also providing separate bridges into both the natural sciences and the field of business. In so doing the anthropology major prepares students for successful entry into any number of fields and disciplines and their appropriate professional graduate schools,

## ANTHROPOLOGY

including medical schools, public health, and law. 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 specialties of the faculty include China, Southeast Asia, North America, Latin America, Russia, Italy, Ireland, Egypt, Central and Southern Africa, and the Middle East.

In moving toward our goal to achieve national prominence as one of the top undergraduate research and teaching departments in the nation, our faculty stress the importance of innovative and significant undergraduate research. We aim to provide as many majors as is possible with hands-on research experiences in both the field and laboratory. Smithsonian and Chicago Field Museum summer research internships created by the department are available to majors. The department also administers a paid summer internship with J.F. New Environmental Consultants. 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 changes in a most profound and insightful way the manner in which our students experience and come to 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.

Perhaps it is the result of this very personal encounter, experienced alongside exposure to the very best scholarship, that permits our anthropology students to connect so easily and successfully with diverse professional communities. This relative 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 proves a surprisingly powerful beginning point for just about any career.

**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.

## PROGRAMS

1. **The Major.** There are no prerequisites to the major. **The major requires 30 credits, nine of which must be in the sequence of fundamentals, including ANTH 20201 (Fundamentals of Biological Anthropology), ANTH 20202 (Fundamentals of Archaeology), ANTH 20203 (Fundamentals of Social and Cultural Anthropology), and ANTH 20204 (Fundamentals of Linguistic Anthropology).** In addition, **majors must take ANTH 40400 (Perspectives in Anthropological Analysis), one methods course (3 credits), and 15 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 with vote of 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 three of the four fundamentals, ANTH 20201, 20202, 20203, and 20204. In addition, students must take six credits of electives.

Courses taken for pass-fail credit will not satisfy requirements for the major, the honors track, or the minor.

## COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Anthropology*. Course descriptions can be found by clicking on the subject code and course number in the search results.

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

## Art, Art History, and Design

### Chair:

Richard Gray

### Professors:

Rev. Austin Collins, C.S.C.; Jean Dibble; Dennis Doordan; Paul Down; William Kremer; Kathleen Pyne; Charles Rosenberg; Maria Tomasula

### Associate Professors:

Robert Coleman; Richard Gray; Martina Lopez; Rev. Martin Lam Nguyen, C.S.C.; Robin Rhodes; Robert Sedlack

### Assistant Professors:

Ann-Marie Conrado; Danielle Joyner; Jason Lahr; André Murnicks

**The Department.** The Department of Art, Art History, and Design at the University of Notre Dame, as part of the College of Arts and Letters, is dedicated to the liberal education of the whole person. Students in the department, guided by an expert and professionally active faculty, can expect to become critically aware of the rich artistic past and challenged to become a thoughtful maker of contemporary visual expression. An active lecture and visiting artist series and the extensive collections of the Snite Museum of Art strengthen and broaden the work in the classroom and studio. The South Bend and Chicago areas provide additional cultural activities and experiences.

The department has fourteen studio art and design and seven art history faculty. The student may pursue one of three degrees at the undergraduate level: the bachelor of arts (B.A.) in studio art or design, a B.A. in art history, or the bachelor of fine arts (BFA) in studio art or design. Studio concentrations are offered in ceramics, graphic design, industrial design, painting, photography, printmaking, and sculpture. The size of the department enables the serious student to receive a solid foundation and, through advanced courses and personal contact with the faculty, to develop a creative individual direction in a discipline. The department is further enriched by an active graduate program offering the MFA degree in studio art and design and the M.A. degree in art history.

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 offices for the art history faculty are in Decio Faculty Hall. The design classrooms, studios, and design faculty offices are located in West Lake Hall. Skilled technical staff 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.

**Writing-Intensive Requirement:** The Department of Art, Art History, and Design fulfills the College of Arts and Letters writing-intensive requirement

by requiring all majors in each of the three departmental areas (ARST, DESN, and ARHI) to enroll in at least one upper-level (3xxxx or 4xxxx) art history course. All upper-level ARHI courses include a writing component that satisfies the College of Arts and Letters writing-intensive requirement.

### 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 B.A. degree is ideal for the student who desires a liberal education with a strong emphasis in art. Students enrolling in the B.A. degree program are required to complete a five-course core curriculum during their first three semesters. These courses are Drawing I, 2-D Foundations, 3-D Foundations, one course treating material from before 1600 taught by a regular full-time art historian in the department, and one course that treats material from after 1600 taught by a regular full-time art historian in the department. Students are not required to select a major concentration for the B.A. degree, but some focus of study is encouraged. The B.A. degree consists of 36 hours in art and design, of which 27 are in studio and nine in art history.

#### Bachelor of Fine Arts Degree in Studio Art and Design

The bachelor of fine arts degree program in art and design is intended for the student who wishes to pursue a professional career in the visual arts. The program is organized into a four-year sequence of study that provides a solid understanding of art and art history. The student has an opportunity to explore a variety of curricular options and then chooses an intensive and professional major concentration. 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 are in studio and 12 in art history.

### 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. The minor requires 15 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.

#### BFA Freshman and Sophomore Years

Students beginning in the program are required to complete a seven-course studio core curriculum during their first two years. Five of these courses are mandated: Drawing I, Figure Drawing, 2-D Foundations, 3-D 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 B.A. degree. BFA candidates are waived from the second history/social science requirement and the University fine arts requirement.

#### BFA Junior and Senior Years

Students accepted into the BFA program begin a two-year primary concentration in one of the following studio areas: ceramics, graphic 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 Course. 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.

### STUDIO ART AND DESIGN CONCENTRATIONS

#### 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.

#### Design Concentration

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 due to a variety of visual cues. The success resulting from

## ART, ART HISTORY, AND DESIGN

skillfully crafted 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 salvage faltering economies. Undergraduate design education begins at Notre Dame 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 required by designers. Responsible designers aspire to conceive objects with sensitivity for human need, human aspiration, and the functional requirements for both implementing and producing made objects. At its best, design serves a community that includes industry, marketing, consumer, and the environment.

Design has been part of the curriculum at the University of Notre Dame since the early 1950s. Here design students share the advantages of a campus that is rich in contemporary technology and still retains a deep appreciation for a heritage of traditional human values and wisdom. Technically advanced lecture rooms and digital labs support all student design activities. An on site 18-station Mac Lab, a 10-station Surface Modeling PC Lab, a high performance Digital Imaging Studio, and wireless access are all supported by the vast network of software access and services from Notre Dame's Office of Information Technologies. Two model fabrication shops allow pattern-making activities leading to "on site" processing that ranges from plastic molding to foundry casting. Intermediate- and advanced-level undergraduate students share an energized design community with defined studio space located in close proximity to all studio fine arts, art history, and exhibition galleries.

#### Visual Communication Design

At its most basic level, visual communication design is a creative process that combines typography and images to convey a message. In the hands of a talented designer, this message is 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 graphic 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

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.

All students access local Mac and PC computer support from a campus server, a local wireless network, projection-equipped classrooms, and input/output facilities that include on-site multiple (high-quality) large and intermediate size format printing. Basic shop facilities are complemented by access to rapid prototyping, available in the College of Engineering. Notre Dame's Industrial Design Program (NDID) is accredited by the National Association of Schools of Art and Design (NASAD) and maintains student chapter affiliation with the Industrial Designers Society of America (IDSA). NDID interacts with regional, national, and international corporate design and consulting offices in the form of annual conferences, sponsored projects, field trips, and internships.

#### 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

Photographs mediate our involvement with the physical world, taking place at the intersection between art, culture, and our own individual perceptions. The concentration in photography is committed to educating image-makers in a world where photographic imagery and new media representations pervade our everyday experience. From foundation work through graduate studies, courses are designed to inform students about photographic traditions while engaging them in issues and methodologies of contemporary art and professional practice. The photography program seeks to facilitate growth and development of the art student through a range of courses dealing with aesthetic, historical, technical and critical concerns. Students have the opportunity to develop the necessary skills in photography and video needed for professional work. The curriculum is primarily based in digital still and video genres but also includes courses in traditional analog/ darkroom photography.

#### Printmaking Concentration

Printmaking is a medium that bridges the fine art and commercial art worlds. Taking advantage of new methodologies for reproducing pictures, printmaking investigates the drive humans have to make pictures. Looking at the past through the technologies of image reproduction, we can see how print artists manipulate and infuse their images with meaning and intellectual challenges. The invention of stone lithography in 1799 led to offset printing processes that today we use for most image reproduction. By 1803 artists were already exploiting its capabilities to reproduce fine drawing. We teach printmakers to respond to all of the newest image reproduction technologies and to use it to make their art. This art reflects the current intellectual and critical climate within which all artists reside. Our program addresses the technological past and weaves it into our critical and intellectual present. Students learn the technical means to create a body of visual work, are equipped to speak cogently within the parameters of current discourse, see the past and its influence, and are able to recognize print work and its influence upon the present.

#### 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

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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.

### THE ART HISTORY MAJOR

Notre Dame's art history major is designed to equip our students with a broad overview of the development of Western art and to provide them with an in-depth knowledge of particular periods, problems, and research methods. The diversity and scholarly strength of our faculty and the research facilities of the Hesburgh Library, including the Medieval Institute, are supplemented by the rich resource of the Snite Museum of Art. With a permanent collection of over 21,000 works, the Snite Museum not only gives our students an invaluable firsthand acquaintance with important examples from all periods and many cultures—including distinguished collections of old master drawings, 19th- and early-20th-century photographs, and Pre-Columbian art—but also provides a wide range of opportunities for our students to gain practical museum experience in both volunteer and paid positions.

The University of Notre Dame offers a 33-hour Honors Program, a 30-hour first major, a 24-hour supplementary major in art history, and a 15-hour minor. 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.

#### The Honors Track in Art History (by approval) 33 Total Hours

One course or seminar in Ancient Art  
 One course or seminar in Medieval Art  
 One course or seminar in Renaissance or Baroque Art  
 One course or seminar in Modern, American or Contemporary Art  
 Theories of Art (ARHI 43576) (Taught only in the fall.  
 To be taken during junior or senior year)  
 Elective art history seminar  
 Elective art history seminar  
 Elective art history course or seminar  
 Elective art history course or seminar  
 Senior thesis (3 credit hours in the fall and 3 credit hours in the spring of senior year.)

Art history first majors are required to take the Theories of Art seminar. In addition, the department offers courses in four areas of Western art: ancient, medieval, Renaissance and baroque, and modern (19th through 21st centuries). An art history major must take at least one course in each of these areas. It is strongly recommended that the four-course distribution requirement be fulfilled with 20xxx or 30xxx level introductory courses taught by regular art history faculty on campus. Students must also have taken a minimum of two seminars in addition to Theories of Art. The Theories of Art seminar should be taken in either the junior or senior year.

Students wishing to complete a second major in art history should take one course in each of the four departmental areas, two art history seminars, and two electives in art history. It is strongly recommended that the four-course distribution requirement be fulfilled with 20xxx- or 30xxx-level introductory courses taught by regular art history faculty on campus.

Students wishing to minor in art history can do so by taking five art history courses (15 credit hours total). At least one of these courses must treat material prior to 1600, and at least one must treat material from 1600 to the present.

Courses taken for the second major or the minor cannot be counted in more than one university program.

Over the last 10 years, our undergraduate majors have presented scholarly papers at conferences throughout the Midwest; held prestigious summer internships in museums in New York, Washington,

Chicago, and Baltimore; found employment in galleries and museums; and pursued graduate work at Columbia, Berkeley, Cornell University, Yale University, the University of North Carolina-Chapel Hill, the University of Virginia, the University of Texas, and the University of Michigan, among other institutions.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Art History*
- *Art Studio*
- *Design*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## CLASSICS

## Classics

### Chair:

Elizabeth Mazurek

*Eli J. and Helen Shaheen Professor of Classics:*

Keith R. Bradley

### Professors:

Joseph P. Amar (Arabic); W. Martin Bloomer; Li

Guo (Arabic); Daniel J. Sheerin (emeritus)

### Associate Professors:

Elizabeth Forbis Mazurek; Brian A. Krostenko;

David J. Ladouceur; Hildegund Müller;

Catherine M. Schlegel; Isabelle Torrance

### Concurrent Associate Professors:

Blake Leyerle; David O'Connor; Robin Rhodes

### Assistant Professors:

Christopher Baron; David Hernandez

### Associate Teaching Professor:

Tadeusz Mazurek

### Assistant Teaching Professors:

Ghada Bualuan (Arabic); Amaya Martin

(Arabic); Asmaa Shehata (Arabic)

### Visiting Assistant Professor:

Sarah Murray

**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](http://classics.nd.edu).

The department also provides the administrative home for the Program of Arabic Language and Culture.

## 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 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	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
Greek Literature and Culture	3
Roman Literature and Culture	3
6 Classics courses in English or Greek and Latin language offerings*	18
	30

\*Students will be strongly encouraged, but not required, to include some language study in their six elective courses.

Supplementary majors in Greek and Roman Civilization take four (instead of six) elective CLAS courses in translation or in Greek and 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).

### Classical Civilization Minor

The Classical Civilization Minor provides a broadly based orientation to the history and civilization of the classical world. It consists of five courses, three of which are required: The History of Ancient Greece, The History of Ancient Rome, and one course in ancient archaeology. The remaining two courses may be chosen, with departmental approval, either from CLAS courses, whether offered by the department or cross-listed by other programs, or from Greek and Latin language courses.

### Classical Literature (in Translation) Minor

The Classical Literature in Translation Minor provides a broad experience of Greek and Latin literature studied in English translation. It consists of five courses, three of which are required: one course in Greek literature, one course in Roman literature, and Greek and Roman Mythology. The remaining two courses may be chosen, with departmental approval, either from CLAS courses, whether offered by the department or cross-listed by other programs, or from Greek and Latin courses above the introductory level.

## 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 3.5 in the major; (3) complete the Honors Seminar for the senior year; (4) and receive a grade of A- or higher for a 5,000–6,000 word honors thesis. Honors students work closely with a member of the Classics faculty, who guides their research project. For more information see <http://classics.nd.edu/undergraduates/honors-and-research/>.

## PROGRAM OF ARABIC LANGUAGES AND CULTURE

The program in Arabic offers a full range of courses in Modern Standard Arabic, and is geared toward proficiency in speaking, reading, and writing. Courses in Middle East history, culture, and religion complement the language component and give students the opportunity for a broad-based and comprehensive understanding of the Arab world.



## MAJOR IN ARABIC

A total of 32 credit hours distributed in the following areas:

6 courses in Arabic	20
1 course in literature, taught by the Arabic faculty	3
1 course in Middle East history	3
1 course in Islam	3
1 elective, subject to departmental approval	3

## MINOR IN MEDITERRANEAN/MIDDLE EAST STUDIES

An interdisciplinary focus defines this broad-based program that encourages a multidimensional approach to the Mediterranean world. This is achieved through a wide variety of courses and activities offered by departments that study southern Europe, North Africa, or the Middle East.

While language courses may serve as a component of the minor, students are offered opportunities to view the region in its full historical, cultural, and political context. In this way, students are given the opportunity to assemble a course of studies that best reflects their own interests.

Typical areas of focus might include the rich culture that developed in southern Spain as a result of the Christian, Muslim, and Jewish interactions there; the impact of the French language and culture on North Africa and the Middle East; or the contemporary Israeli-Palestinian conflict.

**Requirements:** (1) Intermediate Arabic (MEAR 20003); (2) the student's choice of three courses that relate to the region of southern Europe, North Africa, or the Middle East; and (3) a final research thesis that integrates coursework related to the student's area of interest.

## SYRIAC STUDIES

Syriac is a form of Aramaic that was the literary language of Jews and pagans in western Asia before expanding to become the common dialect of Aramaic-speaking Christians throughout the region. Early literature in Syriac preserves sustained evidence of the distinctive character of Aramaic-speaking Christianity that is largely unhellenized and that reflects the linguistic and cultural milieu of first-century Palestine.

Syriac literary culture reveals mutual and parallel dynamics in the development of Syriac Christianity and the emergence of Rabbinic Judaism. The study of Syriac is likewise of pivotal importance to an understanding of the thought-world of the pre-Islamic Middle East, the established Christian and Arab populations of the region, and the emergence of Islam in the seventh century.

## STUDY ABROAD

Our students are encouraged to study abroad for a semester, especially in the Mediterranean basin. The Department supports programs offered by the Intercollegiate Center for Classical Studies in Rome, College Year in Athens, and the American University in Cairo. 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/](http://classics.nd.edu/summer-programs/).

## COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- *Classics in Translation*
- *Greek Language and Literature*
- *Latin Language and Literature*
- *Arabic Language and Literature*
- *Hebrew Language and Literature*
- *Middle East Literature in Translation & History*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## East Asian Languages & Cultures

### Chair:

Dayle Seidenspinner-Nunez

### Research Professor:

Robert M. Gimello

### Associate Professors:

Michael C. Brownstein; Liangyan Ge; Lionel M. Jensen; Xiaoshan Yang; Yongping Zhu

### Professional Specialist

Noriko Hanabusa

### Associate Professional Specialists:

Chengxu Yin; Yeonhee Yoon

### Assistant Professional Specialist:

Congcong Ma; Jia Yang; Naho Maruta

**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 First-Year Chinese, Korean, or Japanese (10 credits) 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 International Study Programs (See "International Study Programs" 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 beginning, first-, second-, third-, and fourth- and advanced-year levels, 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 courses in residence in Chinese literature and culture, including one course in Chinese literature, which must be taught by a departmental faculty member. 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 beginning, first-, second-, third-, and fourth- and advanced-year 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 and minors must take three upper-division courses in residence in Japanese literature and culture, including one course in Japanese literature, which must be taught by a departmental faculty member. Remaining credit hours may be satisfied by taking additional Japanese language and literature courses, or other East Asia-related courses 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 either Chinese or 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.

## MAJOR IN INTERNATIONAL ECONOMICS IN CHINESE

The newly-created 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 are also required to enroll in a one-credit "Exploring International Economics", preferably their sophomore year, designed to foster the integration of the study of culture with the study of economics. Students must complete a minimum of four semesters of Chinese language courses through the fourth-year level, including the one-credit fourth year supplements in Business Chinese.

Students must also take a minimum of three upper division courses in Chinese literature and culture, including at least one literature course taught by EALC faculty.

In their senior year, students have the option of writing a senior capstone essay that integrates their economic and language and culture study or taking the two-semester sequence in fifth year Chinese. The senior capstone project may be a senior thesis under the guidance of a faculty member from Economics or East Asian Languages and Cultures or a research seminar paper that focuses on a topic or topics related to the economic, linguistic, and cultural characteristics of a country or countries where Chinese is spoken.

Refer to the Department of Economics for the relevant course requirements in economics which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30331; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

## MAJOR IN INTERNATIONAL ECONOMICS IN JAPANESE

The newly-created 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 are also required to enroll in a one-credit "Exploring International Economics", preferably their sophomore year, designed to foster the integration of the study of culture with the study of economics. Students must complete a minimum of four semesters of Japanese language courses through the fourth-year level, including the one-credit fourth year supplements in Business Japanese.

Students must also take a minimum of three upper division courses in Japanese literature and culture, including at least one literature course taught by EALJ faculty.

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In their senior year, students have the option of writing a senior capstone essay that integrates their economic and language and culture study or taking the two-semester sequence in fifth year Japanese. The senior capstone project may be a senior thesis under the guidance of a faculty member from Economics or East Asian Languages and Cultures or a research seminar paper that focuses on a topic or topics related to the economic, linguistic, and cultural characteristics of a country or countries where Japanese is spoken.

Refer to the Department of Economics for the relevant course requirements in economics which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30331; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

### PROGRAM IN KOREAN

The University offers two 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 MINOR

See "Area Studies Minors," later in this section of the *Bulletin*. This minor provides opportunities for students to develop an interdisciplinary understanding of Asia.

### EAST ASIAN LANGUAGES & CULTURES STUDY-ABROAD PROGRAMS

Students have opportunities to study abroad for either a semester or a year in the People's Republic of China and Japan at the following locations:

**Beijing, China:** The program at Peking University 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.

**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 [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- *East Asian Languages & Literature*
- *Chinese*
- *Japanese*
- *Korean*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## Economics

### Chair:

Richard A. Jensen

*David R. and Erin M. Seng Jr. Chair:*

Joseph Kaboski

*DeCrane Professor of International Economics:*

Nelson C. Mark

*Gilbert F. Schaffer Professor of Economics:*

Richard A. Jensen

*Keough-Hesburgh Professor:*

William Evans

*William and Dorothy O'Neill Professor of Economics:*

Timothy Fuerst

*Stepan Family Associate Professor of Economics:*

Daniel Hungerman

*Michael P. Grace II Assistant Professor of Economics:*

Eric R. Sims

### Professors:

William Evans; Robert Flood; Timothy Fuerst; Thomas Gresik; Richard Jensen; William Leahy; Nelson C. Mark; Christopher J. Waller

### Associate Professors:

Daniel Hungerman; Joseph Kaboski; Byung-Joo Lee; Michael Pries; Kali P. Rath; James Sullivan

### Assistant Professors:

Simeon Alder; Wyatt Brooks; Kasey Buckles; Kirk Doran; Antoine Gervais; Andreas Hagemann; Terence Johnson; Ethan Lieber; Steven Lugauer; Sarah Miller; Eric R. Sims; Jeff Thurk; Abigail Wozniak

### Professional Specialists:

Mary Flannery; Michael Mogavero

### Director of Undergraduate Studies:

Mary Flannery

### Undergraduate Advisors:

Mary Flannery; William Leahy; Michael Mogavero

**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 (10010/10011/20010/20011 and 10020/20020 or equivalent). Beyond the Principles courses, the major requires a minimum of eight (8) additional course (24 credits) in economics at the junior/senior level (numbered 3xxxx or 4xxxx).

#### (ii) *Math Requirement*

A course in Calculus (Math 10260 or equivalent) is a prerequisite for both of the intermediate theory

## ECONOMICS

courses. (See core requirement below). Simultaneous enrollment in Calculus II is permitted but not recommended.

**Recommendation:** It is strongly recommended that students, especially prospective economic majors, who have not had a course in Calculus I (Math 10250 or equivalent) enroll in the calculus course during their first year of study.

*(iii) Core Requirement*

Students must include the following four courses among their minimum of eight courses in economics beyond the Principles course.

- 30010 Intermediate Economic Theory Micro
- 30020 Intermediate Economic Theory Macro
- 30330 Statistics for Economists
- 30331 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 (30331) as a prerequisite.

*(v) Writing-Intensive Requirement*

In completing the minimum of 24 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 3xxxx/4xxxx-level economics seminar course; by taking a three credit special studies course consistent with the college's writing-intensive guidelines under the direction of an economic faculty member; or by writing a senior honors essay under the direction of an economic faculty member.

Departmental advisors will assist students in designing a program of study that meets their educational and career goals. Students are also encouraged to pursue related courses in other departments of the College of Arts and Letters, The Mendoza College of Business and the College of Science. Materials relating to professional work or graduate study in economics, law, business, public policy, foreign service are available from the director of undergraduate studies.

**Undergraduate Economics Honors Program**

*Entry Gate.*

To be eligible for admission to the Undergraduate Economic Honors Program, the student must:

(i) Complete Intermediate Economic Theory-Micro (Econ 30010), Intermediate Macro Theory (Econ 30020), and Econometrics (Econ 30331) with minimum grade point average in these courses of A- (3.667).

or

(ii) Have a minimum cumulative GPA of 3.4 and minimum GPA of A- (3.667) in Principles of Microeconomics (Econ 10010/10011/20010/20011), Principles of

Macroeconomics (Econ 10020/20021) Intermediate Economic Theory-Micro (Econ 30010), Intermediate Macro Theory (Econ 30020), Statistics for Economists (30330), and Econometrics (Econ 30331).

To apply for admission, the student must complete an application form, available from the director of undergraduate studies in Economics, between the end of the sophomore year and the end of the junior year. The application will include: (1) a paragraph explaining why the student wishes to enroll in the honors program, and (2) a signature by a member of the economics faculty who endorse this student's application. The application will be returned to the director of undergraduate studies in Economics who will make recommendations for admission to the Undergraduate Studies Committee, which is responsible for the final decisions.

*Enriching Experience.*

The Undergraduate Economics Honors Program requires that the student complete an enriching experience. The following qualify as an enriching experience:

(i) Completion with a grade B+ or higher of an "advanced methods" course, defined as a 4xxxx-level course in which students are required to apply methods of modern economic research. A list of these courses is available from the director of undergraduate studies.

(ii) Completion with a grade of B or higher of a course in the core of the graduate program in economics.

(iii) Completion of some substantive out of classroom activity directly related to the study of economics, such as presentation of the student's own original research at an external conference, an undergraduate research assistantship, an internship, or community service.

All of these activities need to be pre-approved. Students who want pre-approval for a specific activity should submit a written request with other supporting material to the director of undergraduate studies in Economics who will notify applicants of the committee's decision.

*Capstone experience.*

The capstone experience represents the final requirement for the Undergraduate Economic Honors Program. This experience involves three elements:

(i) Completion of a one-credit honors seminar (Econ 47961) in each semester of the senior year. The seminar not only provides instructional support for these students, but also requires each student to present progress reports to their peers at regular intervals. These seminar credits do not count as regular major (i.e., do not substitute for 3xxxx or 4xxxx-level elective economics courses) and are graded on a Satisfactory/Unsatisfactory basis. These seminars are open to juniors in the honors program who want advanced insight to what the honors essay entails.

(II) Completion of a six credit senior honors essay (with a grade of B+ or higher). The essay is directed by an economics faculty member and represents a significant research effort. The writing of the essay is accomplished over the two semesters of the student's senior year with three credits awarded each semester (Econ 47960). These credits can be counted as economics electives toward the major and can be used to satisfy the major's writing-intensive requirement. The results of the essay must be presented at the economics seminar open to the public during the end of the second semester of each academic year.

(ii) Participation in all College of Arts and Letters events for departmental honors students.

**MAJOR IN INTERNATIONAL ECONOMICS**

The newly-created undergraduate major in International Economics is a collaborative effort between the Department of Economics and the departments of languages and literatures affiliated with the International Economics major. In pursuing this major, students take a minimum of eight economics courses and seven to ten intermediate and advanced courses in one of the following languages: Arabic, Chinese, French, German, Italian, Japanese, Russian and Spanish. Students are also required to enroll in a one-credit course "Exploring International Economics" designed to foster the integration of the study of culture with the study of economics. Under the guidance of a faculty mentor, it is recommended that International Economics majors integrate their economic and language and culture study into a Senior Capstone research paper/project or senior thesis. The senior capstone project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a language.

Students must satisfy a mathematics requirement of Calculus I and II and successfully complete ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720. Students should refer to their language department for specific language, literature and culture requirements.

Through the new 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.

## THE MINOR IN BUSINESS ECONOMICS

The minor in Business Economics comprises 15 credits. It is open to students who have a major in the College of Arts and Letters. All students are required to take Principles of Microeconomics; Principles of Macroeconomics; Statistics; Introductory Accountancy and Introductory Finance. Students may count one of the above courses to fulfill a University requirement. Students may not double-count any of the above courses to fulfill the requirements of their major—but Psychology or Sociology majors can use their respective departmental statistics course to fulfill the statistics requirement of the minor. No more than one course in the minor may be taken at another institution. Prior approval is required for this and for transfer credit that is applied to satisfy the requirements of the minor. No AP credit will be accepted as a substitute for courses in the minor but may qualify a student for a higher level course. The minor is not open to students majoring in Economics.

### COURSE DESCRIPTIONS

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

## English

### Chair:

Valerie Sayers

### Director of Undergraduate Studies:

Chris R. Vanden Bossche

### Director of Graduate Studies:

Elliott Visconsi

### Director of Creative Writing:

Orlando Menes

### William R. Keenan Chair of English:

Joseph A. Buttigieg

### John and Barbara Glynn Family Professor of Literature:

Margaret Anne Doody

### Notre Dame Chair:

Katherine Kerby-Fulton

### Mary Lee Duda Professor of Literature:

John Sitter

### William P. and Hazel B. White Chair:

Laura Dassow Walls

### Notre Dame Professor of American Literature:

José Limon

### Professors:

Christopher Abram; Jacqueline Vaught Brogan (emeritus); Gerald L. Bruns (emeritus); James M. Collins (concurrent); Seamus Deane (emeritus); James P. Dougherty (emeritus); Stephen M. Fallon; Christopher B. Fox; Stephen A. Fredman; Dolores W. Frese; Sonia G. Gernes (emeritus); Sandra Gustafson; Peter Holland (concurrent); Greg P. Kucich; Michael Lapidge (emeritus); Jill Mann (emeritus); John E. Matthias (emeritus); Lewis E. Nicholson (emeritus); Katherine O'Brien O'Keeffe (emeritus); William O'Rourke; Valerie Sayers; Donald C. Sniegowski (emeritus); Chris Vanden Bossche; Henry Weinfield (concurrent); Thomas Werge

### Associate Professors:

John Duffy; Barbara J. Green; Stuart Greene; Susan Harris; Romana Huk; Cyraia Johnson-Roullier; William J. Krier; Jesse Lander; Sara Maurer; Joyelle McSweeney; Orlando Menes; Susannah Monta; David Thomas; Steve Tomasula; Elliott Visconsi

### Assistant Professors:

Mary Burgess Smyth; Jesse Costantine; Johannes Goransson; Z'Ettoile Imma; Kate Marshall; Kinohi Nishikawa; Yasmin Solomonescu; Matthew Wilkens; Katherine Zieman

### Professional Specialists:

Noreen Deane-Moran

**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, and medicine, as well as myriad other fields. An increasing number of English majors go into service projects and programs such as Teach for America.

**Major Requirements.** The English major requires a minimum of 10 courses (30 credit hours) in addition to the literature course required of all students in the College of Arts and Letters. In completing the 10 courses, students must satisfy the following requirements:

### Introduction to Literary Studies (ENGL 30101).

This course, which introduces students to college-level study of literature, is a concurrent prerequisite for the major (i.e., students cannot take a major elective unless they have completed this course or are currently enrolled in it).

**Research Seminar.** In the research seminar (numbered ENGL 43xxx), students complete an original and substantial research project. With the approval of the director of undergraduate studies and the instructor, students may take a graduate course in place of the research seminar. The research seminar does not fulfill a distribution requirement.

**Elective courses.** Eight English courses at the 30xxx or above.

**Distribution requirement.** In selecting elective courses, students must fulfill the following distribution requirements:

### History:

1 course in the period before 1500  
1 course in the period 1500–1700  
2 courses in the period 1700–1900  
1 course after 1900

### Culture:

1 course in British literature  
1 course in American literature  
1 course in a literature in English outside of Britain and the United States or in American ethnic minority literature

### Genre:

1 course predominately concerned with poetry  
2 courses predominantly concerned with a genre from the following list: fiction, drama or film, critical theory

A single course can fulfill the requirement in more than one distribution category, but it may not satisfy more than one category. For example, a survey of Renaissance literature might count for 1500–1700 (history), British literature (culture), and drama (genre), but would not count for both poetry and drama (two genre categories).

Creative writing courses may satisfy the genre requirement, but no more than two may count toward the major.

## FILM, TELEVISION, AND THEATRE

The number of courses needed to satisfy the distribution requirement will vary, depending on the courses the student selects, but not all electives need fulfill a distribution requirement.

Research seminars do not fulfill the distribution requirement.

**Concentration in Creative Writing.** The philosophy of the Department of English is that in order to produce good literature, you must know good literature. In order to complete the concentration, therefore, the student must be an English major and complete all of the requirements for the major.

**Requirements.** In addition to completing the requirements for the major, students must take four creative writing courses from a list approved by the department, two of which, if taken at the 30xxx or 40xxx level, may count towards the ten courses required for the English major (meaning that at completion students will have taken a minimum of twelve English courses at the 30xxx or 40xxx level). One 20xxx-level creative writing course may count toward the concentration. One of the four creative writing courses must be either Advanced Fiction Writing (40850) or Advanced Poetry Writing (40851).

**Admission to the Concentration.** Students wishing to complete the concentration must apply to the department after taking two creative writing courses in accord with the guidelines above. The Creative Writing Committee will determine whether to admit students to the concentration on the basis of the recommendations of the instructors of those two courses. In cases in which it is not possible to obtain such recommendations, a student may supplement his or her application with a portfolio of creative writing.

**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 English Honors Concentration is particularly beneficial to students wishing to pursue graduate studies in English. 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 the Honors Colloquium (which replaces the research seminar); in the spring of senior year, the student enrolls

in ENGL 52999, Honors Thesis 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 Honors Concentration. In the fall of the senior year, they must enroll in the Creative Writing Honors Colloquium (or the equivalent as determined by the department); in the spring of the senior year, the student enrolls in ENGL 52999 (Honors Thesis) to complete the writing of the thesis. The thesis will consist of an abstract, a critical essay on the writing project (10–15 pages), approximately forty pages of prose (e.g., a section of a novel or a selection of short stories) or twenty pages of poetry, and a works cited. The concentration thus requires 39 credit hours

### COURSE DESCRIPTIONS

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

## Film, Television, and Theatre

### Department Chair:

James M. Collins

### Endowed Professors:

*McMeel Family Chair in Shakespeare Studies*

Peter Holland

*Joseph and Elizabeth Robbie Professor of Film, Television, and Theatre:*

Donald Crafton

### Endowed Associate Professors:

*The William and Helen Carey Chair in Modern*

*Communication:*

Susan Ohmer

### Professors:

James M. Collins; Briona Nic Dhiarmada (concurrent); Jill Godmilow (emerita); Anton Juan; Mark C. Pilkinton; John Welle (concurrent); Pamela Wojcik

### Associate Professors:

Reginald F. Bain (emeritus); Christine Becker; Kevin C. Dreyer; Susan Ohmer; Frederic W. Syburg (emeritus)

### Assistant Professors:

Anne Garcia-Romero; Yael Prizant

### Professional Specialists (Teaching Professors):

William Donaruma; Richard E. Donnelly; Siiri Scott

*Ryan Producing Artistic Director, Notre Dame*

*Shakespeare Festival:*

Grant Mudge (concurrent Assistant Professional Specialist)

### Associate Professional Specialists:

C. Ken Cole; Theodore E. Mandell; Marcus Stephens

*Adjunct Assistant Professional Specialist, Internship*

*Coordinator:*

Karen Heisler

### Instructor:

Gary Sieber (adjunct); William L. Wilson (adjunct)

**The Department.** The Department of Film, Television, and Theatre curriculum includes study of the arts of theatre and performance, film and video, and television. Our goal is to provide students with intellectual and intuitive resources for analysis and production of these performing and media arts. We seek both to encourage and inspire intellectual discipline and curiosity as well as to discover and nurture student creativity. We offer, therefore, both a scholarly and creative context for education of the general liberal arts student at Notre Dame as well as the individual seeking an intensive preparation for advanced study in these fields. In an interdisciplinary spirit of collaboration, students in this department investigate film, television, and theatre (and occasionally other media) as complex cultural phenomena to develop skills in analysis, evaluation, and theory formation as well as to engage in creative production.

## FILM, TELEVISION, AND THEATRE

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.

All 40xxx-level critical studies electives in film and television, and selected theatre electives, will fulfill the writing-intensive requirement.

Many FTT courses fulfill the University fine arts requirement.

For more information and up-to-date listings of courses and FTT events, visit the Web at [ftt.nd.edu](http://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. You also may visit our website at [ftt.nd.edu](http://ftt.nd.edu).

Step-by-step instructions for becoming a major are available on our website. Students may elect to major in the department as either a first or second major in accordance with college guidelines.

Students concentrate in either film, television or in theatre. Ten courses are needed to complete the major. The film concentration requires one elective on an international subject and three courses at the 40000 level. The television concentration requires seven electives, three at the 40000 level. The theatre concentration requires six electives, one each from Groups A, B and C. The remaining electives may be from any Group.

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 Honors Program

Starting with the Fall 2012 semester, the Department of Film, Television, and Theatre will transform its Honors program by combining it with a new Senior Thesis Program. The changes are intended to better serve those students who aspire to complete a major research project in their senior year and to reward the most outstanding work.

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

4 required core courses:

- Basics of Film and Television
- History of Film I (fall only)
- History of Film II (spring only)
- Film and Television Theory

6 electives (3 at the 40000 level, including 1 international elective at either the 30000 or 40000 level)

#### General Electives

- Introduction to Film and Television Production
- The Art and Science of Filmmaking
- Film and Digital Culture
- History of Documentary Film
- Topics in Media Theory: Film and Popular Music
- The Art and Science of Screenwriting
- Media Internship

#### International Electives (30xxx and 40xxx Level)

- Italian National Cinema
- Comedy Italian Style
- French Cinema
- New Iranian Cinema
- Irish Cinema and Culture
- Australian Cinema
- Hong Kong: Action Cinema

#### Upper-Level Electives

- Shakespeare and Film
- Intermediate Filmmaking
- Advanced Filmmaking
- Sex and Gender in Cinema
- Walt Disney in Film and Culture
- Contemporary Hollywood
- Postmodern Narrative
- Documentary Video Production
- Sinatra

#### TELEVISION STUDIES CONCENTRATION

10 courses

3 required core courses:

- Basics of Film and Television
- History of Television
- Film and Television Theory

7 electives (3 at the 40000 level)

- Broadcast Journalism
- History of Film I & II
- Writing for Screen and Stage I and II
- Introduction to Film and Television Production
- Film and Digital Culture
- Topics in Media Theory, History, and Research
- Broadcasting and Cable

- Sports Journalism
- Entertainment and Arts Law
- Media Ethics
- Media and the Presidency
- Media Stardom and Celebrity Culture
- Advanced Filmmaking
- Contemporary Hollywood
- Media Culture
- Media Internship
- Special Studies
- Issues in Film and Media
- Walt Disney in Film and Culture
- Sinatra

#### THEATRE CONCENTRATION

10 courses:

4 required core courses

- Theatrical Production
- Script Analysis
- Theatre, History, and Society (either section)
- Performance Analysis

6 elective (1 from each groups A, B, and C)

#### Group A

- Science Play
- Latin American Theatre
- History of Costume
- Advanced Dramaturgy
- Early English Theatre
- Shakespeare and Film
- Dramatic Text, Production & Social Concerns

#### Group B

- Scene Design
- Lighting Design
- Costume Design

#### Group C

- Acting: Process
- Viewpoints for Actors and Directors
- Voice and Movement

#### Additional Electives

- Introduction to Theatre
- Stage Management
- Playwriting
- Make-up for the Stage
- Scenic Painting
- Draping and Flat Patterning
- Acting: Character
- Acting: Text and Technique
- Directing: Process
- Classical Texts and Techniques
- CAD for the Stage
- Advanced Technical Production

#### 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

## GENDER STUDIES

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 [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Film, Television, and Theatre*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## Gender Studies

### Director:

Pamela Robertson Wojcik

### Director of Undergraduate Studies:

Abigail Palko

### Program Coordinator:

Linnie Caye

### Senior Fellows:

Gail Bederman, Associate Professor, Department of History; Meredith Chesson, Associate Professor, Department of Anthropology; Jessica L. Collett, Associate Professor, Department of Sociology and a faculty fellow at the Kroc Institute for Peace Studies; Kathleen Cummings, Assistant Professor, Department of American Studies; Barbara Green, Associate Professor, Department of English; Catherine Hilkert, Professor, Department of Theology; Cyraina Evelene Johnson-Roullier, Associate Professor, Department of English and a Fellow in the Institute for Latino Studies; Janet Kourany, Associate Professor, Department of Philosophy and Fellow of the Reilly Center for Science, Technology, and Values; Kathleen Pyne, Professor of Art History in Art, Art History; Alison Rice, Associate Professor of French, Department of Romance Languages and Literatures and Fellow in the Nanovic Institute for European Studies; Pamela Wojcik, Professor, Department of Film, TV and Theatre and Director of Gender Studies

### 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, supplementary major and a minor. In the major and supplementary major, students choose a concentration in Arts and Culture, Religion and Family, or Gender and Society. These concentrations allow students to

focus their study of Gender to prepare them for their senior capstone project—senior seminar, capstone essay or a two semester thesis.

### Requirements for Primary Major:

10 courses, 30 credit hours

#### Two required courses:

Introduction to Gender Studies

Perspectives on Gender: Theory and Practice

#### 1 senior capstone project:

senior seminar or senior thesis

#### Seven (7) electives:

- at least 1 elective must fulfill diversity requirement
- at least 2 electives at 40000 level or higher
- at least 4 courses in one of the following concentrations:
  - Arts and Culture
  - Religion and Family
  - Gender and Society

### Requirements for Supplementary Major:

8 Courses, 24 credit hours

#### Two required courses:

Introduction to Gender Studies

Perspectives on Gender: Theory and Practice

#### 1 senior capstone project:

senior seminar or senior thesis

#### Five (5) electives:

- at least 1 elective must fulfill diversity requirement
- at least 1 elective at 40000 level or higher
- at least 3 courses in one of the following concentrations:
  - Arts and Culture
  - Religion and Family
  - Gender and Society

Senior Capstone projects must be in student's area of concentration

Perspectives on Gender and Capstone courses are taken in addition to the 40000 level or higher courses needed

Elective courses can fulfill more than one elective requirement

### Requirements for Interdisciplinary Minor:

5 courses, 15 credit hours

#### Two required courses:

Introduction to Gender Studies

Perspectives on Gender: Theory and Practice

#### Three (3) electives

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Gender Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.



## German and Russian Languages and Literatures

### Chair:

David W. Gasperetti

*Rev. Edmund P. Joyce, C.S.C., Professor of German Language and Literature:*

Mark W. Roche

*Paul G. Kimball Professor of Arts and Letters:*

Vittorio Hösle

### Professors:

Vittorio Hösle; Randolph J. Klawiter (emeritus); Klaus Lanzinger (emeritus); Thomas G. Marullo; Robert E. Norton; Vera B. Profit; Mark W. Roche; Konrad Schaum (emeritus)

### Associate Professors:

Tobias Boes; David W. Gasperetti; Alyssa W. Gillespie; Albert K. Wimmer (emeritus)

### Assistant Professor:

Carsten Dutt; Claire Jones

### Teaching Professor:

Denise M. Della Rossa; Hannelore Weber

**Program of Studies.** The study of German and Russian languages and literatures provides educational opportunities relevant to an increasingly interdependent world. The acquisition of foreign language skills in general is an important component of liberal education because it enhances students' powers of communication and serves to introduce them to enduring cultural achievements of other peoples. In this sense, the study of German and Russian widens students' intellectual horizons, stimulates the understanding of several significant cultural traditions and allows the examination of these traditions in a more sophisticated and cosmopolitan manner.

The goal of all levels of language courses are oral and reading competence and linguistic and stylistic mastery. Courses in advanced German or Russian language, literature, culture and civilization expose the student to a wealth of literary, cultural and humanistic traditions as well as facilitate a better understanding of the rich national cultures of the German- and Russian-speaking countries.

**The Department.** The Department of German and Russian Languages and Literatures offers instruction in German and Russian at all levels of competence, from beginning language courses at the 10xxx level to literature and civilization courses on the 30xxx and 40xxx levels.

## THE GERMAN PROGRAM

*Director of Undergraduate Studies:*

Denise M. Della Rossa

### REQUIREMENTS: FIRST MAJOR, SUPPLEMENTARY MAJOR, AND MINOR

#### First Major

Successful completion of 10 courses (30 credit hours) beyond the three-semester language requirement.

These 10 courses must include successful completion of 20202 (or 20212), 30104, and 30204 and an additional 7 electives at the 30000- or 40000-level. 20202 (or 20212) is a prerequisite to 30104 and 30204, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 10 courses, 4 must be upper-division courses at the home institution from departmental offerings; 2 must be at the 40000-level; and 2 may be in English.

#### Supplementary Major

Successful completion of 8 courses (24 credit hours) beyond the three-semester language requirement.

These 8 courses must include successful completion of 20202 (or 20212), 30104, and 30204 and an additional 5 electives at the 30000- or 40000-level. 20202 (or 20212) is a prerequisite to 30104 and 30204, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 8 courses, 3 must be upper-division courses at the home institution from departmental offerings; 1 must be at the 40000-level; and 2 may be in English.

#### Major in International Economics in German

The undergraduate major in International Economics is a collaborative effort between the Department of Economics and affiliated departments of languages and literature. In pursuing this major, students take a minimum of eight economics courses and six courses in German beyond the language requirement. Students 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 capstone research paper/project or senior thesis. This project/paper or thesis is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of German studies.

*German Requirements:* Successful completion of 6 courses (18 credit hours) beyond the three-semester language requirement. All students are required to take LLRO 33000: Exploring International Economics (one credit).

These 6 courses must include successful completion of 20202 (or 20212), 20113, 30104 and 30204 and an additional 2 electives; one of which must be at the 40000-level; one of which may be taught in English. 20202 (or 20212) is a prerequisite to 30104 and 30204, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 6 courses, 2 must be upper-division courses at the home institution from departmental offerings.

Refer to the Department of Economics for the relevant course requirements in economics which include satisfying a mathematics requirement of Calculus I and II and successful completion of ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30331; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

#### Minor

Successful completion of 5 courses (15 credit hours) beyond the three-semester language requirement.

These 5 courses must include successful completion of 20202 (or 20212), 30104, and 30204 and an additional 2 electives at the 30000- or 40000-level. 20202 (or 20212) is a prerequisite to 30104 and 30204, which may be taken in any order. At least one of these courses, preferably both, must be completed before taking an elective.

Of these 5 courses, 2 must be upper-division courses at the home institution from departmental offerings; and 1 may be in English.

**Study Abroad:** Students who participate in a study abroad program during the academic year must take at least 1 course from departmental offerings after their return to the home campus. Only one intensive language course taken abroad, whether completed during a summer program or the academic year, will count as an elective toward the first major, supplementary major, or minor.

#### Senior Thesis and Departmental Honors

German first 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.)

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 48499. These credits do not count toward the 30-credit hour requirement for the first 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 his or her thesis work in a public forum, such as Notre Dame's *Undergraduate Scholar's Conference* held each May or at a similar 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 RUSSIAN PROGRAM

*Director of Undergraduate Studies:*  
David Gasperetti

### The Major in Russian

Majors in Russian must complete ten courses (thirty credit hours) beyond the three-semester language requirement, including at least six courses taught by departmental faculty. Intermediate Russian II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in Russia are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take four three-credit literature or culture courses offered by the department at the 30000 level or above, including at least one course each at the 30000 and 40000 levels. With the permission of the Director of Undergraduate Studies, one course on a Russian subject taught in another department, such as anthropology, history, political science, or theology, may be counted toward the Russian major.

### The Supplementary Major in Russian

Supplementary majors in Russian must complete eight courses (twenty-four credit hours) beyond the three-semester language requirement, including at least four courses taught by departmental faculty. Intermediate Russian II and Advanced Russian I and II are required courses. However, participants in an approved semester-long program in Russia are automatically exempted from the language course that is offered concurrently with their semester abroad. In addition, students are required to take two three-credit literature or culture courses offered by the department, one at the 30000 level and one at the 40000 level. With the permission of the Director of Undergraduate Studies, one course on a Russian subject taught in another department, such as anthropology, history, political science, or theology, may be counted toward the Russian supplementary major.

### The Major in International Economics in Russian

Combining the study of economics with the knowledge of another country's language and culture can be a powerful advantage in business. The Major in International Economics in Russian is designed to provide this edge by preparing students for the challenges of an ever more interconnected global economy. The requirements for the major include the following: LLRO 33000

"Exploring International Economics" (one credit, preferably taken in the sophomore year), which fosters an integrated approach to the study of culture and economics; six courses (18 credits) from Russian departmental offerings beyond the three-semester language requirement, including RU 20102 "Intermediate Russian II," RU 40101 "Advanced Russian I," RU 40102 "Advanced Russian II," one literature/culture elective each at the 30000 or 40000 levels, and one additional literature/culture elective or one Russian history elective at the 30000 or 40000 level; and eight courses in economics. In addition, all international economics majors combine their study of economics and language, literature, and culture in a senior capstone research paper/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 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30331; and two of the following: ECON 40700, ECON 40800, ECON 40710 and ECON 40720.

### The Minor in Russian

The Russian minor consists of five courses (fifteen credits) at the 20000 level or above taught by departmental faculty. Course selection must include at least two language courses at the student's appropriate level and three additional three-credit courses at either the 30000 or the 40000 level.

### The Supplementary Major in Russian and East European Studies

Supplementary majors in Russian and East European Studies must have (1) three semesters (or the equivalent) of college-level Russian or another approved East European language (this requirement may be satisfied, in whole or in part, through participation in approved summer language institutes when necessary); (2) five additional courses (15 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame across at least three departments (at most one of these courses may be a language course at the fourth-semester level or above; the counting of a language course is allowed only for a student who is not completing a major or minor in Russian); (3) three 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies; and EITHER (4) a substantial senior thesis directed by a member of the Russian and East European Studies faculty (students will receive 3 credits in the fall semester for preparation of the thesis and 3 credits in the spring semester for writing the thesis) OR (5) a sixth 3-credit course in Russian and East European area

studies at the 30000 or 40000 level in any discipline (an additional advanced-level language course may satisfy this requirement only for a student not completing a major or minor in Russian) plus a one-semester senior seminar with a focus on a Russian and East European Studies topic, culminating in a senior essay. (Note: at present such seminars are offered only in the history department to history majors only; REES students not majoring in history may contact the professor for permission to enter such a course.)

### The Minor in Russian and East European Studies (Russian Majors' Track)

This minor option is available to students making good progress toward completion of a full or supplementary major in Russian. The minor requires (1) four courses (12 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame (no more than one of the four courses may be chosen from Russian departmental offerings; language courses, including RU 40101/40102, will not satisfy this requirement); and (2) two 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies.

### The Minor in Russian and East European Studies (History Majors' Track)

This minor option is available to students making good progress toward completion of a history major, with a concentration in Russian and East European history consisting of at least three approved courses on topics in Russian and East European history. The minor requires (1) two semesters of college-level Russian or another approved East European language (language courses satisfying this requirement may not be double-counted between a college language requirement and the REES minor); (2) two courses (6 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame from offerings outside the history department; and (3) two 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies.

### The Minor in Russian and East European Studies (Open Track)

This minor option is open to students completing any major. The open-track minor requires (1) five courses (15 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame and distributed across at least three departments. Up to two semesters of college-level Russian or another approved East

## HISTORY

European language may be counted as part of this requirement (however, language courses may not be double-counted between a college language requirement and the REES minor); and (2) three 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European studies course taught in any discipline, a research apprenticeship in political science on a Russian and East European studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European studies.

**Study Abroad**

Our students are encouraged to experience firsthand the excitement of being immersed in Russian culture through participation in a study program in Russia. Programs are available during the summer (five to ten weeks) or for an entire semester or academic year. Credits earned for course work taken in approved programs may be applied toward the Russian major or minor at Notre Dame. Grants are available on a competitive basis for summer language study through the Center for the Study of Languages and Cultures and the Nanovic Institute for European Studies.

**Senior Thesis/Honors Track**

Russian majors are admitted into the honors track by application. To receive honors, a student must (1) complete all requirements for the major; (2) maintain a GPA of at least 3.5 in the major; (3) register for two 1-credit enrichment courses (RU 47100) in the senior year; (4) register for two 40000-level literature courses in the senior year; and (5) receive a grade of A- or higher for a substantial honors thesis written in English. Closely supervised by one of the Russian faculty in the Department of German and Russian Languages and Literatures, the Russian honors thesis is to be the product of a 6-credit honors track directed readings course taken in the senior year. The student will receive 3 credits in the fall semester for preparation of the thesis and 3 credits in the spring semester for writing the thesis. For more information, see [germanandrussian.nd.edu](http://germanandrussian.nd.edu).

**Placement and Language Requirement**

At the beginning of each semester, placement tests in German and Russian will be administered that will allow students either to test out of one or two semesters of the language requirement or enroll in a course commensurate with their language proficiency. The placement test is mandatory for students who had German or Russian in high school.

Students testing out of three semesters must complete an additional course at the 20xxx level or higher before testing out of the language requirement. This includes students who have taken an AP or SAT II exam.

**COURSE DESCRIPTIONS**

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes in German or Russian for a given semester may be found by clicking on “Class Search” and selecting either German or Russian from the Subject menu. The scheduled classes in Russian and East European Studies for a given semester may be found by clicking on “Class Search” and selecting REES from the Attribute menu. Course descriptions can be found by clicking on the subject code and course number in the search results.**

**History***Chair:*

Patrick Griffin

*Director of Graduate Studies:*

Ted Beatty

*Director of Undergraduate Studies:*

Daniel A. Graff

*Ignatius A. O’Shaughnessy Dean of the College of Arts and Letters:*

John T. McGreevy

*Rev. John J.avanaugh, C.S.C., Professor of Humanities:*

James Turner

*Francis A. McAnaney Professor of History:*

Mark Noll

*Andrew V. Tackes Professor of History:*

John H. Van Engen

*Madden-Henneberry Professor of Irish American History:*

Patrick Griffin

*Dorothy S. Griffin Professor of History:*

Brad Gregory

*Robert M. Conway Director of the Medieval Institute:*

Olivia Remie Constable

*John M. Regan Jr. Director of the Joan B. Kroc Institute for International Peace Studies:*

R. Scott Appleby

*Professors:*

R. Scott Appleby; Jon Coleman; Olivia Remie Constable; Felipe Fernandez-Armesto; Brad Gregory; Patrick Griffin; Christopher S. Hamlin; Thomas A. Kselman; Semion Lyandres; John T. McGreevy; Rev. Wilson D. Miscamble, C.S.C.; Dian H. Murray; Thomas Noble; Mark Noll; James Smyth; Rev. Robert Sullivan; James Turner; John H. Van Engen

*Professors Emeritus:*

Rev. Thomas Blantz, C.S.C.; Jay P. Dolan; J. Philip Gleason; Rev. Robert L. Kerby; George Marsden; Walter Nugent; Rev. Marvin R. O’Connell; Andrzej Walicki

*Associate Professors:*

Ted Beatty; Gail Bederman; Karen Graubart; Daniel Hobbins; Asher Kaufman; Alexander Martin; Margaret Meserve; Richard Pierce; Linda Przybyszewski; Julia Adeney Thomas

*Assistant Professors:*

Mike Amezcua; Catherine Cangany; John Deak; Lauren Faulkner; Rebecca McKenna; Paul Ocobock; Jaime Pensado; Rory Rapple; Deborah Tor

*Professional Specialist:*

Daniel A. Graff

*Concurrent Faculty:*

Francesca Bologna (Program of Liberal Studies); D’Arcy Jonathan Boulton (Medieval Institute); Keith R. Bradley (Classics); Steven Brady (First Year of Studies); Kathleen Sprows Cummings (American Studies and Cushwa Center); Barry Cushman (Law School); Erika Doss (American Studies); Melinda Gormley (John J. Reilly Center); Robert Goulding

## IRISH LANGUAGE AND LITERATURE

(Program of Liberal Studies); Lionel Jensen (East Asian Languages & Cultures); Robert (Jay) Malone (History of Science Society); Phillip Sloan (Program of Liberal Studies); Thomas A. Stapleford (History and Philosophy of Science); Kevin Whelan (Keough Institute for Irish Studies); Sophie White (American Studies)

*Visiting Faculty:*

John Soares

**Program of Studies.**

The Department of History offers courses for undergraduates designed to expose them to life in the past as it was experienced and understood in the Americas, Europe, Asia, Africa, and Australia. Courses offered consist of lectures and seminars that require students to develop both a critical appreciation of primary and secondary texts and skills in historical thinking and writing.

For students interested in pursuing a history major, the department offers a rigorous program consisting of ten 3-credit courses. The sequence begins with an exciting introductory seminar (HIST 33000—History Workshop), which plunges students into the work of writing history from the moment they join the major through intensive interpretation of primary source documents. To encourage breadth of historical knowledge, standard majors also take a variety of courses emphasizing different chronological periods and geographical areas. More specifically, they must take one course from four of six primary fields: Africa/Asia/Middle East; Ancient/Medieval Europe (to 1500); Modern Europe (from 1500); United States; Latin America; Special (for courses focusing on other geographical areas or courses primarily comparative or global in approach). In addition, to encourage depth in a particular field of interest, standard majors also declare a concentration consisting of three courses. (These concentrations must be approved by the major's advisor by the beginning of the senior year.) Standard majors also take an elective in any field they choose. To complete their course work, standard majors take a departmental seminar (HIST 43xxx), which offers the opportunity to conduct primary research and produce a substantial paper.

Majors above may count up to two lower-level courses toward the major program (courses beginning with a 1 or a 2). All others must be "major-level" courses that begin with a 3 or higher. These lower-level courses may be counted toward breadth requirements, electives, or concentration area courses.

Majors must take at least one *writing-intensive course* in the form of the departmental seminar (HIST 43xxx). In addition to prioritizing research in primary sources, these courses also emphasize writing as a process, with students encouraged to perform continual revisions and share their writing with their peers.

**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) each semester of the senior year.

**Phi Theta Alpha.** Students who have completed at least four major-level courses in history, earning a grade point average of 3.5 or above, and whose cumulative grade point average is at least 3.2, 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.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *History*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## Irish Language and Literature

The only one of its kind in North America, the Department of Irish Language and Literature began offering a major and a supplemental major in Irish Language and Literature in the fall 2012 semester. The department also gives undergraduates the opportunity to complete a minor in the field. These programs teach students Irish, the indigenous language of Ireland and the voice of the oldest vernacular literature in Europe. It also allows them to engage Irish culture in its native language.

Officially launched on October 1, 2004, by His Excellency Noel Fahey, Irish Ambassador to the United States of America, the Department of Irish Language and Literature recognizes Notre Dame's commitment to the Irish language and the centrality of Irish to the academic discipline of Irish Studies.

**Requirements for a Major in Irish Language and Literature (with a language-intensive concentration)** In addition to Intermediate Irish I, a student must take

- Intermediate Irish II
- Advanced Irish I & II
- 2 survey courses—one covering Irish language and one covering Irish language literature
- 4 electives taken at a 30000/40000 level
- 1 elective taken at a 40000 level and taught in the Irish language

**Supplemental Major (with a language-intensive concentration)** Requirements are the same as those for the major except only 2 elective courses at the 30000/40000 level are required.

**Requirements for a Major in Irish Language and Literature (with a literature-intensive concentration)** In addition to Intermediate Irish I, a student must take

- Intermediate Irish II
- 2 survey courses—one covering Irish language and one covering Irish language literature
- 7 electives taken at a 30000/40000 level

**Supplemental Major (with a literature-intensive concentration)** Requirements same as those for the major except only 5 elective courses at 30000/40000 level are required.

Students pursuing a **minor in Irish language and literature** are required to complete the following courses:

1. Take and pass the following Irish language courses: Beginning Irish I & II, Intermediate Irish and Advanced Readings in Irish Culture.
2. Take and pass three Irish literature courses offered by the Department of Irish Language and Literature, two of which must be a 300 level or above.

## MATHEMATICS

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Irish Language and Literature*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Mathematics***Chair:*

Misha Gekhtman

*Associate Chair:*

Juan Migliore

*Director of Graduate Studies:*

Julia Knight

*Director of Undergraduate Studies:*

Matthew Dyer

*Charles L. Huisiking Professor of Mathematics:*

Julia F. Knight

*John and Margaret McAndrews Professor of Mathematics:*

Francois Ledrappier

*John A. Zahm, C.S.C., Professor of Mathematics:*

Stephen A. Stolz

*Rev. Howard J. Kenna, C.S.C., Professor of Mathematics:*

Karsten Grove

*Professors:*

Peter A. Cholak; Francis X. Connolly; Jeffrey A. Diller; William G. Dwyer (emeritus); Leonid Faybusovich; Michael Gekhtman; Matthew Gursky; Alexander J. Hahn; Brian C. Hall; Qing Han; Alex A. Himonas; Alan Howard (emeritus); Xiabo Liu; Juan Migliore; Gerard K. Misiolek; Liviu Nicolaescu; Timothy O'Meara (Kenna Professor of Mathematics, emeritus, and provost emeritus); Richard R. Otter (emeritus); Claudia Polini; Barth Pollak (emeritus); Mei-Chi Shaw; Brian Smyth; Dennis M. Snow; Nancy K. Stanton; Sergei Starchenko; Laurence R. Taylor; E. Bruce Williams; Warren J. Wong (emeritus); Frederico Xavier

*Associate Professors:*

Katrina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Matthew J. Dyer; Samuel R. Evens; Abraham Goetz (emeritus); Richard Hind; Vladeta Vuckovic (emeritus)

*Assistant Professors:*

Nero Budur; David Galvin

*Associate Special Professional Faculty:*

Arthur Lim

*Assistant Special Professional Faculty:*

Annette Pilkington

**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
History or Social Science	3
MATH 10850. Honors Calculus I	4
Natural Science	3
Language: (French, German or Russian recommended)	3
Physical Education	—
	16

*Second Semester*

Language: French, German or Russian	3
University Seminar	3
MATH 10860. Honors Calculus II	4
Natural Science	3
Electives	3
Physical Education	—
	16

**Sophomore Year***First Semester*

Core Course	3
Language: French, German or Russian	3
Fine Arts Elective	3
MATH 20810. Honors Algebra I	3
MATH 20850. Honors Calculus III	4
	16

*Second Semester*

Introduction to Philosophy	3
Core Course	3
Theology	3
MATH 20820. Honors Algebra II	3
MATH 20860. Honors Calculus IV	4
	16

**Junior Year***First Semester*

Theology	3
MATH 30810. Honors Algebra III	3
MATH 30850. Honors Analysis I	3
Elective	5
History or Social Science	3
	17

## MIEVEAL STUDIES

<i>Second Semester</i>	
Philosophy	3
MATH 30820. Honors Algebra IV	3
MATH 30860. Honors Analysis II	3
English/American Literature	3
Elective	3
	15
<b>Senior Year</b>	
<i>First Semester</i>	
Mathematics Electives	6
Electives	9
	15
<i>Second Semester</i>	
Mathematics Electives	6
Electives	9
	15

(At least six credits of mathematics electives must be at the 40xxx level.)

### The Senior Thesis for Mathematics Majors

Students in the mathematics program have the option of writing a thesis on a subject in mathematics, or in an interdisciplinary area connected to mathematics. Such a thesis is strongly encouraged for math honors students and required of students in the SUMR program. This project is intended to give the student a better sense of how mathematics is done and used, and to develop in the student the habit of learning mathematics and its applications in an independent setting. In most cases, this work would be expected to be expository, but based on advanced-level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject, or to explore one of the many interesting connections that mathematics has with other disciplines.

During the second semester of the junior year and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis, receiving 1 credit for each of these two semesters of work, under MATH 48800.

The thesis is to be crafted during the second semester of the senior year. The thesis must be submitted to the director of undergraduate studies by April 15 of the senior year. If the thesis is approved, the student will receive 1 credit under MATH 48900 and the citation of "Graduation with Senior Thesis" will appear on the transcript.

Students interested in writing a senior thesis should contact the director of undergraduate studies in the Department of Mathematics.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Mathematics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## Medieval Studies

*Robert M. Conway* Director of the Medieval Institute:  
Olivia Remie Constable (History)

*Director of Undergraduate Studies:*  
Linda Major

*Fellows of the Medieval Institute:*  
Christopher Abram (English); Rev. Joseph P. Amar (Classics: Arabic); Ann Astell (Theology); Yury Avvakumov (Theology); Zygmunt G. Baranski (Romance Languages: Italian); Alexander Blachly (Music); W. Martin Bloomer (Classics: Latin); D'Arcy Jonathan Dacre Boulton (History); Maureen B. McCann Boulton (Romance Languages: French); Keith R. Bradley (Classics: Latin; History); Theodore J. Cachey (Romance Languages: Italian); John C. Cavadini (Theology); Robert R. Coleman (Art History); Richard Cross (Philosophy); Rev. Brian E. Daley, S.J. (Theology); JoAnn DellaNeva (Romance Languages: French); Rev. Michael S. Driscoll (Theology); Stephen D. Dumont (Philosophy); Kent Emery, Jr. (Liberal Studies; Philosophy); Margot Fassler (Music, Theology); Felipe Fernández-Armesto (History); Alfred Freddoso (Philosophy); Dolores Warwick Frese (English); Stephen E. Gersh (Philosophy); Bernd Goehring (Liberal Studies); Robert Goulding (History and Philosophy of Science); Karen Graubart (History); Brad S. Gregory (History); Li Guo (Classics: Arabic); Daniel Hobbins (History); Peter Holland (Theater); Tala Jajour (Music); Peter Jeffery (Music); Rev. John I. Jenkins, C.S.C. (Philosophy); Claire Taylor Jones (German); Danielle Joyner (Art History); Encarnación Juárez-Almendros (Romance Languages: Spanish); Kathryn Kerby-Fulton (English); Mary M. Keys (Political Science); Brian Krostenko (Classics: Latin); Ian Kuijt (Anthropology); Blake Leyerle (Theology); Tim Machan (English); Julia Marvin (Liberal Studies); Peter McQuillan (Irish Language and Literature); Margaret Meserve (History); Christian R. Moevs (Romance Languages: Italian); Vittorio Montemaggi (Romance Languages: Italian); Candida R. Moss (Theology); Hildegund Müller (Classics: Latin); Thomas F.X. Noble (History); David O'Connor (Philosophy; Classics); Mark C. Pilkinton (Theatre); Jean Porter (Theology); Rory Rapple (History); Gretchen Reydams-Schils (Liberal Studies; Philosophy); Gabriel Said Reynolds (Theology); Denis Robichaud (Liberal Studies); Dayle Seidenspinner-Núñez (Romance Languages: Spanish); Susan Guise Sheridan (Anthropology); Deborah Tor (History); John Van Engen (History); Joseph P. Wawrykow (Theology); ; Robin Darling Young (Theology)

## Music

**Program of Studies.** The Medieval Institute is one of Notre Dame's oldest and most renowned centers of learning. Established in 1946, it was envisaged from the start to be a premier locus for the study of the European Middle Ages. Over the decades its scope has broadened to where it now includes Islamic, Jewish, Eastern, and Western Christian studies. The academic strength and stature of the institute are due not only to its faculty, students, and library, but also to its ongoing commitment to the original liberal arts ideal.

Medieval Studies prepares students to enter graduate school, law school, medical school, or various careers such as business, government, education, publishing, ministry, curatorship, and research. With an emphasis on close reading, precise textual analysis, careful writing, and vigorous discussion, the program is designed to foster critical thinking, oral and written communication skills, and a heightened appreciation for history, religion, and culture.

Far from being the "dark ages," medieval civilization witnessed the dawn of many of today's institutions including universities, hospitals, legal and economic systems, religious communities and doctrine, architecture, engineering, science, art, and literature. Contemporary society is indebted to the Middle Ages not only for its inheritance, but also for its relevance.

The Medieval Studies program offers four undergraduate tracks, each based on an interdisciplinary model. It draws courses from Anthropology; Art, Art History, and Design; Classics; English; German and Russian Languages and Literatures; History; Irish Language and Literature; Music; Philosophy; Political Science; Romance Languages and Literatures; and Theology. From these 12 disciplines, students are encouraged to build a unique program of study, in consultation with a faculty advisor, around an area of concentration that captures an interest, prepares for a field, or contributes to an academic pursuit.

Students interested in Medieval Studies may elect one of the following four options:

1. Major in Medieval Studies
2. Honors Major in Medieval Studies
3. Supplementary Major in Medieval Studies
4. Minor in Medieval Studies

All three major tracks include two common components. Each student's curriculum is built around a concentration chosen by the individual (from the 12 participating departments), in conjunction with a faculty advisor. The concentration requires a minimum of four interrelated courses reflecting an intellectual and curricular coherence. An advanced seminar (3 credits) is the second common element in each of the major tracks. Students in the seminar are expected to read widely and discuss vigorously a set of sources that present a particular issue from several points of view. In addition, they are also expected to write a substantial research paper. The

goal of the seminar is to engage students in thinking critically and knowledgeably across the boundaries of traditional disciplines while maintaining a focus on a particular time, place, or issue.

The three major tracks and the minor track also have an introductory required course (3 credits), MI 20001, *The World of the Middle Ages*.

Following are brief outlines of the basic requirements for the three major tracks and the minor track. Further details can be obtained from the director of undergraduate studies in the Medieval Institute.

#### Medieval Studies Major (30 credits)

- The World of the Middle Ages course
- Four courses drawn from two or more departments representing a concentration
- Four electives in Medieval Studies drawn from at least two departments
- One advanced seminar (4xxx-level or above) in Medieval Studies

#### Medieval Studies Honors Major (36 credits)

- Same requirements as major in Medieval Studies (see above)
- EXCEPT one intermediate Latin course and one advanced Latin course are required in lieu of two medieval electives
- PLUS an honors thesis for 6 credits

#### Medieval Studies Supp. Major (24 credits)

- The World of the Middle Ages course
- Four courses drawn from two or more departments representing a concentration
- Two or three electives in Medieval Studies
- Medieval Studies seminar (on a space-available basis and in conjunction with MI electives option)

#### Medieval Studies Minor (15 credits)

- The World of the Middle Ages course
- Three or four electives in Medieval Studies drawn from at least two departments
- Medieval Studies seminar (on a space-available basis and in conjunction with MI electives option)

### COURSE DESCRIPTIONS

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Medieval Institute*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

## Music

#### Chair:

Peter H. Smith  
*Keough-Hesburgh Professor of Music History and Liturgy:*

Margot Fassler  
*Michael P. Grace Chair in Medieval Studies:*

Peter Jeffery  
*J.W. Van Gorkom Professor of Music:*

Susan L. Youens  
*Professors:*  
Alexander Blachly; Calvin M. Bower (emeritus); William Cerny (emeritus); Craig J. Cramer; Kenneth W. Dye; Ethan T. Haimo (emeritus); Georgine Resick; Carmen Tellez

*Associate Professors:*  
John Blacklow; Karen L. Buranskas; Mary E. Frandsen; Paul G. Johnson; Rev. Patrick Maloney, C.S.C. (emeritus); Carolyn R. Plummer (emeritus)

*Assistant Professors:*  
Tala Jarjour; André Redwood  
*Professional Specialist*

Mark Beudert  
*Associate Professional Specialists:*  
Lawrence H. Dwyer; Daniel C. Stowe

*Assistant Professional Specialists:*  
Stephen Lancaster; Tricia Park  
*Artist in Residence in Piano:*

Daniel Schlosberg  
*Adjunct Faculty:*  
John Apeitos; Darlene Catello; Darrel Tidaback

*Band Staff:*  
Justin McManus; Matthew Merten; Sam Sanchez; Alison Redar

**Program of Studies.** The Department of Music offers students a variety of musical experiences in accordance with its two objectives: (1) to provide all students, regardless of their major, knowledge and training in music through introductory, historical and theoretical courses, through participation in large and small ensembles, and through applied instrumental or vocal study; and (2) to provide intensive curriculum and training for the student who chooses music as a major. Students majoring in music will choose a concentration in Theory and History or in Performance. Each concentration offers an honors option for students intending to pursue professional study in the field after graduation. These students should also continue to study at least one non-native language beyond the college's language requirement. All the concentrations have requirements beyond the course work. These may include recitals, ensembles, juries, and so forth.

Students considering these programs should contact the department as early as possible, preferably in the first year of study. This is especially important if study abroad is anticipated.

**Advising.** Each major will be assigned a faculty advisor who must be consulted in person to discuss

## Music

the program of study before a student may register for classes.

**Lessons.** Music majors in the Performance concentration qualify for a 100 percent discount on weekly one-hour applied music lessons on their primary instrument and a 50 percent discount on a secondary instrument. Students in the Theory and History concentration qualify for a 50 percent discount on lessons on a primary instrument and no discount for lessons on a secondary instrument. Applied music lessons are also available for non-majors for a fee. Lessons may count as “activity” elective credits. (The College of Arts and Letters accepts up to three activity credits toward graduation.) The fee is charged to the students’ accounts, and no refunds are made after the second lesson.

**Interdisciplinary Minor in Liturgical Music.** This 18-credit minor consists of three 3-credit courses in theology and two 3-credit courses in music, plus three credits of music lessons or approved ensembles, to be selected in consultation with the student’s music advisor. Contact the director of undergraduate studies in the Department of Theology.

**Master of Sacred Music degree.** The Master of Sacred Music (MSM) is a degree program situated in the Department of Theology at the University of Notre Dame with major participation from faculty in the Department of Music. For information, contact Janet Rudasics at (574) 631-5349.

**Doctor of Musical Arts degree.** The Doctor of Musical Arts (DMA) is a degree program situated in the College of Arts and Letters at the University of Notre Dame with major participation from faculty in the Departments of Music and Theology. For more information, contact Janet Rudasics at (574) 631-5349.

### HISTORY/THEORY

The requirements for a 33-credit major with a concentration in theory and history are:

Class	Credits
Harmony and Voice Leading (Theory I) (Prerequisite course; 3 credits count as University elective)	0
Advanced Harmony and Voice Leading (Theory II)	3
Chromatic Harmony (Theory III)	3
Twentieth-Century Music: Structure and Style (Theory/History IV)	3
Musicianship I–III	3
History I–III	9
Four 3-credit courses in history and theory, 30xxx level and above	12
Music Total	33

Collegiate/University Requirements and Electives	87
Total	120
Honors in Music (optional)	6
(One additional 3-credit course in music history or theory, 30xxx-level or above, and a senior project, to be determined with advisor)	

Students who have had previous music education may place out of Harmony and Voice Leading (Theory I) and Musicianship Labs, by examination.

Students with a music GPA of 3.7 or higher may be invited to participate in the honors program at the end of their sophomore year.

Applied lessons and ensembles are encouraged, but not required. Students intending to continue the study of music after graduation should maintain a rigorous program of lessons and applied music.

### PERFORMANCE

Students who wish to major in performance must have had a minimum of four years of instruction on their instrument prior to their enrollment at Notre Dame.

The requirements for a 42-credit major with a concentration in performance are:

Class	Credits
Harmony and Voice Leading (Theory I) (Prerequisite course; 3 credits count as University elective)	0
Musicianship I (prerequisite course)	0
Advanced Harmony and Voice Leading (Theory II)	3
Chromatic Harmony (Theory III)	3
Twentieth-Century Music: Structure and Style (Theory/History IV)	3
History I–III	9
Two MUS 30xxx-level or above courses in music theory or history that carry 3 credits each	6
Three additional elective credits in music	3
Advanced Performance Studio (1 credit per semester for the first year; 2 credits for the six semesters thereafter)	14
1 recital	1
Total Music	42
Collegiate/University Requirements and Electives	78
Total	120
Honors in Music (optional)	6
(Additional electives at the 30xxx-level or higher and/or applied music study (5 credits total) and an additional recital (1 credit).)	

Students with a music GPA of 3.7 or higher may be invited to participate in the honors program at the end of their sophomore year.

In order to remain in the performance program, students must be approved by faculty. In the spring semester of the freshman, sophomore, and junior years, all performance majors must participate in juries. Afterwards, the faculty will assess the level of their performance to determine if they are qualified to continue in the program. Students who demonstrate a high level of achievement in the sophomore juries will be candidates for the honors program.

Students in the performance concentrate may take proficiency exams to pass out of one or more of the musicianship courses; however, if they do not pass the proficiencies, they must enroll in Musicianship I–III.

Performance concentrators must present a senior recital. (Honors majors must present an additional recital.)

Participation in ensembles (e.g., chamber music class, large ensembles, chorale, opera, etc.) is required each semester. (No credit toward the major, but may be applied toward graduation as “activity” credits.)

Students who have had previous music education may place out of Harmony and Voice Leading (Theory I), by examination.

### COURSE DESCRIPTIONS

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



## PHILOSOPHY

## Philosophy

### Chair:

Richard Cross

*F.J. and H.M. O'Neill Professor of Science, Technology and Values:*

Kristin Shrader-Frechette

*Rev. Theodore M. Hesburgh Professor Emeritus of Arts and Letters:*

Rev. David Burrell, C.S.C. (emeritus)

*McMahon/Hank Professor of Philosophy:*

Karl Ameriks; Michael Detlefsen

*Notre Dame Professor of Philosophy:*

Gary Gutting

*Rev. John A. O'Brien Professor of Philosophy:*

Robert Audi; Richard Cross; Alvin Plantinga (emeritus)

*John Cardinal O'Hara Professor of Philosophy:*

Peter Van Inwagen

*George N. Shuster Professor Emeritus of Philosophy:*

Michael J. Loux (emeritus)

*Rev. John A. O'Brien Senior Research Professor (Emeritus):*

Alasdair C. MacIntyre (emeritus)

*John and Jean Oesterle Professor of Thomistic Studies:*

Alfred Freddoso

*Glynn Family Honors II Professor of Philosophy:*

Paul Weithman

### Professors:

Patricia Blanchette; Anjan Chakravarty; Fred Dallmayr (emeritus); Cornelius F. Delaney; Michael R. DePaul; Stephen Dumont; John Finnis (concurrent); Thomas P. Flint; Stephen Gersh (concurrent); Vittorio Hösle (concurrent); Don A. Howard; Rev. John I. Jenkins, C.S.C.; Lynn Joy; Edward Manier (emeritus); Robert Norton (concurrent); Michael Rea; Mark Roche (concurrent); Kenneth Sayre; James P. Sterba; Ted A. Warfield; Stephen H. Watson

### Associate Professors:

Timothy Bays; Katherine Brading; Sheilah Brennan (emerita); Curtis Franks; Sean Kelsey; Janet A. Kourany; Vaughn R. McKim (emeritus); G. Felicitus Munzel (concurrent); Samuel Newlands; John O'Callaghan; David O'Connor; Gretchen Reydams-Schils (concurrent); Jeffrey Speaks; Fred Rush; David Solomon; Leopold Stubenberg

### Assistant Professors:

Joseph Karbowski; Grant Ramsey; Blake Roeber; Meghan Sullivan

### Professional Specialists:

Montey G. Holloway

**Program of Studies.** There are two ways to major in philosophy: **Regular philosophy majors** are required to take eight courses in philosophy beyond the general two-course University requirement. Three specific courses must be included among the eight: a two-semester sequence of courses in the history of philosophy, Ancient and Medieval Philosophy (PHIL 30301) and Modern Philosophy (PHIL 30302), and a course in formal logic (PHIL 30313 or, for qualified students, PHIL 43907. The logic

requirement can also be fulfilled by MATH 10130, though this course does not count toward the eight courses required for the major). In addition, regular majors must take at least two courses at the 40xxx level and three electives at either the 30xxx level or 40xxx level.

**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, students must normally maintain a GPA of 3.5 or above in the majors courses. Students considering the senior thesis are strongly encouraged to have completed two of the three core courses (the two history surveys and logic) AND three 40000-level seminars by the end of the junior year.

**Students majoring in other departments may take a minor in philosophy by completing the following in addition to the two-course University requirement in Philosophy.** The sequence in the history of PHIL 30301 Ancient and Medieval Philosophy and 30302 Modern Philosophy; one course at the 30000 level or 40000 level; one course at the 40000 level.

All 40xxx-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:

PHIL 10101 or 20101, and 20xxx-level course (University-required courses; a higher-level course may be substituted for the latter).

PHIL 30301 and 30302. History of Philosophy I and II.

PHIL 30313. Formal Logic.

### Requirements in Theology:

THEO 10001, 10002, 10003 or 13183 (Foundations) and a 20xxx (development level) course (University-required courses).

THEO 40201 and 40202. Christian Traditions I and II.

THEO 40101 or 40108. Upper-division scripture course.

## POLITICAL SCIENCE

**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).

**COURSE DESCRIPTIONS**

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

**Political Science***Chair:*

Michael Desch

*Director of Graduate Studies:*

Geoffrey Layman

*Director of Undergraduate Studies:*

Joshua B. Kaplan

*Helen Conley Professor of Political Science:*

Scott Mainwaring

*Packey J. Dee Professor Emeritus of Political Science*

Fred R. Dallmayr

*Packey J. Dee Professor of Political Science*

Dana Villa

*Nancy Reeves Dreux Professor of Political Science:*

Catherine H. Zuckert

*Nancy Reeves Dreux Professor of Political Science:*

Michael P. Zuckert

*Joseph and Elizabeth Robbie Emeritus Professor of Political Science:*

Donald P. Kommers

*William M. Scholl Professor of International Affairs:*

A. James McAdams

*The Rev. Theodore M. Hesburgh, C.S.C., Professor of Peace Studies:*

George A. Lopez

*David A. Potenziani Memorial Associate Professor of Constitutional Studies:*

Patrick Deneen

*Professors:*

Ruth Abbey (on leave 2013–14); Peri E. Arnold (on leave fall 2013); Sotirios A. Barber; George A. Brinkley (emeritus); David E. Campbell; Michael Coppedge; Fred R. Dallmayr (emeritus); Darren Davis; Michael Desch; Alan K. Dowty (emeritus); Amitava Dutt; Michael J. Francis (emeritus); Gary Goertz; Vittorio G. Hösle (concurrent); Robert Johansen (emeritus); Geoffrey Layman; David C. Leege (emeritus); Gilbert D. Loescher (emeritus); Peter R. Moody Jr. (emeritus); Daniel Philpott; Dianne Pinderhughes; Benjamin Radcliff (on leave spring 2014); Patrick Regan; L. John Roos (emeritus); Rev. Timothy R. Scully, C.S.C.; A. Peter Walshe (emeritus)

*Associate Professors:*

Eileen Hunt Botting; Susan D. Collins (on leave spring 2014); Tanisha Fazal; Andrew C. Gould; Victoria Hui; Debra Javeline (on leave spring 2014); Mary Keys; Daniel A. Lindley III; Vincent P. Munoz (on leave spring 2014); Monika Nalepa (on leave fall 2013); David Nickerson; Ricardo Ramirez; Sebastian Rosato; Guillermo Trejo (on leave fall 2013); Christina Wolbrecht

*Assistant Professors:*

Jamie Bleck; Rev. Robert Dowd, C.S.C.; Alexandra Guisinger; Matthew Hall; Theodore B. Ivanus (emeritus); Rev. Sean McGraw, C.S.C.; Emilia Powell; Ernesto Verdeja; Sarah Zuckerman-Daly

*Associate Professional Specialists:*

Carolina Arroyo; Joshua B. Kaplan; Rev. William Lies, C.S.C. (concurrent); Luc Reydams

*Assistant Professional Specialists:*

Matthew Doppke (concurrent); Susan Rosato

**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 10 courses:

- four breadth requirements, consisting of a course in each of the four fields of political science: American politics, international relations, comparative politics, and political theory. Two of these must be introductory courses. The other two can be introductory courses or intermediate-level courses.
- four intermediate-level courses: students may specialize in one field or take courses in a combination of fields that suits their interests.
- two seminars.

**Senior Thesis.** Students with a grade point average of 3.5 or above are encouraged to write a senior thesis. This two-semester project involves working closely with a faculty supervisor, and offers the opportunity to explore more deeply and independently a research project of the student's choice.

**Pi Sigma Alpha.** Students who have taken a minimum of four political science courses, with a grade no lower than a B in their political science courses, and who are on 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 will:

1. take a cluster of four recommended enrichment courses in consultation with their advisor, including:
  - a) a dedicated methodology course such as Research Design, Quantitative Political Analysis, or How to Do Political Research;

## PROGRAM OF LIBERAL STUDIES

- b) Principles of Microeconomics and Principles of Macroeconomics. A student would need a compelling reason to offer a substitute for one of these two;
- c) an upper-level course related to the student's senior thesis, such as a graduate course in political science, language proficiency beyond level 3, or another course in the department or in another department chosen in conjunction with the student's advisor.
2. complete a senior thesis with a grade of B+ or higher;
3. graduate with a cumulative grade point average of 3.55 or higher. This number is subject to change from year to year.

For example:

A student primarily interested in American politics or international relations might take 1) Quantitative Political Analysis, Research Design; 2) Principles of Microeconomics; 3) Principles of Macroeconomics; and 4) a graduate political science course or an upper-level history course related to their senior thesis.

A student interested in comparative politics might take 1) Quantitative Political Analysis, Research Design; 2) Principles of Microeconomics; 3) Principles of Macroeconomics; and 4) a graduate course in political science or an upper-level history, sociology, or anthropology course related to their senior thesis, language proficiency above level 3, or a second language.

A student interested in political theory might take 1) Research Design; 2) Principles of Microeconomics; 3) a graduate course in political theory, language proficiency above level 3 or a second language; and 4) an upper-level philosophy or literature course related to their senior thesis.

The key to doing the honors track is meeting with a department advisor each semester to discuss a more careful selection of courses within the major and a better use of electives outside the major that will both complement and supplement your political science courses. The selection of recommended courses will depend in part on your own interests and career goals, so it is important to discuss these with your advisor.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- *Constitutional Studies*
- *Political Science*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## Program of Liberal Studies

### Chair:

Gretchen Reydams-Schils

*Rev. John J. Cavanaugh, C.S.C., Professors of Humanities:*

Stephen M. Fallon; Michael J. Crowe (emeritus);

### Professors:

Rev. Nicholas Ayo, C.S.C. (emeritus); Kent

Emery Jr.; Walter J. Nicgorski (emeritus);

F. Clark Power; Gretchen Reydams-Schils; Phillip

R. Sloan (emeritus); M. Katherine Tillman

(emeritus); Henry M. Weinfield

### Associate Professors:

Francesca Bordogna; Robert Goulding;

Julia Marvin; G. Felicitas Munzel; Pierpaolo

Polzonetti; Thomas Stapleford

### Assistant Professors:

Christopher Chowrimootoo; Bernd Goehring;

Denis Robichaud

**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. Students enter the Program at the end of the First Year of Studies.

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 are required 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 international study 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 (215 O'Shaughnessy) and website ([pls.nd.edu](http://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
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	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
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	16

#### Junior Year

##### First Semester

30301. Ethics	3
30411. Scientific Inquiry: Theories and Practices	3
30501. Music as a Liberal Art	3
33101. Great Books Seminar III	4
Elective	3
	<hr/>
	16

## PSYCHOLOGY

*Second Semester*

30202. Literature II: Shakespeare and Milton	3
30302. Political and Constitutional Theory: Ancient and Modern	3
33102. Great Books Seminar IV	4
Elective	3
Elective	3
	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	2
Elective	3
	15

*Second Semester*

40302. Metaphysics and Epistemology	3
40412. Science, Society, and the Human Person	3
43102. Great Books Seminar VI	4
48702. Essay Tutorial	3
Elective	3
	16

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Program of Liberal Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Psychology***Chair:*

Daniel Lapsley

*Director of Graduate Studies:*

David Watson

*Director of Undergraduate Studies:*

Anré Venter

*Andrew J. McKenna Professor of Psychology:*

David Watson

*Matthew A. Fitzsimons Professor of Psychology:*

Scott E. Maxwell

*Notre Dame Chair in Psychology:*

E. Mark Cummings

*Warren Foundation Professor of Psychology:*

Scott M. Monroe

*William J. and Dorothy K. O'Neill Professor of Psychology:*

Lee Anna Clark

*Professors:*

Cindy S. Bergeman; Julia M. Braungart-Rieker; Thomas Burish; Laura Carlson; Lee Anna Clark; E. Mark Cummings; Jeanne D. Day; George S. Howard; Anita E. Kelly; Daniel K. Lapsley; Scott E. Maxwell; Thomas W. Merluzzi; Scott M. Monroe; Darcia Fe Narvaez; Donald B. Pope-Davis; G.A. Radvansky; Anne Simons; David A. Smith; David Watson; Ke-Hai Yuan

*Associate Professors:*

James Brockmole; Charles R. Crowell; Kathleen Eberhard; Bradley S. Gibson; Dawn M. Gondoli; Gerald Haefel; Gitta Lubke; Nicole McNeil; Julianne C. Turner

*Associate Research Professor:*

Alexandra Corning

*Assistant Professors:*

Ying (Alison) Cheng; Joshua Diehl; Pascal Jean-Pierre; Jill Lany; Laura Miller; Jessica Payne; Kristin Valentino; Lijuan (Peggy) Wang; Michelle Wirth; Guangjian Zhang; Zhiyong (Johnny) Zhang

*Professional Specialists:*

Anré Venter; Mike Villano

**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.

**Undergraduate major.** The psychology major requires a minimum of seven three-credit courses, two four-credit courses (30100 and 30160) and one one-credit course (20010), and, therefore, a minimum of 30 credit hours.

The specific requirements comprising the minimum 30 credit hours are as follows. All majors are required to take three credits of PSY 10000, Introductory Psychology (for freshmen), or PSY 20000 or 20001, Introductory Psychology (for upper-class students) as a prerequisite for the content psychology courses. In addition, all psychology majors are required to take PSY 30100, Experimental Psychology I: Statistics (four credits), and PSY 30160, Experimental Psychology II: Research Methods (four credits). Majors then have a choice in that they are required to complete two of the following seven courses in the Social and Developmental Processes (CLASS A): PSY 30200, Developmental Psychology; PSY 30220, Adolescent Development; PSY 30600, Social Psychology; PSY 30300, Personality; PSY 30314, Introduction to Clinical Psychology; and PSY 30310, Abnormal Psychology; and PSY 30340, Cross-Cultural Psychology. Similarly, majors are required to complete two of the following nine courses in the Biological and Learning Processes (CLASS B): PSY 30500, Physiological Psychology; PSY 30550, Intro to Cognitive Neuroscience; PSY 30272, Neurodevelopmental Disorders; PSY 30501, Introduction to Biopsychology; PSY 30655, Cognitive Development; PSY 30430, Learning and Memory; PSY 30440, Sensation and Perception; PSY 30400, Cognitive Psychology; and PSY 30510, Behavioral Genetics. In their senior year each major must take two content courses at the 40xxx level, which are small, in-depth discussion-oriented seminars generally in the instructor's specific area of expertise. All 40xxx-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.) Finally, in the semester following their declaration of a major in psychology, new majors are expected to participate in a one-credit-hour seminar called PSY 20010, Psychology: Science, Practice, Policy, which provides an introduction to the department and the faculty.

**Note:** PSY 27800 Research Lab credits are strongly recommended for any students intent on pursuing a graduate career in psychology. In addition, even though Introductory Psychology (PSY 10000, PSY 20000, or PSY 20001) is a prerequisite for the content area courses, it does not fulfill any of the 30-credit-hour requirements for the major. In some cases students for whom psychology is their second major may complete another statistics course (BAMG 20100, ECON 30330, ACMS 20340, or BIOS 40411) in place of PSY 30100. However, these students will be required to complete an additional psychology course (PSY 30000 or PSY 40000) to complete the requisite number of psychology courses to graduate with the major.

### COURSE DESCRIPTIONS

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

## Romance Languages and Literatures

### Chair:

Thomas Anderson

### Director of Graduate Studies:

Alain Toumayan

### Assistant Chair and Director of Undergraduate Studies:

Shauna Williams

### Notre Dame Professor of Dante and Italian Studies:

Zygmunt G. Baranski

### Professors:

José Anadón; Thomas Anderson; Maureen Boulton; Theodore J. Cachey Jr.; JoAnn DellaNeva (Associate Dean, Arts and Letters); Julia V. Douthwaite; Carlos Jerez Farrán; María Rosa Olivera-Williams; Dayle Seidenspinner-Núñez; Alain Toumayan; John P. Welle

### Associate Professors:

Ben Heller; Carlos Jáuregui; Encarnacion Juárez-Almendros; Louis MacKenzie; Christian R. Moevs; Marisel Moreno; Catherine Perry; Alison Rice

### Assistant Professors:

Sabrina Ferri; Diana R. Jorza; Vittorio Montemaggi; Olivier Morel; Juan Vitulli; Sarah Wells

### Associate Professional Specialists and Concurrent

#### Lecturers:

Geraldine Ameriks; Alessia Blad; Tatiana Botero-Jáuregui; María Coloma; Marie-Christine Escoda-Risto; Monica Jancha; Giovanna Lenzi-Sandusky; Patrick I. Martin; Paul McDowell; Ivis Menes; Andrea Topash Ríos; Patrick Vivirito; Shauna Williams

### Assistant Professional Specialists and Concurrent

#### Lecturers:

Elena Mangione-Lora; Odette Menyard; Rachel Parroquin; Sandra Teixeira

**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 foreign languages, literatures, and cultures provides educational opportunities relevant to an increasingly interdependent world. A crucial component of a liberal education, the acquisition of foreign-language skills enhances our powers of communication and serves to introduce us to the enduring cultural achievements of other peoples. Moreover, the study of a foreign language broadens our mental horizons, encourages us to think and act more globally, and stimulates our understanding of the traditions of other nations. Elementary and intermediate courses develop the students' ability to understand, speak, read, and write a foreign language with facility and confidence.

Upper-division courses present a wealth of literary, historical, and cultural traditions and emphasize the nature and development of national 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. And still others inculcate the critical and analytical skills necessary for an informed interpretation of foreign language texts. Participation in Notre Dame's international study programs in Brazil, Chile, France, Italy, Mexico, and Spain (see the International Study Programs section of this Bulletin) is highly recommended although not required to pursue a major in Romance languages and literatures. Majors and supplementary majors in French, Italian, and Spanish must complete 50 percent of their credit hours in the major in residency at Notre Dame and meet the following program requirements. For current information visit the department website: <http://romancelanguages.nd.edu/>.

### PROGRAM IN FRENCH AND FRANCOPHONE STUDIES

#### The Major in French and Francophone Studies

The requirements for a major in French and Francophone Studies consist of successful completion of 30 credit hours or 10 courses above ROFR 20201. Of these 10 courses, no more than three may be at the 20xxx level (20202 and above), six must be in literature/culture studies, and at least half must be taken in residence at Notre Dame. Required among these 10 courses are ROFR 30310 (The Art of Interpretation), ROFR 30710 and ROFR 30720 (French Literature and Culture I & II), at least two courses at the 40xxx level, and the Senior Seminar (ROFR 53000). ROFR 30310 (The Art of Interpretation) is the recommended prerequisite for the survey courses (ROFR 30710 and ROFR 30720) and must be completed by the end of junior year. The requirement of ROFR 30720 (French Literature and Culture II) may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Preapproved courses at the Université Catholique de l'Ouest in Angers (IALH 1.1, 1.2, 4.2, and 6.1) may also fulfill the required courses ROFR 30310, ROFR 30710, and/or ROFR 30720 (see the Angers pages in this Bulletin for a description of those courses and their equivalencies at Notre Dame). Any other substitution will require the approval of the Undergraduate Coordinator in French. ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged. AP credit may not be applied to the major.

#### The Supplementary Major in French and Francophone Studies: Two Tracks

There are two tracks available for students seeking a supplementary major: The “Language and Literature” track and the “Language and Culture” track.

#### Language and Literature Track

Requirements for the “Language and Literature” track consist of successful completion of 24 credit hours or eight courses above ROFR 20202. Of

## ROMANCE LANGUAGES AND LITERATURES

these eight courses, no more than two may be at the 20xxx level (20202 or above), one must be ROFR 27500 or above, and six must be in literature/culture studies, and at least half must be taken in residence at Notre Dame. Required among these eight courses are ROFR 30310 (The Art of Interpretation), ROFR 30710 and ROFR 30720 (French Literature and Culture I & II), and at least two courses at the 40xxx level or above, one of which may be the Senior Seminar (ROFR 53000). ROFR 30310 (The Art of Interpretation) is the recommended prerequisite for the survey courses (ROFR 30710 and ROFR 30720) and must be completed by the end of junior year. The requirement of ROFR 30720 (French Literature and Culture II) may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Preapproved courses at the Université Catholique de l'Ouest in Angers (IALH 1.1, 1.2, 4.2, and 6.1) may also fulfill the required courses ROFR 30310, ROFR 30710, and/or ROFR 30720 (see the Angers pages in this Bulletin for a description of those courses and their equivalencies at Notre Dame). Any other substitution will require the approval of the Undergraduate Coordinator in French. ROFR 30320 (Advanced Composition: The Art of Writing) is strongly encouraged. AP credit may not be applied to the major.

#### *Language and Culture Track*

Requirements for the “Language and Culture” track consist of successful completion of 24 credit hours or eight courses above ROFR 20202. Of these eight courses, no more than two may be at the 20xxx level (20202 or above), one must be ROFR 27500 or above, and six must be in language/culture/literature studies, and at least half must be taken in residence at Notre Dame. Required among the eight courses are: ROFR 30310 (The Art of Interpretation) or ROFR 30320 (Advanced Composition: The Art of Writing); one survey class of French literature (ROFR 30710 or ROFR 30720); ROFR 37500 (Contemporary Issues, Past and Present); and ROFR 47500 (Timelessness and Modernity). The survey class of French literature may be waived if students take both ROFR 373AF and ROFR 374AF in Angers—that is, two advanced courses on 19th- and 20th-century French literature. Some courses at the Université Catholique de l'Ouest in Angers may also fulfill the required courses, as in the “Language and Literature” track (see above). Any other substitutions will require the approval of the Undergraduate Coordinator in French. AP credit may not be applied to the major.

#### **The Honors Track in French**

The honors track major consists of 33 credits or 11 courses. In addition to the general requirements for the major, honors track students must complete an 11th course at the graduate level with a grade of A- or higher, in which they will write a substantive research paper, normally in French, which constitutes the honors thesis. By invitation only, highly motivated students may consider the option of taking a semester-long directed reading tutorial as

the 11th course, completing an honors thesis under faculty direction.

French majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. To be eligible for the honors track, students must be first majors with a minimum GPA of 3.8 in French and have completed at least seven courses toward the major by the end of their junior year. They must also receive the written support of a professor in one of the required language, culture, or literature courses (ROFR 30310, ROFR 30320, ROFR 30710, ROFR 30720, or ROFR 37500). For full consideration, students should contact the assistant chair of the Department of Romance Languages and Literatures no later than March 15 of their junior year; applications from eligible seniors will be accepted through October 1. In order to graduate with honors, students admitted to the honors track should maintain a minimum GPA of 3.7 in French.

#### **Combined B.A./M.A. Program in French**

The Department of Romance Languages and Literatures offers its majors in French the opportunity to participate in its graduate program through a combination B.A./M.A. degree in French. This program requires students to take 30 credit hours during the normal four-year undergraduate period, followed by a total of 30 credit hours of graduate courses taken during the fourth and fifth years of residence. Six credit hours can be counted toward both the undergraduate and graduate degrees. During their senior year, participants in this program take two graduate courses, take the qualifying exam given to all first-year graduate students, and apply to the Graduate School for admission during the Spring semester. B.A./M.A. students are eligible for a teaching fellowship during their fifth year that includes a tuition waiver and a generous teaching stipend. Well qualified students who are interested in this program should contact the director of Graduate Studies and/or the graduate coordinator in French at the beginning of their junior year.

#### **PROGRAM IN ITALIAN LITERATURE AND CULTURE**

The undergraduate program in Italian offers a major, a supplementary major, and an honors track major in each of two possible concentrations: (1) Italian literature and culture; (2) Italian Studies. In addition, the program also offers (3) a minor in Italian, and (4) a combined B.A./M.A. in Italian.

##### *(1) Literature and Culture Concentration*

#### **The Major in Italian: Literature and Culture Concentration**

The major in Italian with a concentration in literature and culture requires 30 credits or 10 courses at the 20000 level or above, including no more than two 20000-level courses (ROIT 20215 counts as two courses for the major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT

30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of five elective ROIT courses in Italian literature or culture at the 30000 or 40000 level or above. ROIT 30310 (Passage to Italy) is recommended for all majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

#### **The Supplementary Major in Italian: Literature and Culture Concentration**

Supplementary majors in Italian with a concentration in literature and culture are expected to demonstrate competency in the language and to complete 24 credits or eight courses at the 20xxx level or above, including no more than two 20xxx-level courses (ROIT 20215 counts as two courses for the supplementary major), ROIT 30711 (Medieval-Renaissance Italian Literature and Culture), ROIT 30721 (Modern Italian Literature and Culture), ROIT 53000 (Italian Seminar), and a minimum of three elective ROIT courses in Italian literature or culture at the 30xxx or 40xxx level or above. ROIT 30310 (Passage to Italy) is recommended for all supplementary majors. A maximum of two of these elective ROIT courses may be conducted in English or with texts in translation, or may be substituted by courses on Italian subjects originating in other disciplines or departments (for example, architecture, art history, music, or history). Equivalent Italian language, literature, or culture courses from foreign study programs or other universities may be substituted for any of the courses by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

#### **The Honors Track Major in Italian: Literature and Culture Concentration**

The honors track major in Italian with a concentration in literature and culture consists of 33 credits or 11 courses, including all the requirements for the major, a GPA in the major of at least 3.7, 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. No students will be accepted to the honors track after October 1 of their senior year.

##### *(2) Italian Studies Concentration*

#### **The Major in Italian: Italian Studies Concentration**

The major in Italian with a concentration in Italian Studies requires 30 credits or 10 courses at the 20000 level or above, to be chosen as follows: Five courses

## ROMANCE LANGUAGES AND LITERATURES

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; ROIT 41590 (Italian Theatre Workshop) does not count toward this major. No more than two of these five courses may be at the 20000 level (ROIT 20215 counts as two courses for the major). The other five courses must be on Italian subjects or strictly relevant to Italian culture, and together they must not be drawn from more than three disciplines or departments, such as history, art history, classics, FTT, music, or political science (the courses may of course be listed under ROIT). Four of these five courses must be at the 30000 level or above, and include at least one course at the 40000 level or above; no more than one of the five may be at the 20000 level. In order to create a coherent program, the selection of courses must be approved by the student's ROIT adviser (or committee, if appropriate). Equivalent courses from foreign study programs or other universities may be substituted by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

#### **The Supplementary Major in Italian: Italian Studies Concentration**

The supplementary major in Italian with a concentration in Italian Studies requires 24 credits or eight courses 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; ROIT 41590, Italian Theatre Workshop, does not count toward this supplementary major. 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 student's ROIT adviser (or committee, if appropriate). Equivalent courses from foreign study programs or other universities may be substituted by permission. Fifty percent of the credits for the major must be taken in residence at Notre Dame. AP credit may not be applied toward the major.

#### **The 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. No students will be accepted to the honors track after October 1 of their senior year.

#### **(3) *The Minor in Italian***

The minor in Italian comprises 15 credits or five courses at the 20000 level or above, including at least three courses at the 30000 or 40000 level. Three of the five courses must be ROIT courses in Italian language, literature, and culture, and taught in Italian; the fourth and fifth courses may be on Italian literature and culture taught in English or with texts in translation, or may be courses on Italian subjects originating in other disciplines or departments (for example, LLRO, art history, architecture, or history). Courses from foreign study 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.

#### **(4) *The Combined B.A./M.A. Program in Italian (Literature and Culture Concentration)***

The Department of Romance Languages and Literatures offers its majors in Italian with a concentration in literature and culture the opportunity to participate in its graduate program through a combination B.A./M.A. degree in Italian. This accelerated program requires students to take 30 credit hours at the 20000 level or above during the normal four year undergraduate period, followed by a total of 30 credit hours of graduate courses taken during the fourth and fifth years 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, as well as the two-semester core course required of all first-year graduate students in Italian, and apply to the Graduate School for admission during the spring semester. B.A./M.A. students are eligible for a teaching fellowship during their fifth year that includes a tuition waiver and a generous teaching stipend. Students should have a strong academic record and substantial progress toward their Italian major completed 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 Italian at during their junior year, before registering for the first semester of their senior year.

#### **PROGRAM IN IBERIAN AND LATIN AMERICAN STUDIES**

All majors and supplementary majors in Spanish are required to take a core sequence consisting of ROSP 30310 (Textual Analysis) and one course in each of the following areas of Spanish and Spanish American Literature: Early Peninsular, Modern Peninsular, Early Spanish American and Modern Spanish American. AP credit may not be applied toward the major.

#### **The Major in Spanish**

The major in Spanish requires 30 credits or 10 courses 20202 and above, including the required core sequence described above or equivalents, two senior-level courses, and the Senior Seminar. Equivalent courses from international study 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.

#### **The Supplementary Major in Spanish**

Supplementary majors in Spanish are required to complete 24 hours or eight courses 20202 and above, including the required core sequence described above or equivalents and one senior-level course. Equivalent courses from international study 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.

#### **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; and the fourth and fifth courses may be on a Portuguese or Brazilian subject in another discipline (for example, anthropology, history, Latin American Studies, FTT, political science, Romance languages and literatures, theology, etc.). Courses from foreign study 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 area studies and other interdisciplinary minors. Spanish courses offer a particularly appropriate complement to the Latin American Studies, 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.

#### **The Honors Track in Spanish**

The honors track major consists of 33 credits or 11 courses. In addition to the general requirements for the major, honors track students must complete an 11th course at the graduate level and must receive

## ROMANCE LANGUAGES AND LITERATURES

a grade of A- or higher to graduate with honors, in which they will write a substantive research paper that constitutes the honors thesis. By invitation only, highly motivated students may consider the option of taking a semester-long directed reading tutorial as the 11th course, completing an honors thesis under faculty direction.

Spanish majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. To be eligible for the honors track, students must be first majors with a minimum GPA of 3.7 and at least seven courses toward the major. For full consideration, students should contact the coordinator of undergraduate studies no later than March 15 of their junior year; applications from eligible seniors will be accepted through October 1.

### 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, the qualifying oral exam given to all first-year graduate students, and apply 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.

### MAJOR IN ROMANCE LANGUAGES AND LITERATURES

The undergraduate major in Romance Languages and Literatures is designed for qualified students who wish to major in two programs (French, Italian, or Spanish). Cross-cultural in focus, the major recognizes the importance of studying the correspondences and differences among various Romance literatures and cultures and of reexamining traditional disciplinary boundaries. The requirements for a major in Romance languages and literatures include competency in two languages and successful completion of 36 credit hours or 12 courses, which must be distributed equally between the two respective language programs as follows:

(1) Two survey courses in each language and literature program (French or Italian); Spanish requires

either four survey courses (two in peninsular and two in Latin American) or a combination of two survey courses in one area and two senior-level courses in the other area;

(2) Textual Analysis in one program;

(3) Two 40xxx-level courses in each program (if the survey requirement in Spanish is fulfilled with two senior-level courses, these courses may count for the senior-level requirement in Spanish);

(4) One senior seminar in one program;

(5) Two elective courses in the department (any exception requires permission).

### The Honors Track in Romance Languages and Literatures

To be eligible for the honors track, students in Romance Languages and Literatures must be first majors with a minimum GPA of 3.7 in the major, and will have completed at least eight courses toward the major. It is strongly recommended that students take at least one 400-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 a capstone comparative honors thesis in lieu of taking the graduate course. The honors thesis option must be carried out under the direction of two department faculty members, one in each area of specialization. Students interested in this option must follow the same procedures as those outlined above. He or she will identify the professor with whom he or she intends to work, obtain approval of the topic, and submit application materials by March 15th of the junior year. Students are also encouraged to take at least one course that addresses cultural or literary theoretical questions and readings; this course may be a 400-level course offered in the Department of Romance Languages, or a similar course in a related field (English, gender studies, FTT, philosophy, sociology, etc.). Romance languages and literatures majors are admitted to the honors track by invitation, although qualified students may petition for admission in the second semester of their junior year. For full consideration, students should contact the advisor for the romance languages and literatures major no later than March 15 of their junior year. Applications for eligible seniors will be accepted through October 1st.

### Placement in Language Courses

For French and Spanish, there is an online placement exam for students who have not already demonstrated language proficiency through national standardized testing, such as the AP or Achievement tests. Students with previous experience are required to take one of these tests before enrolling in their first course in those languages. For Italian or Portuguese

placement, please contact the department. The normal prerequisite for a 30xxx-level course is at least one 20xxx-level course or permission of the instructor. The normal prerequisite for a 40xxx-level course is at least one 30xxx-level course or permission of the instructor.

### Policy Regarding Romance Language Placement Examination

The placement examination is designed to place each student at an appropriate level within a language sequence. Obtain placement examination information from the Department of Romance Languages and Literatures.

### MAJOR IN INTERNATIONAL ECONOMICS

The newly created 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 seven to ten intermediate and advanced courses in French, Italian or Spanish, including at least four courses with a cultural, economic and/or historical emphasis. 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. Under the guidance of a faculty mentor, all International Economics majors integrate their economic and language and culture study into a Senior Capstone research paper/project or senior thesis. The senior capstone project is intended to provide an experience that integrates the analytical aspects of economics with the linguistic and cultural aspects of a romance language.

Students must satisfy a mathematics requirement of Calculus I and II and successfully complete ECON 10010/20010; ECON 10020/20020; ECON 30010; ECON 30020; ECON 30330; ECON 30331; and either ECON 40700 and ECON 40800, or ECON 40710 and ECON 40720. In addition, students must complete at least one fourth semester or above language and culture course (ROXX 20202 or above); "Exploring International Economics" (briefly described above); one introduction to literature and culture course (ROXX 30310); two 3000 level courses including literature survey courses (ROXX 30710, 30720, and/or ROSP 30810, ROSP 30820) or equivalent, and/or culture courses ROFR 37500 or ROSP 37715, ROSP 37815 or ROSP 37825; at least two courses at the 40000 level (at least one taught in the target language ROXX); and a senior seminar course (ROXX 53000) or paper/project or year-long senior thesis (LLRO or ECON 47000) under the supervision of a faculty member from either department.

Through the new major, the collaborating departments seek to blend two programs of study to ensure that students will achieve advanced linguistic and cultural competency in a foreign language as well as excellent preparation in Economics. The balance



## SOCIOLOGY

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.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Romance Languages & Literature*
- *French*
- *Italian*
- *Portuguese*
- *Spanish*

Course descriptions can be found by clicking on the subject code and course number in the search results.

## Sociology

### Chair:

Rory McVeigh  
*William R. Kenan Jr. Professor of Sociology:*  
 Joan Aldous (emerita)  
*William P. and Hazel B. White Professor of Sociology:*  
 Maureen T. Hallinan (emerita)  
*Eugene Conley Professor of Sociology:*  
 Jorge Bustamante  
*Julian Samora Chair in Latino Studies:*  
 Gilberto Cárdenas  
*William R. Kenan Jr. Endowed Chair:*  
 Christian Smith

### Professors:

Mark Berends; Fabio B. Dasilva (emeritus); Robert M. Fishman; Eugene W. Halton; Rory McVeigh; Daniel Myers; Lynette P. Spillman; J. Samuel Valenzuela; Andrew J. Weigert; Michael R. Welch

### Associate Professors:

William J. Carbonaro; Kevin J. Christiano; Jessica Collett; David Gibson; David S. Hachen Jr.; David M. Klein (emeritus); Richard A. Lamanna (emeritus); Omar Lizardo; Ann Mische; David Sikkink; Erika Summers-Effler; Richard A. Williams

### Concurrent Assistant Professor:

Mark L. Gunty

### Assistant Professors:

Megan Andrew; Kraig Beyerlein; Larissa Fast; Jennifer Jones; Mary Ellen Konieczny; Amy Langenkemp; Elizabeth Aura McClintock; Erin Metz McDonnell; Terence McDonnell; Atalia Omer; Jason Springs

### Adjunct Instructor:

Russell S. Faeges

### Adjunct Assistant Professor:

Mim Thomas

### Director of Undergraduate Studies:

Ann R. Power

### Associate Professional Specialist:

Ann R. Power

**Program of Studies.** The Department of Sociology has a national reputation. Its scope of interest is worldwide, yet it also is intensely concerned with the U.S. cultural and social experience and its problems.

The requirements for a sociology major reflect a program that offers both structure and flexibility. The program is designed to acquaint the student with the core of the discipline and with areas of specialization which can be studied in some depth.

Sociology deals with human interaction on the group level wherever it may occur: in family and business, law and politics, medicine and religion, and a host of other settings. What can you do with a sociology degree? With its focus on developing both critical analysis and technology-driven research skills, a sociological background will help you prepare for work in almost any field. Notre Dame's sociology alumni enter fields as diverse as business,

law, medicine, health care administration, politics, religious ministries, research institutes, social work, teaching, and academia.

The requirements for the sociology 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  
 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.

The department prides itself on its program of close personal advising, in which each major can build a program of courses with the help of a faculty advisor and undergraduate director. Advisors willingly give much time to aid students in planning their course schedules and careers. Each major is assigned to a faculty advisor whose own academic interests dovetail with those of the student. Each student, working closely with a faculty advisor, can map out a personalized program of study that will satisfy the department's requirements for the major and simultaneously accommodate the student's academic interests and career aspirations.

The sociology major combines well with many majors. More recent graduates have also majored in business; pre-medical studies; psychology; political science; economics; film, television and theatre; or a foreign language. Students have also easily combined their sociology major with a minor in education, schooling, and society; international peace studies; Hesburgh Program in Public Policy; Latino studies; or business economics. It is important to note that students in another college who wish to major in sociology in addition to their first major do not have to meet all the other requirements of the College of Arts and Letters but rather just those of their first major's college.

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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.

The department also encourages students to join the University of Notre Dame Sociology Club. The purpose of this club is to enrich the sociology major. This student organization sponsors activities oriented to careers in sociology and sociology-oriented topics, as well as purely social activities. Majors and non-majors are welcome to join.

**Sociology Undergraduate Honors Track.** The Sociology Department offers an honors track to students who excel in their sociological studies. Students must have taken at least one introductory course in sociology and be recommended by a faculty member or initiate the process by contacting the director of undergraduate studies. In addition to the usual requirements of the sociology major, students in the honors track are required to take at least one graduate-level course in sociology once they have completed the required 30xxx-level courses. When appropriate, a student may be given permission to take the graduate-level statistics sequence rather than beginning with the undergraduate statistics course (SOC 30903). In their senior year, students in the sociology honors track are required to enroll in the Senior Thesis Capstone Project (SOC 48009) for at least one semester and, under faculty mentors, carry out independent research projects. Students complete a senior thesis based on this research and submit their manuscripts to *Sociological Voices* or another journal for publication. Participants are also required to submit an abstract of their paper to at least one regional sociology conference during their junior or senior year. Continuation in the program is subject to periodic review.

**Writing in Sociology.** The College of Arts and Letters is proud of the level of writing its undergraduates achieve. One way in which the college supports students' writing development is by requiring each department to offer at least one writing-intensive course. SOC 30900, Foundations of Sociological Theory, is the Sociology Department's writing-intensive course. There, students reflect on the quality of their own and others' writing and learn to articulate a sociological perspective in writing. Instructors in this course may spend more time doing textual analyses, going over students' writing, holding in-class writing workshops, and giving opportunities to do re-writes than in other courses. The department's 43xxx-level courses also demand high-level writing within a sociological perspective. In addition, students may opt to develop their research and writing skills by undertaking a senior thesis. Any sociology major may submit a paper to *Sociological Voices*. *Sociological Voices* is a journal dedicated to publishing sociological research by undergraduate students at Notre Dame. It serves as a

forum where undergraduates can publish and receive recognition for scholarly accomplishments.

**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 concentration in the major in order to deepen their knowledge of that area. Students are also encouraged to pursue research opportunities within their area of concentration.

#### GENERAL INTRODUCTIONS TO SOCIOLOGY

- 10002/20002. Understanding Societies
- 10033/20033. Introduction to Social Problems
- 10722/20722. Introduction to Social Psychology
- 23011. Selflessness and Selfishness

#### REQUIRED COURSES FOR SOCIOLOGY MAJORS

- 30900. Foundations of Sociological Theory
- 30902. Methods of Sociological Research
- 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, GENDER, RACE, ETHNICITY

- 20810. Gender Roles and Violence in Society
- 20838. Social Inequality
- 30806. Race and Ethnicity: Constructing Identity and Difference
- 30838. Poverty, Inequality, and Social Stratification
- 30846. Today's Gender Roles
- 43839. Unequal America

#### CRIMINOLOGY, DEVIANCE, AND SOCIAL CONTROL

- 20732. Introduction to Criminology
- 43704. Law, Society and Criminal Justice in the U.S.
- 43730. Crime and Deviance in Ideological Perspective
- 43732. Controversies and Crises in Modern Criminology

#### CULTURE/MEDIA

- 20100. Introduction to Cultural Sociology
- 30109. Sociology of Culture
- 30151. Popular Culture
- 33191. Consumer Culture and the Cultures of Consumption
- 40001. Time and Society
- 43101. Telling About Society: Media, Representation, and the Sociology of Knowledge
- 43110. Sociology of Media, Technology, and Society
- 43113. Cultural Sociology
- 43162. The Aesthetics of Latino Culture
- 43165. Art in Everyday Life
- 43171. Materializations of America
- 43197. Culture, Morality and Society

#### DEMOGRAPHY/MEDICAL

- 20410. Health, Medicine, and Society
- 30054. Cultural Aspects of Clinical Medicine
- 43402. Population Dynamics

#### ECONOMICS, POLITICAL

- 20501. Globalization and Social Movements
- 20502. Today's Organizations
- 20533. Responding to World Crisis
- 20541. Sociology of War and Terror
- 20550. Development and Human Well-being
- 23518. Energy, Society and the Environment
- 30505. Aid and Violence
- 30514. Social Movements
- 30567. Chile in Comparative Perspective
- 30581. Racism and Activism: From Civil Rights to Tea Parties
- 40505. Globalization and Its Discontents: Ethical Perspectives on Economy, Conflict, and Human Values
- 40604. Tolerating Intolerance: Religion, Secularization and Peace
- 40606. Religion and Democracy in Comparative Perspective: Islam, Judaism, Christianity
- 40607. Religion, Civil Disobedience and Non-violent Resistance
- 43510. Governance and Africa
- 43513. Sociology of Development
- 43524. Employment in a Changing Economy
- 43527. Social Network Analysis
- 43553. Building Democratic Institutions
- 43558. Comparing European Societies
- 43563. Nationalism and Globalization
- 43590. Sociology of Economic Life

#### EDUCATION

- 20228. Social Inequality and American Education
- 20260. Religion and Schooling in American Society
- 43228. Controversies in Education
- 43240. Research on School Effects

#### FAMILY

- 20342. Marriage and Family
- 43377. Family, Gender, and Employment

#### LATINO STUDIES

- 20479. Introduction to Latinos in American Society
- 23470. Making Latinos: The Complexities of Latino Identity
- 30048. Latinos and the City
- 43016. Visual Sociology: Exploring Society Photographically
- 43162. The Aesthetics of Latino Art and Cultural Expression
- 43404. International Migration: Mexico and the United States
- 43479. International Migration and Human Rights

#### RELIGION

- 20610. Sociology of Religion
- 30600. Peace vs. Justice: What is Just Peace?
- 30602. Jerusalem: Peace or Apocalypse?
- 30651. God, Country and Community: Religion and Public Life in America
- 30671. Catholicism in Contemporary America
- 30672. Religion and Social Life

## THEOLOGY

30675. Religion, Modernity, Secularization, Religious Persistence  
 43600. Society and Spirit: Religion in Classical Social Thought  
 43662. Religion and American Society  
 43691. Religion and Social Activism  
 48601. Society and Religious Research

**SOCIAL PSYCHOLOGY**

10722. Introduction to Social Psychology  
 20722. Introduction to Social Psychology  
 33001. Society, Self, and Catholic Social Tradition  
 43713. Socialization and the Life Course  
 43719. Self, Society, and the Environment  
 43774. Society and Identity

**THEORY/METHODOLOGY**

43901. Power and Identity in Modern Society  
 45900. Special Practicum in Journal Publishing  
 48002. Doing Sociology: Quantitative Senior Research Practicum

**SUMMER ONLY**

30019. Sociology of Sport

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Sociology*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Graduate Courses.** Senior majors may take any 60000-level graduate course with the permission of the instructor and the Director of Undergraduate Studies. Honors track students are required to do so.

**Theology***Chair:*

J. Matthew Ashley

*Catherine F. Huisking Professor of Theology:*

Rev. Brian E. Daley, S.J.

*Catherine F. Huisking Professor of Theology:*

Cyril J. O'Regan

*Hesburgh Professor of Catholic Theology:*

Gary A. Anderson

*John A. O'Brien Professor of Theology:*

Joseph Blenkinsopp (emeritus)

*John A. O'Brien Professor of Theology:*

Lawrence S. Cunningham (emeritus)

*John A. O'Brien Professor of Theology:*

Rev. John S. Dunne, C.S.C.

*John A. O'Brien Professor of Theology:*

Jean Porter

*John A. O'Brien Professor of Theology:*

James C. VanderKam

*John Cardinal O'Hara Professor of Theology:*

Gustavo Gutierrez, O.P.

*Keough-Hesburgh Professor of Music History and Liturgy:*

Margot Fassler

*Notre Dame Professor of Pastoral and Hispanic Theology:*

Rev. Virgilio P. Elizondo

*Theodore M. Hesburgh, C.S.C., Professor of Philosophy and Theology:*

Rev. David B. Burrell, C.S.C. (emeritus)

*Walter Professor of Theology:*

David E. Aune

*Walter Professor of Theology:*

Gerald P. McKenny (on leave 2011-12)

*William K. Warren Professor of Catholic Theology:*

Rev. John P. Meier

*William K. Warren Professor of Catholic Theology:*

Rev. Thomas F. O'Meara, O.P. (emeritus)

*Professors:*

Ann Astell; Gerard F. Baumbach (concurrent);

Celia Deane-Drummond; Keith J. Egan

(adjunct); Mary Catherine Hilbert, O.P.; Rev.

Maxwell E. Johnson; M. Cathleen Kaveny;

Robert A. Krieg; Rev. Edward A. Malloy, C.S.C.;

Timothy Matovina; Nathan Mitchell; Francesca

A. Murphy; Rev. Robert S. Pelton, C.S.C. (con-

current); Gabriel Said Reynolds; Rev. Gregory

Sterling; Lawrence Sullivan; Randall Zachman

*Research Professor:*

Robert Gimello

*Associate Professors:*

J. Matthew Ashley; John R. Betz; John C.

Cavadini; Mary Rose D'Angelo; Rev. Michael

S. Driscoll; David Fagerberg; Rev. Daniel

Groody, C.S.C.; Rev. Paul V. Kollman, C.S.C.;

Blake Leyerle; Bradley J. Malkovsky; Rev. Don

McNeill, C.S.C. (concurrent); Michael (Tzvi)

Novick; Rev. Paulinus Odozor, C.S.Sp.; Rev.

Hugh R. Page; Maura Ryan; Joseph Wawrykow;

Todd Whitmore; Robin Darling Young

*Assistant Professors:*

Yury Avvakumov; David A. Clairmont; Candida

Moss; Margaret Pfeil; Abraham (Avi) Winitzer

*Professional Specialists:*

Rev. Eugene F. Gorski, C.S.C.;

Janice M. Poorman

*Associate Professional Specialists:*

Rev. Michael E. Connors, C.S.C.

*Assistant Professional Specialists:*

Catherine Cavadini; Michael Heintz, C.S.C.;

Todd Walatka

**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 for the general public.

**Why major in theology?**

When the former British prime minister Tony Blair was asked what effect his embrace of Christian faith at the University of Oxford had on him, he commented simply, "I began to make sense of the world." A major in Theology at Notre Dame will challenge you to do just that.

Our majors encounter head-on the great questions of life: Where is the God of justice? What is truth? Who do you say I am? Why did God become a human? What must I do to inherit eternal life?

Yet majors in theology are challenged to do still more. They are challenged to think of their life journey not only in terms of how they might best be served by careers, but also how they might best serve others. Whether they go on to careers in law, medicine, business, journalism, education, ministry, government, or any other field, theology majors do so with an experience of intellectual and spiritual illumination that is absolutely unique.

Our majors also benefit from working closely with faculty in one of the premiere Catholic Departments of Theology in the world. Theology majors at Notre Dame have majored in a field for which Notre Dame is renowned and will study with the best of the best. In addition, our majors may have the opportunity to visit the Holy Land at the Tantur Ecumenical Institute of Theology in Jerusalem, where the department regularly hosts courses and a pilgrimage during fall and spring break.

When Father Edward Sorin, C.S.C., envisioned the school that would be built next to two remote lakes in Indiana, he commented, "This college will be one of the most powerful means of doing good in the country." This faith in the great potential of the school that would be called Notre Dame emerged from his belief in a Catholic education. Theology majors at Notre Dame, having experienced the

## THEOLOGY

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 25 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.

The formally required courses for the primary and supplementary major are identical, and total 10 credit hours: the two-semester sequence in the history of Christian thought; an upper-division scripture course; and the one-credit hour proseminar offered each spring, which introduces students to the variety of topics and approaches covered in the study of theology. All courses in the theology major, primary or supplementary, must be 3-credit courses and graded (with the exception of the proseminar).

### SUMMARY OF THE PRIMARY MAJOR:

First University requirement (Foundations of Theology): THEO 10001 (first-year) or 10002 (sophomore, junior, senior) or 13183 (University seminar) or 13002 (honors).

Second University requirement (a “development of theology” course): a THEO course listed between 20101 and 29999.

THEO 40201 and 40202—Christian Traditions I and II

THEO 40101 or 40108—Old Testament or New Testament

Electives (15 hours at the upper level)

THEO 43001—Proseminar (1 credit)

Including the University requirements, the primary major thus consists of 31 credit hours.

### SUMMARY OF THE SUPPLEMENTARY MAJOR:

First University requirement (Foundations of Theology): THEO 10001 (first-year) or 10002 (sophomore, junior, senior) or 13183 (University seminar) or 13002 (honors).

Second University requirement (a “development of theology” course): a THEO course listed between 20101 and 29999.

THEO 40201 and 40202—Christian Traditions I and II

THEO 40101 or 40108—Old Testament or New Testament

Electives (9 hours at the upper level)

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 3.67 within the major is normally expected. Seniors in the Honors Program will enroll in a one-credit Honors Colloquium as well as a one-credit honors research course in the fall semester, and a three-credit Honors Thesis Writing course in the spring semester, culminating in the submission of a 50-page thesis. The Honors Program will normally consist of 36 hours, as compared to 31 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. The minor in theology is accepted by many parochial schools as adequate preparation for secondary school teaching.

#### Contact information

You may reach the director of undergraduate studies in theology, through the departmental office:

(574) 631-7811

[reynolds@nd.edu](mailto:reynolds@nd.edu)

[theology.nd.edu/undergraduate-programs](http://theology.nd.edu/undergraduate-programs)

Department of Theology

130 Malloy Hall

University of Notre Dame

Notre Dame, IN 46556-5601

### WRITING-INTENSIVE REQUIREMENT

THEO 40101 Old Testament and 40108 New Testament have been designated writing-intensive courses by the Department of Theology. All majors are required to take one of these courses in fulfillment both of their upper-level scripture requirement within the major and of the College of Arts and Letters' writing-intensive requirement. Students will be expected to work closely with the professor throughout the semester on a significant written project, although specific writing assignments will be designed by the faculty member teaching the course.

### PHILOSOPHY AND THEOLOGY JOINT MAJOR

#### *Director:*

Director of Undergraduate Studies, Theology

#### *Faculty:*

Additional faculty for the joint major are drawn from the Departments of Philosophy and Theology.

**Program of Studies.** The joint major is intended for undergraduates who are intrigued by philosophical and theological ideas and who have an equal commitment to both disciplines. It seeks to equip such students to handle theology and philosophy adeptly. The major is structured, providing undergraduates with a suitable introduction to the study of both disciplines, but also flexible, granting students considerable scope for the pursuit of their own interests.

The joint major offers the opportunity for an informed investigation of religious and philosophical ideas and should appeal especially to those who intend to pursue graduate work in philosophy or theology.

The joint major incorporates the University requirements in the two departments and most of the formal requirements of the first majors in theology and philosophy. Students in the joint major will take the two-semester sequence in Christian Traditions and an upper-level course in Scripture. The joint major, however, does not require the one-credit proseminar in theology.

Other formal requirements are peculiar to the joint major. Students will study a classical language for two semesters. (For practical as well as pedagogical reasons, this will normally be Greek or Latin.) Majors will also be expected to take on one occasion the joint seminar (offered each spring). Each seminar, led by a theologian and a philosopher, will examine an issue in which the differing approaches of philosophy and theology may prove fruitful. The topic and instructors will change from year to year. Finally, each major will submit a senior thesis prepared under the direction of two advisors, drawn from each department. At the option of the directors, this thesis may be presented and discussed in an informal colloquium consisting of the other students in the joint major.

The remaining courses in the joint major will be at the discretion of the student. Normally taken at the 40xxx level, there should be an equal distribution in the electives between theology and philosophy. However, students may devote up to six hours within the joint major to additional language work. These hours may add to the classical language previously studied, or used to begin another language of significance for philosophical and theological work.

The 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

## SUPPLEMENTARY MAJORS, MINORS, AND SPECIAL PROGRAMS

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:**

PHIL 10101 or 20201, and 20xxx-level course (University-required courses; a higher-level course may be substituted for the latter).

PHIL 30301 and 30302. History of Philosophy I and II.

PHIL 30313. Formal Logic.

**Requirements in Theology:**

THEO 10001 or 10002 and 20xxx-level course (University-required courses).

THEO 40201 and 40202. Christian Traditions I and II.

THEO 40101 or 40108. Upper-division scripture course.

Plus:

Classical language (normally Greek)—two semesters.

Joint seminar.

Senior thesis.

18 credit hours of electives (up to six of these may be additional hours in language study).

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Catholic Social Tradition*
- *Religion and Literature*
- *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.

**CENTER FOR ASIAN STUDIES**

*Director:*

Jonathan Nobel

The program in Asian Studies introduces students to the complexity of the continent of Asia. Students select courses in a wide variety of fields, such as anthropology, East Asian languages and cultures, economics, film, television, and theatre, history, political science, and psychology. The Center for 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 professional school such as law or business. The supplementary major and the minor in Asian Studies provide recognition of students' training in this significant region of the world.

**THE SUPPLEMENTARY MAJOR IN ASIAN STUDIES**

The supplementary major in Asian Studies emphasizes the study of Asia as an integral part of the world today. Students study both its history and current aspects of culture, society, politics, literature, language, religion, etc. Required classes stress an interdisciplinary perspective through cross-listed classes found throughout Notre Dame.

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.

Finally, the program culminates in the senior year with a capstone essay on a student-chosen topic and advised by a faculty member. The curriculum requires 26 credit hours in addition to one year of language study.

*Requirements for the Supplementary Major:*

*Prerequisite:* One year of study of an Asian language (9–10 credit hours)

Asia-related courses from each of the following disciplines: (Total of 23 credit hours)

- At least one semester of an Asian language beyond the first year (3–5 credit hours)
- One social science (anthropology, economics, political science, psychology, or sociology) (3 credit hours)
- One humanities (theology, philosophy, or English) (3 credit hours)
- One history: one class in ancient, early, or modern history (3 credit hours)
- One literature (3 credit hours)
- Two general electives (fine arts highly recommended) (6 credit hours)
- Capstone project during the senior year (3 credit hours)

**THE GLYNN FAMILY HONORS PROGRAM**

In the fall semester of 1983, the University inaugurated an honors program for a small number of outstanding students in the College of Arts and Letters and the College of Science. A limited number of students with academic intents for each college are identified for this program at the time of admission. Although selection criteria include the promise of outstanding academic performance as demonstrated by standardized test scores and high school performance, the program is looking for more than mere academic ability. It hopes to identify students with a deep intellectual curiosity.

The program offers honors sections to fulfill most of the University and college requirements in the students' freshman and sophomore years. At present, there is the yearlong Honors Seminar (satisfying the writing and literature requirements), Honors Calculus, Honors Philosophy, Honors Theology, Honors Biology, Honors Physics, and an array of Honors Social Science courses. Since these courses are restricted to honors students, they are smaller than non-honors sections and are usually taught in a seminar format. The instructors for honors sections are chosen from the most outstanding faculty in each college. After the first year, students' academic work will be mainly centered in their major field (or fields) of study, but two or more honors electives are also taken during these years. In the fall of the senior year, there is an “Honors Thesis/Research Seminar,” which is followed by the “Moral Problems Seminar” in the spring. The fall seminar is intended to be a spur to the students' capstone project, whereas the spring seminar brings the honors students from diverse majors back together for some concluding topical discussions. All honors students will also be expected to complete a special six-hour senior research honors project in their major field of study. In science, this is the culmination of a research project that is begun earlier, and in arts and letters, it is a two-semester project culminating in a thesis. Those writing senior theses work individually under

## SUPPLEMENTARY MAJORS, MINORS, AND SPECIAL PROGRAMS

the direction of a faculty advisor of their choosing in their major field. Funds are available for research projects during summers either at Notre Dame or other universities.

In addition to the more narrowly academic features of the honors program, students will be offered various opportunities for broadening personal, cultural and spiritual growth. Regular colloquia, informal discussions and cultural excursions are available.

Further information on the structure and content of the honors program or on the criteria for admission may be obtained by contacting Prof. Alex Hahn or Prof. Cornelius Delaney, 309 O'Shaughnessy Hall, Notre Dame, IN 46556, 574-631-5398.

## ARTS AND LETTERS PRE-HEALTH STUDIES

### Director:

Vicki Toumayan  
Assistant Dean  
College of Arts and Letters

Students in the Arts and Letters Pre-Health Program are required to complete an arts and letters primary major in addition to the pre-health profession supplementary major. The APH2 program provides students who intend to pursue a career in medicine or other health profession with an opportunity to complete a major in the College of Arts and Letters while building a firm foundation in the basics of science. Most students elect the APH2 program because they wish to go on to medical or dental school; there are, however, students who intend to pursue other health-related careers or simply prefer the integration of science classes into the arts and letters curriculum. Medical schools encourage prospective applicants to seek a broad, liberal arts education, which enables them to develop skills that will be useful throughout life. The APH2 program provides students with all of the necessary prerequisites to prepare for the Medical or Dental College Admissions Test and can easily accommodate the completion of prerequisite courses for other health professions such as physical therapy, physician assistant, nurse practitioner occupational therapy, pharmacy, veterinary medicine, optometry, and podiatry.

The APH2 major consists of 10 core courses: MATH 10350 & 10360, BIOS 20201 & 20202 and labs, CHEM 10171 & 10172 with labs, CHEM 20273 & 20274 and labs, and PHYS 30210 & 30220 with labs, plus three upper-level science electives (nine credits). For premed students Biochemistry (CHEM 40420), Physiology (BIOS 30344), and Cell Biology (BIOS 30341) are strongly recommended. Students interested in one of the other health professions should choose APH2 electives in light of their prospective graduate program's requirements. CHEM 20204 and PHYS 20140 do not count toward the three upper-level science electives nor do research, special studies, or directed readings. Please note that a student may use no more than eight credits' worth of AP (Calculus only) toward the APH2 major. Transfer students may transfer a maximum

of 24 science credits for APH2; otherwise, credit for science classes taken outside of Notre Dame does not count toward the APH2 major.

For those students applying to medical school before 2015, only the 10 core classes must be completed before taking the MCAT, although the completion of one upper-level Biology course prior to the exam is recommended. Students planning to take the MCAT in 2015 or beyond should also take Biochemistry (CHEM 40420) as one of their APH2 electives prior to taking the MCAT. 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 in reference to the APH2 major is conducted by the APH2 advisor in 104 O'Shaughnessy. The sequencing of courses taken throughout the sophomore, junior and senior years is worked out by the student in consultation with the APH2 director and the student's departmental advisor so that the best schedule for each individual is arranged. One possible sequence is the following.

### THE PROGRAM OF COURSES

#### First Year

##### First Semester

WR 13100. Writing and Rhetoric	3
MATH 10350. Calculus A	4
CHEM 10171 and lab. Chemical Principles	4
Foreign Language	3
First Philosophy/First Theology	3
Physical Education	-
	17

##### Second Semester

University Seminar	3
MATH 10360. Calculus B	4
CHEM 10172 and lab. Organic Structure	4
Foreign Language	3
History/Social Science <sup>1</sup>	3
Physical Education	-
	17

#### Sophomore Year

##### First Semester

College Seminar	3
BIOS 20201 and lab. General Biology A	4
CHEM 20273 and lab. Organic Reactions and Applications	4
Foreign Language	3
Arts and Letters Major	3
	17

##### Second Semester

Arts and Letters Major	3
BIOS 20202 and lab. General Biology B	4
CHEM 20274 and lab. Chem/Periodic Table	4
First Theology/First Philosophy	3
Arts and Letters Major or Elective	3
	17

#### Junior Year

##### First Semester

PHYS 30210 and lab. Physics I	4
Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Social Science <sup>1</sup>	3
	16

##### Second Semester

PHYS 30220 and lab. Physics II	4
Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Literature	3
	16

#### Senior Year

##### First Semester

Science Elective	3
Arts and Letters Major	3
Arts and Letters Major	3
Second Theology/Second Philosophy <sup>2</sup> (Medical Ethics)	3
History	3
	15

##### Second Semester

Arts and Letters Major	3
Arts and Letters Major	3
Second Philosophy/Second Theology <sup>2</sup>	3
Fine Art	3
Arts and Letters Major or Elective	3
	15

#### Notes:

1. Starting in 2015 the MCAT will include material in psychology, sociology, and anthropology. Premed students should choose from among those disciplines in fulfilling the social science requirement(s).

2. Starting in 2015 the MCAT will include questions on ethics. Premed students should consider fulfilling the second philosophy requirement with a course on ethics.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Pre-health Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## SUPPLEMENTARY MAJORS, MINORS, AND SPECIAL PROGRAMS

**COMPUTER APPLICATIONS PROGRAM***Director:*

Charles R. Crowell

*Faculty:*

Kevin Barry; Louis J. Berzai; Kevin Casault; Mike Chapple; Christopher G. Clark; Amy Coughlin; Charles R. Crowell; Kenneth Dye; Donald K. Irmiger III; Patrick Miller; Katie Rose; Erik Runyon; Jeff Succ; Michael Villano

The Computer Applications Program (CAPP) was established as a supplementary major in the College of Arts and Letters as a way to provide undergraduate students with formalized training in computing. An important mission of CAPP is to provide undergraduate majors with proficiency in various facets of computing and information technology as a supplement to their primary majors and as a springboard for further professional education or a career in a technology-related field. Technology, Business, and Society (TBS) is a complementary skills program, which is very similar to a minor. Both programs serve as a window for Notre Dame undergraduates to the worlds of technology and business.

CAPP, established in the '70s, has been a highly successful programs for Arts and Letters students as well as students in other colleges. In terms of post-graduate job placements, the CAPP experience has been very attractive to employers, which has enabled students to be competitive in the job market. Even more important, however, has been the impact of CAPP on the lives of our majors as they move on to further education or directly into their careers. CAPP graduates commonly report that the experiences and skills they gained from the program have been extremely beneficial in the years since their graduation.

Both CAPP and TBS have three important educational goals for students. One is to provide students with sufficient knowledge of and exposure to technology that they understand the important role it plays in both personal and professional domains. As part of this understanding, students acquire a certain minimum proficiency with computing and information technology systems in two ways: By becoming acquainted the "languages" of technology used to develop technology-based systems; and by getting practice in the application of such systems to solve important problems or create functional tools.

A second goal of CAPP and TBS is to sensitize students to the ethical issues raised by contemporary uses of computing and information technology. In this goal we follow the recommendations of a recent national steering committee of computing and technology professionals who saw such learning as integral to the undergraduate educational experience. All program students take one required course from among several options in this curriculum area.

Finally, CAPP and TBS aim to increase awareness of the important and pervasive ways in which

technology affects both personal and professional domains within today's society. A curriculum category, Technology and Society, offers courses through which students become more aware of the broader influence and impact of technology on their lives.

CAPP and TBS has a foundational course in business knowledge. This course, taught by an experienced business professional, gives students an overview of the concepts and terminology critical to success in the business world. For CAPP, this course is an elective; for TBS, it is required.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Computer Applications*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**CAPP/TBS CREDIT HOUR REQUIREMENTS BY CURRICULUM CATEGORY**

	CAPP Hours	TBS Hours
I. Programming Languages	6	3
II. Technology Applications	12	3
III. Business Knowledge	N/A	3
IV. Technology-Related Ethics	3	3
V. Technology & Society	3	3
Total Needed	24	15

**CAPP and TBS Comparison**

<b>CURRICULUM CATEGORY</b>	<b>TYPES OF COURSES</b>	<b>CAPP REQUIRES</b>	<b>TBS REQUIRES</b>
Programming Languages	Visual Basic; Web Development; Research Methods in Computer Programming; JavaScript	2	1
Technology Applications	La Telenovela; E-Business Strategies; Applied Multimedia Technology; CAD for the Stage; Computers in Psych Research & Education; Practicum in Robotics; Interactive Media Motion Graphics; Digital 3-D Modeling; Music through Technology; Advanced Enterprise Applications; Information Design; Web Design 1	4	1
Business Knowledge	Foundations of Business Thinking	0	1
Technology-Related Ethics		1	1
Technology and Society	The Internet and Society; Information Security	1	1
<b>Total Courses (hours)</b>		<b>8 (24)</b>	<b>5 (15)</b>

**DUAL-DEGREE PROGRAM WITH THE COLLEGE OF ENGINEERING***Advisors:*

Cathy Pieronek, Assistant Dean for Academic Affairs, College of Engineering  
Ava Preacher, Assistant Dean, College of Arts and Letters

**Program of Studies.** The dual-degree, five-year 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 from 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. Because it is a demanding program, only students who have both the aptitude and motivation necessary for the five-year program should apply. Advisors for the program are available for consultation about the advisability of entering the program and about meeting the particular needs of each student already pursuing this program. Qualified students are eligible to receive modest scholarship support from the John J. Reilly Endowed Scholarship Program during their fifth year of study.

The decision to enter the program ordinarily should be made prior to beginning the sophomore year,

## SUPPLEMENTARY MAJORS, MINORS, AND SPECIAL PROGRAMS

although students can also enter the program at a later stage. There are three sets of requirements that must be met for the program: University requirements, College of Arts and Letters requirements, and College of Engineering requirements, as the following table indicates.

<b>University Requirements</b>	<i>Credit Hours</i>
Philosophy	6
Theology	6
Writing and Rhetoric	3
University Seminar+	(3)
History	3
Social Science	3
Literature or Fine Arts*	3
Mathematics (MATH 10550, 10560)	8
Natural Science (CHEM 10171, 10122)	7
	—
	39
<b>Arts and Letters Requirements</b>	
College Seminar	3
Literature or Fine Arts*	3
History or Social Science*	3
Language**	3/11
Major	30
	—
	42/45
<b>Engineering Requirements</b>	
MATH 20550, 20580	7
PHYS 10310, 10320	8
EG 10111, 10112	6
	—
	21
<b>Engineering Program</b>	
Engineering degree program (required courses and program or technical electives)	66/72
	—
<b>Total</b>	168/177
<b>Schematic Program of Studies</b>	
<i>First Semester</i>	
WR 13100. Writing and Rhetoric	3
History/Social Science*	3
MATH 10550. Calculus I	4
CHEM 10171. General Chemistry —Fundamental Principles	4
EG 10111. Introduction to Engineering Systems I	3
Physical Education	0
	—
	17
<i>Second Semester</i>	
University Seminar+	3
PHYS 10310. General Physics I	4
MATH 10550. Calculus II	4
CHEM 10122. General Chemistry —Biological Processes	3
EG 10112. Introduction to Engineering Systems II	3
Physical Education	0
	—
	17

<i>Third Semester</i>	
Theology/Philosophy	3
Modern Language	3
PHYS 10320. General Physics II	4
MATH 20550. Calculus III	3.5
Engineering Program†	3
	—
	16.5
<i>Fourth Semester</i>	
Theology/Philosophy	3
CSEM 23101. College Seminar	3
Modern Language	3
MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
Engineering Program†	3
Engineering Program	3
	—
	18.5
<i>Fifth Semester</i>	
Philosophy/Theology	3
History/Social Science*	3
Engineering Program	3
Arts and Letters Major‡	3
Engineering Program	3
Engineering Program	3
	—
	18
<i>Sixth Semester</i>	
Philosophy/Theology	3
Arts and Letters Major	3
Arts and Letters Major	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
	—
	18
<i>Seventh Semester</i>	
Literature*	3
History/Social Science	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
	—
	18
<i>Eighth Semester</i>	
Fine Arts*	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Engineering Program	3
Engineering Program	3
	—
	18
<i>Ninth Semester</i>	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
	—
	18

<i>Tenth Semester</i>	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Engineering Program	3
	—
	15

+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.

\*The University degree requirement is one course in literature or fine arts. The College of Arts and Letters requires a minimum of one course in each subject area, plus one additional course in history or social science.

\*\*One course at the intermediate or advanced series completes the requirement. Beginning or elementary series require three semesters' work to fulfill the language requirement.

†Courses specified by the student's major engineering department. Minimum total for the five-year program to fulfill degree requirements in both colleges is 168 to 177 credit hours.

‡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



## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

sophomore year, but in some cases may start as late as the first semester of the junior year.

Students in the College of Arts and Letters, contact education advisor Stuart Greene for more information and help with planning. Students in the College of Science, contact Dr. Kathleen Cannon at 574-631-5812.

## Interdisciplinary Minors within the College

During the junior and senior years, students may elect to complete one or more interdepartmental minors in addition to the departmental major sequence. Composed of 15 hours of class work chosen from at least two departments, these minors encourage students to think from an interdisciplinary perspective about a given issue or topic. Requirements for completion are determined by the faculty director in consultation with the relevant college committee. Current offerings include Catholic Social Tradition; Education, Schooling, and Society; Gender Studies; Hesburgh Program in Public Service; Journalism, Ethics, and Democracy; Latino Studies; Medieval Studies; Peace Studies; Philosophy and Literature; Philosophy, Politics, and Economics; Philosophy Within the Catholic Tradition; Religion and Literature; and Science, Technology, and Values. These were formerly called concentrations and are described in detail below.

### CATHOLIC SOCIAL TRADITION

*Co-Directors:*

Bill Purcell; Todd David Whitmore

The Minor in Catholic Social Tradition is an interdisciplinary minor that serves as a resource for Notre Dame undergraduates to learn Catholicism's social tradition.

Catholicism offers a long-standing and profound tradition of thought and teaching that addresses, from a normative standpoint, the full range of social spheres. Such concepts include those of solidarity, the common good, the just wage, human rights, the free economy, subsidiarity, and the option for the poor.

Sources for the tradition go back as far as the Bible and develop even in the early church fathers. Pope Leo XIII inaugurates Catholicism's effort to bring its social tradition to bear on industrial society in his 1891 encyclical, *Rerum Novarum* (The Condition of Labor). Since then, popes have drawn upon *Rerum Novarum* and the social tradition to broaden and develop Leo's set of concerns in encyclicals often titled—as with Pius XII's *Quadragesimo Anno*, Paul VI's *Octogesima Adveniens*, and John Paul II's 1991 *Centesimus Annus*—in accordance with their relationship to the earlier document. In doing so, the popes and the Second Vatican Council have addressed issues ranging across all spheres of social life from the family to the state to the church. The U.S. bishops have made sophisticated application of

these teachings to the specific circumstances of the United States.

Unfortunately, many Catholics are unaware of this tradition. Pope John Paul II writes, "It must be asked how many Christians really know and put into practice the principles of the church's social doctrine." The U.S. bishops concur. While "Catholic social teaching is a central and essential element of our faith," it is still the case that "our social heritage is unknown by many Catholics." At the same time, graduates of Notre Dame move on to assume leadership positions, often quite advanced ones, in a broad spectrum of social spheres, including in politics, law, business, education, the media, and the military. The Catholic Social Tradition minor serves as a resource for Notre Dame undergraduates to learn the tradition so that it can inform life both before and after graduation.

The Minor in Catholic Social Tradition involves 15 credit hours of course work, including a core course (3 credits), two electives (each three credits), three one-credit colloquia/social concerns seminars, and a senior capstone course.

**Contact:** Prof. Todd David Whitmore at [Whitmore.1@nd.edu](mailto:Whitmore.1@nd.edu), or Prof. Bill Purcell at [wpurcell@nd.edu](mailto:wpurcell@nd.edu).

### COURSE DESCRIPTIONS

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Catholic Social Tradition*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

### CONSTITUTIONAL STUDIES

*Director:*

Vincent Phillip Muñoz  
([vmunoz@nd.edu](mailto:vmunoz@nd.edu)/574-631-0489)

*Program Assistant:*

Jennifer Smith  
([jsmith70@nd.edu](mailto:jsmith70@nd.edu)/574-631-5351)

*Program Website:*

[www.constudies.nd.edu](http://www.constudies.nd.edu)

*This new minor is scheduled to begin enrolling students in the Fall 2012 semester. Students interested in the Constitutional Studies minor should consider enrolling in CNST 50001 (POLS 30661) Constitutionalism, Law & Politics, the minor's gateway class, which is scheduled to be offered in Fall 2013.*

Nothing has done more for justice in the modern world than the development of the rule of law under constitutional principles. But for constitutional governments to secure the common good, thoughtful and educated citizens must possess certain virtues: they must understand and be able to implement, defend, and, if need be, reform constitutional institutions. The Constitutional Studies minor seeks

to nurture such citizens, thereby contributing to the University's mission to pursue truth and to nurture a concern for the common good, that will bear fruit as learning becomes service to justice.

Building on courses across the College of Arts and Letters and the Law School, the Constitutional Studies minor is designed to encourage students to confront fundamental questions concerning justice, the rule of law, and human flourishing. From a variety of historical, cultural, disciplinary, and philosophical perspectives, constitutional studies courses ask questions such as:

- What is the proper relationship between government and civil society; between law and moral principles?
- What are the philosophical foundations of human rights and constitutional democracy?
- What principles of justice can or should lie at the foundation of a constitutional republic?
- What are the proper relationships between church and state and religion and politics, and how do these relationships reflect the more basic relationship between faith and reason?
- What are the moral, social, and political conditions necessary to sustain America's experiment in constitutional government?
- What is the nature of international law and how are international norms created and maintained?

Constitutional Studies minors receive invitations to participate in extracurricular events associated with the Potenzianni Program in Constitutional Studies, the Tocqueville Program for Inquiry into Religion and Public Life and the Law School's Program in Constitutional Structure.

### Constitutional Studies Minor Requirements:

The Constitutional Studies minor requires 15 credit hours of class work. Students must complete:

- The minor's gateway course, CNST 50001 (POLS 30661) "Constitutionalism, Law, and Politics" (3 credit hours), which addresses core topics in constitutional studies, such as, the history and philosophy of constitutional government and human rights and contemporary constitutional issues in American and international law.
- Three elective courses (total of 9 credit hours)
- Capstone experience (3 credit hours)

The elective courses are grouped into the following clusters:

- Constitutionalism: History and Philosophy
- The American Founding and American Constitutional History
- Constitutional Government and Public Policy
- Comparative Constitutionalism and International Law

These categories focus on the great political and constitutional debates in American and world history and on the underlying principles of constitutional government—natural and civil rights, social contract theory, the market economy, voluntary associations,

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

separation of powers, popular sovereignty, and the rule of law. Elective courses that count for the Constitutional Studies minor for current and past semesters are listed on the minor's website ([www.constudies.nd.edu](http://www.constudies.nd.edu)).

### TENTATIVE COURSES IN THE CONSTITUTIONAL STUDIES MINOR CLUSTERS

#### CONSTITUTIONALISM: HISTORY AND PHILOSOPHY

ARCH 34223. Seeing Power in Rome:  
Exploring the Pagan, Christian, and  
Modern City  
CLAS 30110. Democracy and the Greeks  
CLAS 30210. Roman Law and Governance  
CLAS 30214. Cicero and Political Tradition  
CLAS 40340. The Roman Empire:  
Governance, Society and Culture  
CLLA 30014. Cicero's Speeches  
CST 20209. Political Theology  
ENGL 402444. Shakespeare and Political  
Theory  
HIST 30221. Democracy and the Greeks  
HIST 30231. Roman Law and Governance  
LAW 70834 & 70843. Morality and the Law  
LAW 70844 & 73844. Faith, Morality, and  
Law  
PHIL 20407. Classics of Political and  
Constitutional Theory  
PHIL 20408. Philosophy of Law  
PHIL 20425. Contemporary Political  
Philosophy  
PHIL 43148. Aquinas on Virtue and Law  
PHIL 43401. Political Liberalism  
PHIL 43430. Moral Foundations of  
Democracy  
PLS 30302. Political and Constitutional  
Theory: Ancient and Modern  
POLS 30601. Ancient and Medieval Theory  
POLS 30610. The Enlightenment and Its  
Revolutions  
POLS 30620. Modern Political Thought  
POLS 30656. Human Rights and Human  
Wrongs  
POLS 30727. Theories of Law  
POLS 30732. Theories of Federalism  
POLS 30755. Christianity and the Modern  
State  
POLS 40061. Constitutional Interpretation  
POLS 40632. Contemporary Liberal Theory  
THEO 20601. Political Theology in the Bible  
and Christian Tradition  
THEO 40825. God, Philosophy, and Politics

#### CONSTITUTIONAL GOVERNMENT AND PUBLIC POLICY

AFST 27600. U.S. Civil Rights Movement  
AMST 30177. Civil Rights and Protest  
Movements  
CST 20302. War, Law, and Ethics  
ECON 40570. Economics of the Law  
ESS 30605/POLS 30154 – Education Law  
and Policy  
ENGL 40615. Conflict and Democracy in  
Classic American Literature  
LAW 70314. Legislation  
LAW 70317. Local Government Law  
LAW 70369. Election Law  
LAW 70318. Legislation and Regulation  
LAW 70835. Catholic Social Thought

LAW 73311. Judicial Process Seminar  
LAW 73370. Statutory Interpretation Seminar  
LAW 73828 & 74828. Bioethics and the Law  
PHIL 43314. Abortion, Euthanasia, and  
Capital Punishment  
POLS 33001. Sophomore Seminar: Law,  
Morality and Democracy  
POLS 40064. Race and the Constitution  
SOC 40701. Sociology of Law

#### THE AMERICAN FOUNDING AND AMERICAN CONSTITUTIONAL HISTORY

AFST 30202. African-American History II:  
Since 1865  
AMST 30323. American Legal History  
HIST 13195. American Political Traditions  
Since 1865  
HIST 10600. U.S History I: to 1877  
HIST 10605. U.S History Since 1877  
LAW 70304. Freedom of Religion  
LAW 70305. Constitutional Law II  
LAW 70307. Freedom of Speech  
LAW 70359. Constitutional Criminal  
Procedure  
LAW 70372. Federalism  
LAW 70452. Constitutional Criminal  
Procedure—Investigations  
POLS 30060. Constitutional Law  
POLS 30062. Civil Liberties and Civil Rights  
POLS 30064. Constitutional Rights  
POLS 30615. American Political Thought  
POLS 40074. Civil Liberties  
POLS 40617. The Constitutional Convention

#### COMPARATIVE CONSTITUTIONALISM AND INTERNATIONAL LAW

ASIA 30301. Human Rights in the Age of  
Terrorism: The View from South Asia  
CST 20302. War, Law, and Ethics  
GSC 30430. Islam and Modernity  
HIST 30075. Muhammad and the Qur'an  
HIST 30189. South Asia: Colonialism and  
Nationalism  
LAW 70401. International Law  
LAW 70407. Comparative Legal Traditions  
LAW 73449. Comparative Constitutional Law  
LAST 30311. Law and Democracy in Latin  
America  
PHIL 30406. Human Rights and Global  
Justice  
POLS 30220. International Law  
POLS 30221. International Law and  
International Relations  
POLS 30405. Law and Democracy in Latin  
America  
SOC 33510. Civil Life and Democracy in the  
Contemporary World  
THEO 40614. Ethics, Law and International  
Conflict

#### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Constitutional Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

#### EDUCATION, SCHOOLING, AND SOCIETY

The primary goal of this interdisciplinary minor is to help students acquire different and diverse perspectives on important questions in education. Education is a complex and challenging aspect of human experience. It is one of the central, shared experiences of people in contemporary societies in the United States and around the world. 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.

Most societies rely on education to bring about fundamental changes in students and in society. The minor in Education, Schooling and Society (ESS) uses the tools and resources of a liberal arts perspective to help students reflect on, understand, research, and influence the role of education in society. In addition, the program will provide a rich body of resources for students who may want to pursue careers in education after graduation, including teaching, research, working for non-profits, or policy making.

Normally, students apply for admission to the minor late in their freshman year or early in their sophomore year, and this is ideal. Students should be in good academic standing and demonstrate a strong interest in issues related to the causes and consequences of learning, schooling, and educational policy.

The minor in ESS involves 15 hours of course work. The introductory course in the program is ESS 33600. This course must be completed by the second semester of the junior year. At the middle level of the program, students will select three courses from a set of approved courses: two that focus exclusively on educational issues and one that includes education as one of several course foci. Students complete a capstone project as part of the minor. This requirement may be met in one of three ways: (1) participation in the Senior Research Seminar, ESS 43640, in the fall semester of the senior year; (2) a thesis in ESS (includes an approval process and a pre-requisite of at least 2 credits of ESS 47602 Research Lab); or (3) a thesis in the major department that incorporates the study of an educational issue into the research question (includes an approval process and second reader from the IEI Fellows list). Students who choose the thesis in the major department are required to take an additional ESS elective to satisfy the 15-credit requirement of the minor. 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 will design and execute an original research project and write a paper of 25–40 pages, depending on the option they choose. This process is writing intensive, requiring drafts, revisions, peer review when appropriate, and individual consultations between the professor and student.

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

The faculty work closely with students on postgraduate planning, including employment, graduate or professional school, or service opportunities.

**Director:** Prof. Nicole McNeil, Phone: 574-631-5678

**Person to see:** Prof. Maria McKenna, Phone: 574-631-0452; Ann Berends, Phone: 574-631-1672, 100S Carole Sandner Hall, E-mail: [a.berends@nd.edu](mailto:a.berends@nd.edu)

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Education, School and Society*. Course descriptions can be found by clicking on the subject code and course number in the search results.

### HESBURGH PROGRAM IN PUBLIC SERVICE

*Director:*

Martine De Ridder

The Hesburgh Program in Public Service prepares Notre Dame students for a life of active and effective citizenship as well as for the possibility of careers in public service. The program honors the principled, dedicated leadership and public service of Notre Dame's President Emeritus, Rev. Theodore Hesburgh, C.S.C.

The health of American society is closely related to good public policy, competent, ethical public service, and leadership. Thus, awareness of public policy and public service is not only the foundation for public-sector careers, but it is also a necessity for those who will exercise leadership roles in the nonprofit sector or in the private sector and seek to be knowledgeable citizens.

The Hesburgh Program offers an interdisciplinary curriculum in public policy designed to inform students about the dimensions of policy making, public administration and policy evaluation, and to develop skills in research, sensitivity to ethical issues, and appreciation for the character and limits of constitutional democracy.

First-year students and sophomores of all colleges are invited to apply to the interdisciplinary minor, as well as first semester junior transfers. To be admitted, students will need to be in good academic standing and demonstrate a strong interest in public policy and public service. An Introduction to American Politics (POLS 10100, 20100, or equivalent) and an Introduction to Economics (ECON 10011, 20011, or equivalent) are prerequisites to the Hesburgh Program course of study. To be admitted, students should have completed or be in the process of completing these requirements. A conditional admit may be granted to allow for completion of the prerequisites during a student's sophomore year of studies.

The public policy minor involves 15 hours of course work. The "gateway" course to the program is HESB 20010, Introduction to Public Policy, normally taken in the second semester of the sophomore year. As sophomores and juniors, Hesburgh minors choose three electives drawn from each of three categories of courses approved by the program. These are research skills, values, and institutions and processes. During the senior year, students who have been on a summer internship will register for the research seminar, HESB 43020, that builds on their field experience. Other students will take one of several senior-level policy seminars identified by the program each semester.

Many of our courses are offered through cross-listings with various Arts and Letters Departments such as American Studies, Anthropology, Computer Applications, Economics and Policy Studies, History, Philosophy, Psychology, Political Science, Sociology, and Theology.

The Hesburgh Program offers students the opportunity for summer internships in public policy contexts through the Gary Lyman Internships in Public Service. In the fall of their junior year, Hesburgh students are encouraged to apply for the Lyman Internship. Students selected as Lyman interns are aided by the program's director in securing policy appropriate internships in Washington, D.C., or state and local level. Lyman interns receive financial help to defray their cost of living while interning.

During the course of the academic year, the Hesburgh Program sponsors student public-policy-related forums and activities and campus visits to Notre Dame by public figures. The staff works closely with students on postgraduate planning, including employment, professional schools such as law and public policy and academic graduate programs.

For more information, visit our website at [nd.edu/~hesprg/](http://nd.edu/~hesprg/).

**Person to see:** Dr. Martine De Ridder, Director Hesburgh Program in Public Service  
E-mail address: [Martine.M.DeRidder.1@nd.edu](mailto:Martine.M.DeRidder.1@nd.edu).

### PREREQUISITES

ECON 10010 or 20010 or 20011. Principles of Micro Economics  
HESB 20000. American Politics  
HESB 20001 or POLS 20100. American Politics  
HESB 20002. Principles of Microeconomics  
HESB 20003. Economics and Public Policy Gateway Course  
HESB 20010. Introduction to Public Policy (Spring)

### RESEARCH TOOLS

HESB 30015. Analyzing Public Policy  
HESB 30100. Methods of Sociological Research.  
HESB 30101. Statistics for Social Research  
HESB 30102. Intermediate Micro Theory  
HESB 30103. Quantitative Political Analysis  
HESB 30104. Statistics for Economics

HESB 30107. Research Design & Methods  
HESB 30108. Applied Quantitative Methods

### VALUES

HESB 30207. Politics and Conscience  
HESB 20210. U.S. Latino Spirituality  
HESB 20211. Rich, Poor, and War  
HESB 20215. Medical Ethics/Biomedical Ethics  
HESB 30243. Self and Society  
HESB 30217. American Political Thought  
HESB 30218. Civil Liberties  
HESB 30222. Modern Political Thought  
HESB 30230. Religion and Social Life  
HESB 30231. Moral Problems  
HESB 30232. Morality and Modernity  
HESB 30233. Philosophy of Religion  
HESB 30234. Continental Political Thought  
HESB 30237. Medical Ethics  
HESB 30238. Philosophical Reflections on Christian Belief  
HESB 30240. Feminist Political Thought  
HESB 30241. Contemporary Political Theory  
HESB 30244. World Religions and Catholicism in Dialogue  
HESB 30245. Political Theory  
HESB 30246. Science, Technology, and Society  
HESB 30247. War, Peace, and Conscience  
HESB 30248. Catholics in America  
HESB 30251. Ecology, Ethics, and Economics  
HESB 30252. Christianity and World Religions  
HESB 30256. Human Rights and Human Wrongs  
HESB 30259. U.S. Intellectual History Since 1870  
HESB 30260. Basic Concepts in Political Philosophy  
HESB 30261. Catholicism and Politics  
HESB 30263. Ethics  
HESB 30264. Freedom and the American Novel  
HESB 30265. Constitutional Conventions  
HESB 30266. Constitutional Leadership  
HESB 30267. God, Country and Community  
HESB 30268. Science & Catholicism  
HESB 30269. Introduction to Economic & Catholic Thought  
HESB 30270. Theology, Ethics & the Environment  
HESB 30271. Twentieth-Century Ethics  
HESB 30272. Radical Politics II: Socialism  
HESB 30273. Ethics of War & Peace  
HESB 30274. Women, Gender & Theology  
HESB 30275. Philosophy of Medicine and Health Care Reform  
HESB 30276. Classics of Political and Constitutional Theory  
HESB 30277. U.S. Intellectual History Since 1870  
HESB 30278. Religion: History of an Idea  
HESB 30279. God, Science and Morality  
HESB 30280. War, Peace, Revolution

### INSTITUTIONS AND PROCESSES

HESB 30400. American Congress  
HESB 30401. Presidential Leadership  
HESB 30403. Latinos and the U.S. Political System  
HESB 30410. U.S. since WWII

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

- HESB 30421. Race/Ethnicity and American Politics  
 HESB 30422. Social Problems  
 HESB 30426. Today's Gender Roles  
 HESB 30427. American Political Parties  
 HESB 30437. Constitutional Law  
 HESB 30438. Social Movements  
 HESB 30441. Race and Ethnicity  
 HESB 30442. Home Fronts During War  
 HESB 30443. Religion in American Politics  
 HESB 30449. Constitutional Interpretation  
 HESB 30451. Leadership and Social Responsibility  
 HESB 30452. Contentious Politics and Resistance Movements  
 HESB 30456. Jacksonian U.S.: Pol/Soc/Cul  
 HESB 30457. Environmental History  
 HESB 30458. African American History II  
 HESB 30464. African-American Resistance  
 HESB 30467. Information Security  
 HESB 30472. Mexican-American History  
 HESB 30473. U.S. Foreign Policy Since 1945  
 HESB 30474. Crime, Heredity, Insanity In U.S.  
 HESB 30480. Labor and America Since 1945  
 HESB 30481. American Voting and Elections  
 HESB 30482. On War  
 HESB 30486. Introduction to Political Economy  
 HESB 30487. Population Dynamics  
 HESB 30488. The Internet and Society  
 HESB 30489. Gender Roles and Violence in Society  
 HESB 30490. International Migration and Human Rights  
 HESB 30494. Religion and American Politics  
 HESB 30496. American Men, American Women  
 HESB 30497. Great Depression  
 HESB 30499. Public Opinion and Political Behaviors  
 HESB 30501. Witnessing the Sixties  
 HESB 30508. Black Chicago Politics  
 HESB 30509. Men, Women, and Work  
 HESB 30511. The City in American Culture  
 HESB 30512. Foundations of Sociological Theory  
 HESB 30513. The U.S. in the 1960s  
 HESB 30515. Immigration in Global Perspective  
 HESB 30516. European Cultures and Societies  
 HESB 30517. Education Innovations in Diverse Contexts of Poverty  
 HESB 30518. Environmental Politics  
 HESB 30523. Time and Society  
 HESB 30524. Sociology of Law  
 HESB 30528. Law and Religion in U.S. History  
 HESB 30531. African American Politics: The End or the Beginning  
 HESB 30533. Education and Social Entrepreneurship  
 HESB 30537. International Law  
 HESB 30538. International Political Economy  
 HESB 30539. Civil Rights & Protest Movements  
 HESB 30543. American Political Life  
 HESB 30544. People, Environment, Justice  
 HESB 30545. Capital Crimes  
 HESB 30546. Representations of Urban Life  
 HESB 30547. Latinos in Chicagoland  
 HESB 30548. Race Relations & Ethnic Conflict in the U.S.  
 HESB 30549. U.S. Civil Rights History: Chicanos  
 HESB 30550. History of Science & Race  
 HESB 30551. Racialization in U.S. & Brazilian History  
 HESB 30552. Food and Agriculture Policy  
 HESB 30553. Reinventing Government  
 HESB 30554. Party Polarization in American Politics  
 HESB 30555. Public Policy & Administration in the U.S.  
 HESB 30556. American Labor Force  
 HESB 30557. American Religious History  
 HESB 30558. American Public Opinion and Voting Behavior  
 HESB 30559. Constitutional Rights  
 HESB 30560. Confronting Homelessness in American Culture and Society  
 HESB 30561. Political Economy of Globalization  
 HESB 30562. Sociology of War and Terror  
 HESB 30563. Latinos in Midterm Elections  
 HESB 30564. Global Sociology  
 HESB 30565. Education & Development in a Global Era  
 HESB 30566. American South: Race & Representations  
 HESB 30568. Education Law and Policy  
 HESB 30569. The Global Environment  
 HESB 30570. Social Inequality & American Education  
 HESB 30571. Health and the Latino Paradox  
 HESB 30572. Medicine & Public Health in U.S. History  
 HESB 30573. U.S. Foreign Policy to 1945  
 HESB 30574. U.S. Civil Rights Movement  
 HESB 30575. Law and Society  
 HESB 30576. The U.S. Since WWII  
 HESB 30577. American Legal History  
 HESB 30578. Labor History of American Food  
 HESB 30579. The United States' Gilded Age and Progressive Era  
 HESB 30580. Undocumented Immigrants  
 HESB 30581. Latinos in Education  
 HESB 30582. Immigration, Political Rights, Citizenship: New Perspectives  
 HESB 30583. Constitutionalism, Law and Politics  
 HESB 30584. History of American Education: Race, Class, Gender and Politics  
 HESB 30585. Social Inequality  
 HESB 30586. War and the U.S.  
 HESB 30587. Racism & Activism  
 HESB 30588. Urban Politics  
 HESB 30589. Stereotypes, Media and Politics  
 HESB 30590. American Consumer Culture  
 HESB 30591. Is Post-Race Politics Possible?  
 HESB 30592. Introduction to Latinos in American Society  
 HESB 30593. Race & Ethnicity: Latinos in the U.S.  
 HESB 30594. Poverty/Inequality/Social Satisfaction  
 HESB 30595. Early Childhood Policy in U.S.  
 HESB 30596. Marxian Economics  
 HESB 30597. Global Environment  
 HESB 30598. Policy Analysis in Education  
 HESB 30599. Policy, Values & Practices in Science Education  
 HESB 30600. Contemporary Thinking in Philosophy of Education  
 HESB 30601. Landscapes of Urban Education  
 HESB 30602. First Amendment  
 HESB 30603. Inequality and American Politics  
 HESB 30604. Federalism and the Constitution  
 HESB 30605. Catholicism in Contemporary America  
 HESB 30606. Social Inequality and American Education  
 HESB 30607. Labor Economics  
 HESB 30608. Tale of Two Depressions  
 HESB 30609. Interest Group Politics  
 HESB 30610. Women (& Men) in U.S. History  
 HESB 30611. Energy, Society and the Environment  
 HESB 30612. Monetary Policy  
 HESB 30613. Gender, Race and Science  
 HESB 30614. Introduction to Education Policy  
 HESB 30615. Religion, Development and Democracy  
 HESB 30616. Politics of Adapting to Climate Change  
 HESB 30618. Religion/State and the American Constitution  
 HESB 30620. Race and American Popular Culture  
 HESB 30621. Laboring Women  
 HESB 30622. Gender and Popular Culture  
 HESB 30623. School Choice Perspectives  
 HESB 30624. U.S. Latina/o History  
 HESB 40420. Current Trends in Computer Applications  
 HESB 43554. Education and Development in a Global Era
- POST-INTERNSHIP SEMINAR**  
 HESB 43020. Research Seminar in Public Policy
- CAPSTONE/SENIOR POLICY SEMINARS**  
**Four Heshburgh Program Generated Courses**  
 HESB 43040. Spending, Taxes, Deficit  
 HESB 43041. Health Care Policy  
 HESB 43042. Common Law and the Common Good  
 HESB 43043. Health Care and the Poor  
 HESB 30486. Intro to Political Economy  
 HESB 43502. Self, Society and Environment  
 HESB 43503. Race Gender and Women of Color  
 HESB 43509. Cultural Aspects of Clinical Medicine  
 HESB 43515. Families and Their Interrelation w/Gender  
 HESB 43524. Unequal America  
 HESB 43534. Sociology of Economic Life  
 HESB 43535. Crime and Deviance in Ideological Perspective  
 HESB 43537. Environmental Justice  
 HESB 43538. Bio-Medical Ethics and Public Health Risk  
 HESB 43540. International Migration and Human Rights  
 HESB 43541. Religion and American Society  
 HESB 43543. Health, Healing, and Culture

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

HESB 43544. Society, Self, and Catholic Social Tradition  
 HESB 43546. Black Politics in Multiracial America  
 HESB 43547. Controversies and Crises in Modern Criminology  
 HESB 43548. Marxian Economic Theory  
 HESB 43552. History of Economic Thought  
 HESB 43554. Education and Development in a Global Era  
 HESB 43555. Building Democratic Institutions  
 HESB 43556. Religion and Classical Social Theory  
 HESB 43558. Civil Life and Democracy in the Contemporary World  
 HESB 43559. Anthropology of Poverty  
 HESB 43560. Employment in a Changing Economy  
 HESB 43861. Political Economy of the Financial Crises  
 HESB 43862. Economics of War and Peace  
 HESB 43863. World Poverty and Inequality Across Nations  
 HESB 43864. U.S. Catholic Social Ethics  
 HESB 43865. Religion and Social Activism  
 HESB 43867. Race, Ethnicity & Inequality in Public Education  
 HESB 43868. Deviance, Crime & Social Control  
 HESB 43869. Environmental Economics  
 HESB 43870. Telling About Society  
 HESB 43871. Topics in Political Economy  
 HESB 43872. Contemporary Education Reform in America  
 HESB 43873. Sociology of Media, Technology, Society  
 HESB 43874. Family, Gender and Employment  
 HESB 43875. Power & Identity in Modern Society  
 HESB 43876. Doing Things with Words  
 HESB 43877. Culture, Morality and Society  
 HESB 43878. Law, Society and Criminal Justice in the U.S.  
 HESB 43879. Investing in Children—Public Policy & Programs  
 HESB 43880. Philosophy of Science and Public Policy  
 HESB 43881. Philosophy of Religion

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject *Hesburgh Program in Public Service*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**INTERNATIONAL DEVELOPMENT STUDIES***Director:*

Amitava Dutt

The goal of the interdisciplinary minor in International Development Studies (IDS) is to provide undergraduate students with both the opportunity to learn about and contribute to international development. Administered by the Ford Family Program in Human Development Studies and Solidarity at the Kellogg Institute for International Studies, the IDS minor provides students with context and an academic foundation to analyze the dynamics of development across the globe. Since development studies is interdisciplinary in nature, students are required to take courses in a variety of disciplines, equipping them with a broad lens through which to view and investigate development challenges. Students from all colleges and departments are encouraged to apply.

Great innovation and advancement on the one hand, and great poverty and struggle on the other, characterize the world of today. The contrast and inequality between and within countries across the globe is remarkable given the technology available and the globalized world in which we live, where goods, capital, ideas, and people flow swiftly around the planet. The University of Notre Dame is an ideal place for exploring the nexus between technological, scientific, economic, and political solutions to development as well as the deeper ethical questions of sustainability, right relationship, and solidarity.

The IDS minor prepares students for a variety of interests related to international development, including graduate work related to development studies, volunteer work, or employment in the field. Regardless of what career path IDS students follow, their transcripts will reflect a firm grounding in development issues.

*Requirements:*

A central component and requirement of the IDS minor is a field-based research project in the so-called “developing” world, allowing students to contribute to the Ford Program’s mission of seeking solutions to real-world challenges by examining the causes and consequences of extreme poverty. This research project will normally be conducted the summer after a student’s junior year.

Additionally, the minor in International Development Studies consists of 15 credit hours:

Gateway Course (3 credit hours): Introduction to International Development Studies

- This course is only offered in the fall and will normally be taken during sophomore year.

Three Electives (9 credit hours):

- Qualifying elective courses are listed each semester in the Schedule of Classes under IDS.
- At least two electives must be outside the student’s major.

- No two electives may be from the same department.
- At least two electives must be from a set of “core” development courses to be specified each semester.

Capstone Seminar (3 credit hours)

- Each student will write a senior essay based on his or her field research.
- Bringing together their unique experiences and disciplinary perspectives, minor students will discuss and critique each other’s work.

To supplement their course work, students should take advantage of the many opportunities made available by the Ford Program and the Kellogg Institute. Each semester, the Ford Program’s lecture series Discussions on Development offers a forum for students and faculty to discuss current development challenges. At the annual student-led human development conference, students from around the country and world come together to present and discuss their research on international development. Students will also be encouraged to engage the “developing” world often through overseas learning experiences, including through the Kellogg Institute’s summer research grant and internship programs.

For more complete information about the minor in International Development Studies and the Ford Program, please consult our website at [kellogg.nd.edu/ford](http://kellogg.nd.edu/ford) or contact Holly Rivers, assistant director, Kellogg Institute at [hrrivers@nd.edu](mailto:hrrivers@nd.edu)

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject *International Development Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## JOHN W. GALLIVAN PROGRAM IN JOURNALISM, ETHICS, AND DEMOCRACY

*Director:*

Robert Schmuhl

The John W. Gallivan Program in Journalism, Ethics, and Democracy offers several courses for students interested in careers in print and broadcast 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 along 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 *The Craft of Journalism*; *Advanced Reporting*; *Multimedia Journalism*; *Persuasion, Commentary, and Criticism*; *Broadcast Journalism*; and *Ethics in Journalism*.

The director of the program is Robert Schmuhl, the Walter H. Annenberg-Edmund P. Joyce Professor of American Studies and Journalism. An advisory committee of Notre Dame graduates in journalism helps guide the program. Members include Tom Bettag, producer, NBC News; Robert Costa, Washington editor, *National Review*; Bill Dwyre, sports columnist, *The Los Angeles Times*; Maddie Hanna, reporter, *The Philadelphia Inquirer*; Daniel LeDuc, senior officer and editor, The Pew Charitable Trusts; Meg Martin, associate editor, Public Insight Network at American Public Media; John McMeel, president and chairman, Andrews McMeel Universal; Anne Thompson, chief environmental affairs correspondent, NBC News; and Kelley Tuthill, reporter/anchor, WCVB-TV, Boston.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Journalism, Ethics & Democracy*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## LATINO STUDIES

*Director of Academic Program:*

Karen Richman

**Program of Studies.** The College of Arts and Letters offers a minor and a supplementary major in Latino Studies in conjunction with any undergraduate major from any college at the University.

Latino Studies centers around the study, analysis, and understanding of the varied experiences of the Latino population in the United States. Its scope is broad and it strives to incorporate various disciplines in its approach.

The Latino presence is deeply rooted in American history. In the latter half of the 19th century the numbers of Latinos in the United States grew exponentially—in the aftermath of the Mexican American War (1848), with the expansion of the American Southwest and the inclusion within U.S. borders of what had previously been Mexican territory, and the Cuban Spanish American War (1898), with the annexation of Puerto Rico. During the next century Mexicans crossed the border and Puerto Ricans traveled to the mainland to find work and, in many cases, to make their homes. The 20th century also saw waves of immigration from Cuba, the Dominican Republic, and Central and South America, a trend that continues today as the U.S. Latino population becomes increasingly diverse.

Students who pursue the minor in Latino Studies will have the opportunity to be at the forefront of the study of one of the 21st century's most significant demographic changes in the United States.

The Institute for Latino Studies is committed to scholarship that will promote critical thinking about such issues as spirituality, social action, language, race, ethnicity, class, assimilation/acculturation paradigms, and indigenous traditions, to name a few. Literary and visual arts, which often function as vehicles for social change and creative empowerment, constitute another focus of our curriculum. Overall, Latino Studies aims to strike a balance among the social sciences, humanities, and arts in its teaching, research, and service.

As the Latino diaspora evolves, so does the field of Latino Studies. Latino Studies recognizes the value of a comparative, cross-border perspective for arriving at an in-depth understanding of Latinos' historical roots and multi-ethnic heritages. It promotes research and analyses of new issues such as emerging transnational communities, changing immigration patterns, remittances, and cultural flows between Latinos in the United States and the Caribbean and South and Central America. While the emphasis is on domestic Latino communities, the discipline's focus inevitably becomes internationalized when we consider globalization, immigration, and border issues.

In addition to the teaching program, Latino minor students are exposed to the institute's research and community outreach components. In summary,

students will be able to take advantage of the resources of ILS, which also include two specialized units that conduct pioneering programs in Latino theology and spirituality.

As an interdisciplinary program, the minor in Latino Studies will complement and provide a broader cultural and social background to students in the various departments and colleges at the University. The minor is open to all undergraduate majors. Participants in the program will be prepared to work in a myriad of professional settings and to serve an increasingly diverse society.

**Minor in Latino Studies Curriculum.** The minor in Latino Studies consists of 15 credit hours, including a required gateway course (3 credits), practicum course (3 credits), and nine credit hours of elective course work. Although there is no language requirement for the minor, students are encouraged to study and acquire fluency in the Spanish language. **All Latino Studies courses are open to all students.**

### Practicum Course

(3 credit hours, required for Latino Studies minor)

In this course, usually taken during their senior year, students will complete a practicum that will include directed research/reading on an Institute project, class discussion, and experiential work in the Latino community. Students will have the option of choosing and designing a project, regardless of their major, in keeping with their interests. They will carry out the project under the direction of a faculty mentor starting in the fall semester. A written report and a class presentation will complete this academic experience. Methods and analytical frameworks will vary depending on the student and faculty advisors. The practicum could be substituted by an approved similar course.

### Elective Courses

(9 elective credit hours)

Students must take two out of three courses at the 30xxx–40xxx level unless they receive special permission from their faculty advisor. In addition, students must choose their electives from within at least two major subjects in Latino Studies, e.g., health, business, social science, theology, political science, literature, and visual arts, except for the following two cases.

Students who are pursuing Spanish language proficiency (not minor or major) may replace one elective (three credit hours) with a 20xxx-level Spanish course. Students may also replace one elective (three credit hours) from a field comparable to Latino Studies (e.g., Gender Studies, Latin American Studies, or African American Studies) as long as at least one-fourth of the course content includes Latino Studies. A list of appropriate courses will always be available for students.

### Supplementary Major in Latino Studies.

The supplementary major in Latino Studies consists of 24 credit hours, including the completion of the gateway course ILS 20701 (3 credits), senior seminar (3 credits), 12 credit hours of six Latino Studies course work, and six 6 credit hours of open electives.

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

Three of six open elective credit hours must be chosen from Latino Studies courses. The three remaining credit hours may be a Spanish language course. This open elective will give students the opportunity to further develop their Spanish language skills (non-Spanish majors only) or, with the approval of the faculty advisor in Latino Studies, they may elect a course from a field comparable to Latino Studies (e.g., Gender Studies, Latin American Studies, or Africana Studies).

Although there is no Spanish language requirement, all Latino Studies majors will be strongly encouraged to learn to speak, read, and write Spanish or strengthen their Spanish language skills as well as to participate in study abroad programs in Spanish-speaking countries.

#### Introductory “Gateway” Course

ILS 20701—3 credit hours, required for Latino Studies minor and major; open to all Notre Dame students

#### Senior Seminar in Latino Studies

(3 credit hours; required for Latino Studies supplementary major)

The senior seminar is a capstone course for the supplementary major in Latino Studies. The centerpiece of the course is a seminar paper that students research and write on a subject and discipline of their choice or possibly a topic among the institute’s research projects. The course will include directed, independent study and research with a Latino Studies faculty member resulting in a substantial and original research paper of 15 to 20 pages. The students will participate in an annual symposium where they will present their work.

#### Required Courses

(12 credit hours of 30xxx–40xxx level Latino Studies courses)

These required courses must be distributed in four major components: history, literature, social science, and theology courses.

#### Open Elective Courses

(6 credit hours)

The remaining six credit hours are considered open electives. Three credit hours must be taken from Latino Studies courses. The three remaining credit hours may be in Spanish (non-Spanish majors only) or, with the approval of the faculty advisor in Latino Studies, students may elect a course from a field comparable to Latino Studies (e.g., Gender Studies, Latin American Studies, or Africana Studies).

The following represents a sample list of courses offered in previous terms and in spring 2008:

ILS 20701. Introduction to Latinos in American Society  
 ILS 20702. Topics on Race in the Americas  
 ILS 20800. U.S. Latino Spirituality  
 ILS 20900. Spanish for Heritage Speakers  
 ILS 30xxx. Chicanas in the Visual Arts  
 ILS 30101. Caribbean Diaspora  
 ILS 30201. Latinos: Wealth, Inequality, and Asset-Building Policies

ILS 30300. Latino History  
 ILS 30302. Latino/Latina American Literature  
 ILS 30304. Border Crossings: Mexican and Canadian Literature  
 ILS 30306. Women in the Americas  
 ILS 30307. Icons and Action Figures in Latino/Latina Literature  
 ILS 30308. Latino Poetry  
 ILS 30309. The American Intersections of Latino/a Writing  
 ILS 30310. Contemporary Latino/a Caribbean Literature  
 ILS 30401. Mexican-American History  
 ILS 30703. Migration, Race, and Ethnicity in Twenty-First-Century America  
 ILS 30706. Toward Equity and Excellence in Education: A Review of Pedagogical and Policy Approaches from 1950 to Present  
 ILS 30900. Nations in Motion: Latino/Latina Literature in the United States  
 ILS 35801. Hispanic Leadership Intern Program  
 ILS 40101. Mexican Migration and Transnationalism in South Bend  
 ILS 40101. Race, Ethnicity, and Power  
 ILS 40232. Latin Film: Culture, God, and Redemption  
 ILS 40301. The Politics of Memory in Contemporary Latino/Latina Literature  
 ILS 40304. Latino Literature and Visual Culture  
 ILS 40406. Latinos and Christianity  
 ILS 40600. Latino Psychology  
 ILS 40700. International Migration: Mexican and U.S. II  
 ILS 40706. Latinos in American Society  
 ILS 40707. International Migration and Human Rights  
 ILS 40710. Aesthetics of Latino Cultural Expression  
 ILS 40712. Legacy of Exile: Cubans in the United States  
 ILS 40713. Latino Economic Development: Research and Policy  
 ILS 40714. Social Demography of the U.S. Latino Population  
 ILS 40716. Latino Religion and Public Life: Exploring the Social Impact of the Latino Church  
 ILS 40801. Theology and Popular Piety in U.S. Catholicism  
 ILS 40802. Culture, Religion, and Evangelization  
 ILS 40804. Latin Film: Culture, God, and Redemption  
 ILS 40900. New Readings in Modern Caribbean Literature  
 ILS 40901. Cuban Literature

#### COURSE DESCRIPTIONS

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

#### LITURGICAL MUSIC MINISTRY

This 18-credit minor consists of three 3-credit courses in theology and two 3-credit courses in music, plus 3 credits of music lessons or approved ensembles, to be selected in consultation with the student’s music advisor. Contact the director of undergraduate studies in the Department of Theology.

#### MEDIEVAL STUDIES

The Minor in Medieval Studies allows students who are committed to other programs of study to pursue interests in the culture of the Middle Ages and to cross the limits of individual disciplines as a means of understanding the changing social, economic, legal, intellectual, and artistic systems of medieval society.

Students may declare their intention to undertake a minor in Medieval Studies to the director of undergraduate studies at any time before the end of their third year. The undergraduate director will then act as their minor advisor and help them select a set of courses that form a coherent program of study, often in conjunction with their major if possible. Students are required to take five courses, including the introductory course, *The World of the Middle Ages*, and three or four electives in Medieval Studies drawn from at least two of the 12 affiliated departments: (Anthropology; Art, Art History, and Design; Classics; English; German and Russian Languages and Literatures; History; Irish Language and Literature; Music; Philosophy; Political Science; Romance Languages and Literatures; and Theology). The Medieval Studies Advanced Seminar (3 credits) is recommended as one of the five courses, in lieu of a medieval elective, on a space-available basis. Courses counted toward a student’s major may not be used for the minor.

#### COURSE DESCRIPTIONS

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

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

**PEACE STUDIES**

*Director of Undergraduate Studies:*

George A. Lopez

*Undergraduate Program Manager:*

Anna Van Overberghe

**Program of Studies.** Peace Studies is defined as the interdisciplinary examination of the conditions that make for peace. It also investigates the obstacles to the realization of these conditions, drawing on theories and methods from diverse disciplines to focus on what makes for the development of a just and peaceful world order. Peace Studies relates scholarship to practice and challenges those who engage in it to develop new ways of thinking and acting in the world.

Notre Dame's Peace Studies program divides its curriculum of courses into three related but distinct areas:

**Area A:** The role of international norms, institutions, and states in a peaceful world order. An exploration of ways of making governmental and intergovernmental institutions more effective and representative, and of strengthening governmental compliance with fundamental norms of peace and human rights.

**Area B:** The impact of religious, philosophical, and cultural influences on peace. The study of the ethics of the use of force, theological and philosophical visions of global justice, the ways in which the world religious traditions foment violence or encourage peace, the practice of nonviolence, and the linguistic, literary, and historical dimensions of cultures of peace.

**Area C:** The promotion of social, economic, and environmental justice. The study of social change, with specific attention to the role of nongovernmental organizations, commercial enterprises, and states in fostering sustainable economic development, respect for human rights, conflict resolution and nonviolent conflict transformation, support of gender and family issues, and protection of the environment.

In both the supplementary major (24 credit hours of required course work) and in the minor (15 credit hours of required course work), students will complete an introductory course, explore the three key areas of Peace Studies, and participate in a writing-intensive integrative senior seminar.

**The Supplementary Major**

The supplementary major in Peace Studies requires completion of the introductory course in Peace Studies (three credit hours), one course in each of the three areas of study (nine credit hours), three elective courses in Peace Studies (nine credit hours), and the writing-intensive senior seminar (three credit hours). The program for a supplementary major in Peace Studies follows.

IIPS 30101 Introduction to Peace Studies

Area A one course from list

Area B one course from list

Area C one course from list

[elective]

[elective]

[elective]

IIPS 43101 Senior Seminar

**The Minor**

The minor in Peace Studies requires completion of the introductory course in Peace Studies (three credit hours), one course in each of the three areas of study (nine credit hours), and the writing-intensive senior seminar (three credit hours). The program for a minor in Peace Studies follows.

IIPS 30101 Introduction to Peace Studies

Area A one course from list

Area B one course from list

Area C one course from list

IIPS 43101 Senior Seminar

Electives for the supplementary major may be taken from IIPS electives or any course from Areas A, B, or C.

An alphabetical list of courses by area is available on the Kroc Institute website: <http://kroc.nd.edu/undergraduate/courses-and-curriculum>.

**COURSE DESCRIPTIONS**

**All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Institute for International Peace Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.**

**Information on Peace Studies.** Peace Studies at Notre Dame is centered in the Kroc Institute for International Peace Studies (in the Hesburgh Center for International Studies). Information on courses available each semester, faculty fellows in Peace Studies, and ongoing activities in Peace Studies can be found on the institute's website, [kroc.nd.edu](http://kroc.nd.edu).

**PHILOSOPHY, RELIGION, AND LITERATURE**

*Director:*

Henry Weinfeld

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. A Gateway seminar in each track is offered each academic year, one in the fall, the other in the spring. 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 advisor 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



## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

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.

For further information, contact Prof. Henry Weinfeld, Program of Liberal Studies, [hweinfic@nd.edu](mailto:hweinfic@nd.edu)

### 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 and to write senior theses. 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 PPE minor are majors in philosophy, political science or economics and the vast majority granted admission to the seminar are PPE-intents. But 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 the two fields outside the student's first major, with at least one course in both non-major fields. (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, 330 Malloy Hall, [weithman.1@nd.edu](mailto:weithman.1@nd.edu).

### PHILOSOPHY WITHIN THE CATHOLIC TRADITION

*Director:*

John O'Callaghan, Philosophy

This minor is only open to undergraduates who are majors in either philosophy or theology and who wish to add to their knowledge of philosophy and theology an understanding of what the distinctively Catholic tradition in philosophy is. It is unlike most interdisciplinary minors in being restricted in this way; work in this minor presupposes a background of some significant work in either philosophy or theology. A central task assigned to philosophy within the Catholic tradition has been that of understanding the relationship of theology to the secular disciplines, so that the relevance both of theology to these disciplines and of those disciplines to theology becomes clear. In this minor, political science will be the secular discipline whose relationship with theology provides a subject for philosophical enquiry.

The Catholic philosophical tradition is one of debate and constructive disagreement and the philosophers whom it will be possible to study in satisfying the requirements for this minor will include thinkers of very different standpoints: Augustine, Anselm, Aquinas, Pascal, Arnauld, Newman, Edith Stein and others. Because these thinkers have in common an allegiance to the Catholic faith, they agree in rejecting philosophical positions incompatible with that faith. But they also disagree with each other and in both cases what matters is the quality of their philosophical arguments.

The requirements of the minor are satisfied by taking 15 credit hours, beginning with Philosophy 30328, Body, Soul and the Image of God. Students have to take two appropriate courses in political science and one course on a major Catholic philosopher or set of Catholic philosophers, either in the Theology Department or in the Philosophy Department. No course can count both as satisfying one of the requirements for the student's major and as satisfying one of the requirements of this minor. All students are required to take a capstone seminar in which the question of what part philosophy can play in the integration of the secular disciplines with theology will be addressed through discussion of texts and arguments encountered in earlier courses. Lists of philosophy, theology, and political science courses that will satisfy the requirements of the minor will be available each semester from the director. For further information, please contact the director, Prof. John O'Callaghan.

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

**POVERTY STUDIES***Director:*

Jennifer Warlick

*Co-Director:*

Connie Mick

*Affiliated Faculty:*

Megan Andrew, Sociology

Mary Beckman, Center for Social Concerns &amp; Economics

Frank Belatti, Mendoza College of Business

David Betson, Hesburgh Program in Public Service

Catherine Bolten, Anthropology

Jay Brandenberger, Center for Social Concerns and Psychology

John Borkowski, Psychology

Kasey Buckles, Economics

William Carbonaro, Sociology

Jessica Collett, Sociology

Brian Collier, Alliance for Catholic Education

Cynthia Duarte, Institute for Latino Studies

Amitava Dutt, Political Science

Benedict Giomo, American Studies

Judy Fox, Law School

Malcolm Fraser, Biology

Dan Graff, History

Ines Jindra, Anthropology

Michael Ines, Anthropology

Kwan Kim, Kellogg Institute

Mary Ellen Konieczny, Sociology

Charles Kulpa, Biology

William Leahy, Economics

Shaun Lee, Biological Sciences

William Lies, Political Science

Neil Lobo, Biological Sciences

Elizabeth McClintock, Sociology

Sean McGraw, C.S.C., Political Science

Maria McKenna, Africana Studies &amp; Institute for Educational Initiatives

Jessica McManus Warnell, Management

Connie Snyder Mick, Center for Social Concerns

Christopher Morrissey, Political Science

Rahul Oka, Anthropology

Irene Park, Psychology

Melissa Paulsen, Gigot Center for

Entrepreneurial Studies

Margaret Pfeil, Theology

Richard Pierce, Africana Studies

Ann Marie Power, Sociology

Linda Przybyszewski, History

Steve Reifensberg, Kellogg Institute &amp; Political Science

Luc Reydam, "Political Science, Kroc Institute, Nanovic Institute"

Karen Richman, Anthropology

Jennifer Robichaud, Biology

Marc Rodriguez, History

Deondra Rose, Political Science

Jason Ruiz, American Studies

Valerie Sayers, English

Robert Sedlack, Graphic Design

David Severson, Biology

Susan Sharpe, Law School &amp; Center for Social Concerns

Kristin Shrader-Frechette, Philosophy

Joshua Shrout, Civil Engineering and Geological Sciences

David Sikkink, Sociology

Naunihal Singh, Political Science

James Sullivan, Economics and Econometrics

Erika Summers-Effler, Sociology

Kathy Taylor, Eck Institute for Global Health

Jennifer Warlick, Poverty Studies

Michelle Whaley, Biological Sciences

Sophie White, American Studies

Todd Whitmore, Theology

Charles Wilber, Economics

Richard Williams, Sociology

Abigail Wozniak, Economics

Martin Wolfson, Higgins Labor Studies Program

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

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

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

**Requirements.** An interdisciplinary minor in Poverty Studies consists of 15 or 16 credit hours, including a required gateway course (3 credits); experiential learning, depending on the option chosen (service learning, community-based research, or immersion); elective coursework selected from a list of courses approved by the director on the advice of the affiliated faculty; and senior capstone seminar or special studies/senior thesis.

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

**Experiential learning (3 credits).** The experiential learning requirement is designed to get students

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

- three designated 1-credit Center for Social Concerns seminars combined with PS 30001; or
- three credits of internship(s) with community agencies and organizations serving the poor; or
- one approved 3-credit community-based learning research course.

**Three 1-credit seminars offered by the Center for Social Concerns.** Participating in CSC seminars is a well-established tradition among Notre Dame students. PSIM students may satisfy the experiential learning requirements by bundling three Center for Social Concerns 1-credit experiential learning seminars with PS 30001. When choosing this option, students must take the Urban Plunge Seminar (THEO 33963/CSC 33963), the Appalachia Seminar (THEO 33950/CSC 33950), and one of the following:

**Fall Social Concerns Seminars with Poverty Focus**

- **Appalachia** (CSC 33950/THEO 33950/CST 33590) [Required, either fall or spring]
- Sustainable Development (CSC 33951/THEO 33951)
- Latino Community Organizing Against Violence (CSC 33959/ILS 33959/THEO 33959)
- Energy Policy, the Environment, and Social Change (CSC 33985)

**Winter Social Concerns Seminars with Poverty Focus**

- **The Church and Social Action ("Urban Plunge")** (CSC 33963/CST 33963/THEO 33963) [Required]
- Organizing, Power and Hope (CSC 33965/CST 33965/THEO 33965)
- Border Issues (CSC 33966/ILS 30804/THEO 33966)
- Urban Poverty and Homelessness (CSC 33978)
- Global Health Seminar (CSC 33995/THEO 33995)

**Spring Social Concerns Seminars with Poverty Focus**

- **Appalachia** (CSC 33950/CST 33950/THEO 33950) [Required, either fall or spring]
- Youth, Risk & Resilience (CSC 23090/PSY 23090)
- U.S. Healthcare Policy and Poverty (CSC 33951/CST 33951/THEO 33951)
- Leadership Through Solidarity (CSC 33954/CST 33954/THEO 33954)

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

- Migrant Experience (CSC 33967/CST 33967/ ILS 33967/THEO 33967)

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

**One 3-credit community-based research course/project.** This requirement may be fulfilled during the academic year satisfactorily by completing a regularly scheduled course with a community-based research component, or by participating in a summer service-learning project sponsored by the Center for Social Concerns, or by completing a Shepherd Program summer internship enhanced by the addition of an academic component similar to CSC's summer service-learning courses.

**Electives (6 credits).** Two 3xxx- or 4xxx-level courses from the list of approved Poverty Studies minor electives. See <http://povertystudies.nd.edu>.

**Capstone Experiences (3 credits).** As the final step in the PSIM, students may choose either to enroll in the capstone seminar or to undertake a 3-credit special studies project directed by one of the affiliated faculty.

**Capstone Seminar (3 credits).** The capstone seminar is topic-oriented drawing on literature from multiple disciplines. The students will be from different majors and will share the perspectives of their major disciplines as well as their varied experiences in the field, thus ensuring the interdisciplinary nature of the inquiry. Experts with diverse perspectives and professional experiences will join the seminar as special guests.

**Special studies capstone option (3 credits).** Students may also opt for research or other intellectual experience by enrolling in special studies with one of the minor's affiliated faculty. In this case, the students will produce a project (manuscript, work of art, composition, poster board display of research results, etc.) and will present this project to the members of PSIM at a special colloquium held in the spring semester of each academic year.

## COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Poverty Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## SCIENCE, TECHNOLOGY, AND VALUES

### Chair:

Gerald McKenney, Walton Professor of Theology

### Acting Director:

Edward Jurkowitz, Assistant Director for Education; Assistant Director, History and Philosophy of Science Program, The John J. Reilly Center for Science, Technology and Values, University of Notre Dame; Special Professional faculty, or Lecturer

### Affiliated faculty:

#### Chairholders:

Michael J. Crowe, Program of Liberal Studies and History (concurrent); Rev. John J. Cavanaugh Chair (emeritus)  
Katherine Brading, William J. and Dorothy K. O'Neill Collegiate Professor of Philosophy, Department of Philosophy; Director, History and Philosophy of Science Graduate Program  
Gerald McKenney, Walton Professor of Theology  
Kristin Shrader-Frechette, Philosophy and Biology; O'Neill Family Chair

#### Professors:

Ani Aprahemian, Physics  
Anjan Chakravartty, Philosophy  
Celia Deane-Drummond, Theology  
Michael DePaul, Philosophy  
Dennis Doordan, Architecture  
Christopher Fox, English  
Eugene Halton, Sociology  
Christopher Hamlin, History  
Don Howard, Philosophy  
Dian Murray, History  
Thomas Schlereth, American Studies  
Phillip Sloan, Program of Liberal Studies and History (concurrent; emeritus)  
James Sterba, Philosophy  
Andrew Weigert, Sociology

#### Associate Professors:

Matthew Ashley, Theology  
Anne Coleman, American Studies  
Jon T. Coleman, History  
Janet Kourany, Philosophy  
David Ladouceur, Classics  
Linda Przbyszewski, History  
Maura Ryan, Theology  
David Solomon, Philosophy  
Leopold Stubenberg, Philosophy  
Julia Adeney Thomas, History  
Robert Wolosin, Anthropology (adjunct)

#### Assistant Professors:

Grant Ramsey, Philosophy  
Vania Smith-Oka, Anthropology  
Michelle Whafley, Biology, Teaching Professor

Science and technology are pivotal forces in modern society and play key roles in shaping cultural sensibilities in the modern world. Indeed, our technologies are reflected in our institutions, our work, our expectations, even in our moral problems. Science, Technology, and Values (STV) is an interdisciplinary minor within which faculty and students from a variety of disciplines and different

colleges can reflectively explore the nature of science and technology as human enterprises, interacting in complex ways with our values and social institutions.

The program helps sponsor a wide range of cross-listed courses taught by faculty representing the humanities, the social sciences and the natural sciences. Students electing an STV minor can focus their work on areas of particular interest, such as science, technology and public policy; ethics, ecology and environment; medical ethics; ethical issues in science and technology; humanistic and social aspects of medicine; science and technology as cultural phenomena; history and philosophy of technology.

Students electing a minor in STV must take at least five courses (15 hours) from among those offered under the sponsorship of the STV program. These must include the core course (STV 20556). Students are urged to satisfy this requirement early in the program. At least one course also must be taken from each of clusters one, two, and three below, and either one additional course from these clusters, or from the elective list in Cluster Four. Nearly all STV courses are cross-listed.

## CORE COURSE

20556. Science, Technology and Society

## CLUSTER ONE: HUMAN DIMENSIONS OF SCIENCE AND TECHNOLOGY

20103. Death and Dying  
20115. Gender, Politics, and Evolution  
20120. Alcohol and Drugs  
20124. Memoirs of Madness  
20125. Philosophy and Science Fiction  
20134. The Technological American  
20139. Minds, Brains, and Persons  
20142. Architectural History II  
20146. History of Communications Technologies  
20149. Environmental Philosophy  
20152. Visual America II  
20154. Modern Physics and Moral Responsibility  
20160. Literature and Ecology  
20163. Science and Religion  
20179. Science and Theology  
30102. Foundations of Sociological Theory  
30106. History of Economic Modern Thought  
30107. American Intellectual History to 1870  
30110. Health, Healing, and Culture  
30113. Classical Origins of Medical Terminology  
30121. History of the Medical Science  
30132. Environmental History  
30138. American Frontiers  
30142. History of Ancient Medicine  
30146. History of Communication Technologies  
30152. History of Western Medicine  
30153. History of Psychiatry  
30154. Gender and Science  
30155. History of Photography to WWII  
30157. Introduction to the Philosophy of Biology  
34162. History of Science and Technology in Britain (taught in London only)  
30174. American Wilderness

## INTERDISCIPLINARY MINORS WITHIN THE COLLEGE

30175. Environmental History  
 30181. Science and Medicine in the Islamic World  
 30189. Philosophical Issues in Physics  
 30900. Foundations Sociological Theory  
 30902. Methods of Sociological Research  
 33195. Technology and Social Change  
 40111. Molecular Revolution  
 40112. Molecular Revolution in Biology  
 40113. Computer as Social Phenomenon  
 40118. Witchcraft and Occult 1400–1700.  
 40119. Monsters, Cyborgs, and Other Created Bodies  
 40126. Philosophy of Cognitive Science  
 40130. Crime, Heredity, Insanity in the U.S.  
 40135. Philosophy of Science  
 40140. Science and Social Values  
 40144. Religion and Science  
 40147. History/Design: Form, Values, and Technology  
 40151. Psychology and Medicine  
 40152. History of Medicine to 1700  
 40153. Visits to Bedlam  
 40154. Cultural Aspects of Clinical Medicine  
 40155. Christ and Prometheus: Evaluation/Technology  
 40157. Philosophy of Biology  
 40166. History of Modern Astronomy  
 40167. Global Food Systems  
 40172. History of Chinese Medicine  
 40174. Philosophy and Psychiatry  
 40181. Philosophy of Human Biology  
 40186. Medicine in Modern History  
 40187. Technology in History  
 40194. Building America  
 40700. The Culture of Portable Media  
 43110. Sociology of Media, Technology & Society  
 43111. The Life and Works of Darwin  
 43134. Addiction, Science, and Values  
 43136. Nature in America  
 43169. Darwinian Revolution  
 43171. History and Conceptual Foundations of Space/Time  
 50421. Architecture of the Twentieth Century  
 53421. Nature and the Built Environment  
 53451. American Towns and Cities

**CLUSTER TWO: SCIENCE, TECHNOLOGY, AND ETHICS**

20216. Biomedical Ethics and Public Health Risk  
 20221. Biomedical Ethics  
 20228. Ethics of Emerging Weapon Technology  
 20233. Robot Ethics  
 20245. Medical Ethics  
 20247. Environmental Ethics  
 20248. Modern Science and Human Values  
 20258. Philosophy of Technology  
 20260. Theology, Ethics, and the Environment  
 20263. Science Fiction and Literature  
 20282. Health Care Ethics in the 21st Century  
 20452. Ethics, Ecology, Economics and Energy  
 20629. Morality and Machines  
 30201. Introduction to Clinical Ethics  
 30225. People, Environment, and Justice  
 40175. Ethical and Professional Issues in Computer Science and Engineering

40216. Biomedical Ethics and Public Health Risk  
 40853. Science, Faith, and Reason  
 43240. Moral Development  
 43243. Ethics and Science  
 43283. Ethics and Risk  
 50245. Bioethics

**CLUSTER THREE: SCIENCE, TECHNOLOGY, AND PUBLIC POLICY**

20304. Energy and Society  
 20306. Environmental Chemistry  
 20310. Health, Medicine, and Society  
 20331. Introduction to Criminology  
 20360. Theology, Biology, & Future of Humanity  
 30311. Introduction to the American Health Care System  
 30319. Self, Society, and the Environment  
 30342. Understanding Food and Agricultural Policy  
 30382. Technology of War and Peace  
 30393. The Politics of Adapting to Climate Change  
 33370. Economics of Science  
 33401. Animal Welfare & the Human-Animal Bond  
 34366. Medical Practice and Policy UK (Taught in London)  
 40319. Self, Society, and Environment  
 40328. God, Science, and Morality  
 40357. Computers, Ethics, and Public Policy  
 40455. Water, Disease, and Global Health  
 43328. Science Policy and Politics  
 43363. Spy Culture: Surveillance, Privacy, and Society  
 43364. Technology, Privacy and Civil Liberties  
 43372. Politics of Science  
 43396. Environmental Justice  
 43410. History of Economic Thought  
 45332. Anthropology of War and Peace

**CLUSTER FOUR: OPTIONAL ELECTIVES**

20419. Brief History of Time/Space/Motion  
 20421. Writing Speculative Fiction  
 20431. Philosophy and Cosmology: A Revolution  
 20435. Ethics of Energy Conservation  
 20441. Environmental Studies  
 20461. Nuclear Warfare  
 24568. Philosophical Issues in Physics  
 30445. Technologies and Shaping of America  
 30476. Place, Environment, and Society in Australia and Melanesia  
 30986. History and Photography  
 40111. Molecular Revolution  
 40401. The Future of Energy  
 40402. Wireless Communications: The Technology and Impact of 24/7 Connectivity  
 40403. Nanotechnology: Opportunities and Challenges  
 40424. Technology and Development in History  
 40455. Water, Disease, & Global Health  
 40498. Energy and Climate  
 43400. Science, Technology, and Values in Contemporary Society  
 43409. Evolutionary Psychology and the Sacred

43414. Abortion, Euthanasia, and Capital Punishment  
 43445. The Internet—Interpretations  
 43717. Forbidden Knowledge  
 46497. Directed Readings

Because individuals attracted to the STV minor have diverse interests and differing academic backgrounds, the program advisor works closely with each student to help select courses that will complement the student's major program or be most relevant to particular career aspirations.

Contact Edward Jurkowitz, STV Program office, 442 Geddes Hall. Email: [ejurkowi@nd.edu](mailto:ejurkowi@nd.edu). Web address: [nd.edu/~stv](http://nd.edu/~stv).

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject *Science, Technology and Values*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## AREA STUDIES MINORS

## Area Studies Minors

**Program of Studies.** The College of Arts and Letters offers its students the opportunity to pursue an interdisciplinary sequence of area studies minor that may supplement the major. Currently, there are minors in African Studies, Asian Studies, Irish Studies, Latin American Studies, Mediterranean/Middle East Studies, Russian and East European Studies and West European Studies.

The purpose of these minors is to assemble the courses dealing with the language, literature, history, politics, anthropology, philosophy, sociology and economics of each area. In this way a meaningful course structure is available to students who wish to concentrate their scholarly interest upon a cultural or geographical area as well as upon an interdisciplinary approach. Such programs can be especially useful to students who plan a career in international business, international organizations or government service or who intend to do graduate work in one of these areas.

The student who wishes to complete one of the area studies minors is required to take at least four area studies courses (12 hours) distributed over three different departments. These courses must be taken in addition to those required for the major. The student must also take courses in a language of the area being studied (Russian or an East European language for the Russian Studies program; Spanish or Portuguese for the Latin American Studies program; French, German or Italian for the West European Studies program; a Mediterranean language for the Mediterranean/Middle East Studies program; Irish for the Irish Studies program; and Japanese, Korean, or Chinese for the Asian Studies program). In most cases the required number of courses will be equivalent to those required to satisfy the arts and letters language requirement, but students should check with program directors for the specific requirements of a given area. While not required to take additional language instruction for the African Studies program, students who plan to continue their African interest at the graduate level are encouraged to develop a competency in Swahili, French, Portuguese, or Arabic. In the senior year, each student must submit a satisfactory essay based upon research that combines the major discipline with the area studies curriculum.

Students interested in an area studies minor should consult the director (listed below).

### ASIAN STUDIES

*Director:*

Jonathan Nobel

The program in Asian Studies introduces students to the complexity of the continent of Asia. They 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 Center for 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 professional school such as law or business. The supplementary major and the minor in Asian Studies provide recognition of students' training in this significant region of the world.

### 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—or those who are merely curious—are well served by the Minor in Asian Studies. It provides a well-rounded introduction to the world's most populous continent. 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.

This interdisciplinary minor requires four courses in Asian Studies (12 credit hours) from at least three different departments and at least one full year of a relevant Asian language. In the senior year, students write a capstone project under the direction of a faculty member affiliated with the center and overseen by the director of the Center for Asian Studies.

Students should meet with the director of the Center for Asian Studies as early as possible in their academic career in order to plan their courses wisely. They should also meet with the director each semester to select approved courses.

#### Requirements for the Minor:

Prerequisite: One year relevant Asian language (9–10 credit hours)

- Four Asian Studies courses, from at least three different departments (12 credit hours)
- Capstone project during the senior year (3 credit hours)
- 

### COURSE DESCRIPTIONS

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

### THE MINOR IN EUROPEAN STUDIES

*Director:*

A. James McAdams

#### The Nanovic Institute for European Studies

Stretching from the Atlantic Ocean to the Ural Mountains, Europe plays a critical role in global affairs. The ongoing expansion of the European Union is helping to unite many countries and people in a traditionally diverse region. As future leaders, Notre Dame students need to know about European history, politics and culture in order to succeed in the contemporary world.

The Nanovic Institute for European Studies is committed to enriching the intellectual culture of Notre Dame by creating an integrated, interdisciplinary home for students and faculty to explore the evolving ideas, cultures, beliefs, and institutions that shape Europe today.

#### The Minor

Administered by the Nanovic Institute, the Minor in European Studies (MES) allows students to explore topics of interest and relevance in the field of European Studies. Through both coursework and independent study, students will examine the politics, history, and culture of Europe.

The program has three component requirements:

- completion of four upper-division courses from three different departments in approved areas of European Studies
- one semester of European language study beyond the College of Arts and Letters requirement (note: this applies to students in all colleges)
- a capstone thesis essay on a topic within European Studies, to be completed during the senior year

#### Other Undergraduate Support

The Nanovic Institute also administers a wide range of undergraduate grant programs. European Studies minors and other undergraduates wishing to travel to Europe to conduct research, carry out internships or service projects, or to complete other academic initiatives are encouraged to apply for support.

For more information, interested students should consult the institute's website at [nanovic.nd.edu](http://nanovic.nd.edu).

## AREA STUDIES MINORS

**IRISH STUDIES**

*Director:*

Sean O'Brien

The Keough-Naughton Institute for Irish Studies provides students with a unique opportunity to explore Ireland's extraordinary tradition in literature (in both the English and Irish languages) and distinctive historical development, including its influence on the history of the United States. The Irish Studies faculty includes leaders in several fields, including English, history, film, anthropology, and Irish language and literature. The Irish Studies Program also organizes a calendar of intellectual and cultural activities in which undergraduates are encouraged to participate; visitors to campus have included Seamus Heaney and John Hume, both Nobel Prize winners, and other leading Irish writers and public figures.

**Minor**

The core of the program is a minor in Irish Studies. The minor helps students develop their understanding of Irish society, culture, and politics through both course work and firsthand experience of Ireland. To qualify for the minor, students must (a) demonstrate proficiency in Irish language (by taking IRST 10101, 10102, and 20103); (b) complete four three-credit Irish Studies courses (mainly in the fields of history; English; Irish language and literature; sociology; politics; film, television, and theater; or anthropology), and (c) write a capstone essay in their senior year that links the minor with their major. Qualifying courses are listed in the Schedule of Classes under IRST; the list is available each semester from 422 Planner Hall.

**Dublin Program**

The home of the Dublin program is the Keough-Naughton Notre Dame Centre in O'Connell House in the historic heart of Ireland's capital. Each semester, some 35 Notre Dame students enroll for courses in the Centre and at Trinity College Dublin, University College Dublin, and the National College of Art and Design. The program includes several field trips and a variety of social and cultural activities. Students taking the Minor in Irish Studies have a distinct advantage when applying for this highly competitive program.

**Irish Internships**

The Keough-Naughton Institute for Irish Studies annually awards Keough Irish Internships, which place undergraduates in internship positions in Dublin relating to Irish politics and commerce, culture, and society. In the past, students have been placed in the Irish parliament, government departments, the Irish Film Centre, and various social service organizations. The Internships last for a period of seven weeks. Two Internships are reserved for students taking the Minor in Irish Studies.

For further information, students should consult Prof. Christopher Fox, director; telephone 631-3555.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Irish Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**LATIN AMERICAN STUDIES PROGRAM**

*Director:*

Thomas Anderson

This program promotes opportunities for students to deepen their understanding of the region through a variety of courses, campus activities, internships, and firsthand overseas learning experiences. Through the Kellogg Institute, the program offers a calendar of cultural events, summer research and internship grants, current affairs panels and regular talks on Latin America by Notre Dame faculty and visiting lecturers. In addition, the institute brings several visiting fellows each semester who are from Latin America or who specialize in the region; these fellows visit classes and meet with students.

The core of the program is a minor in Latin American Studies. The minor aims to give students well-rounded training that complements their major area of study and to make this training easily recognized on a graduating student's transcript. To qualify for the minor, students must demonstrate proficiency in Spanish or Portuguese (through two courses at the University or advanced placement), and complete four courses on Latin America that are distributed across at least three departments. During the senior year, students are required to complete high quality research through a senior essay. Students writing a senior thesis in their major department with a focus on Latin America may opt to take a fifth course in lieu of the essay.

Qualifying courses are listed each semester in the Schedule of Classes under LAST. They include courses such as Contemporary Latin American History, Economic Development of Latin America, Latin American Politics, Liberation Theology, Sociology of Development, and Spanish-American and Brazilian Literature. The program offers the John J. Kennedy Prize annually for an outstanding senior essay dealing with a Latin American topic. The summer research grants are offered through Kellogg to students after their junior year to encourage undergraduates to undertake original research on international subjects. The summer internships aim to provide undergraduates real-world experience in dealing with Latin American issues. The summer fellowships offer freshmen and sophomores the opportunity to engage in initial exploratory projects in Latin America. For more complete information about courses that qualify each semester for the minor degree, the calendar of events or the summer research and internship competitions, please consult

the LASP Web page at [kellogg.nd.edu/students/lasp](http://kellogg.nd.edu/students/lasp), or call Holly Rivers, assistant director, at 631-6023.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Latin American Studies*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**RUSSIAN AND EAST EUROPEAN STUDIES**

*Directors:*

Alyssa Gillespie and Semion Lyandres

The interdisciplinary minor in Russian and East European Studies enables students to enrich their understanding of this rapidly changing and strategically important region of the world through a robust offering of courses in language, literature, history, politics, art, anthropology, film, music, theology, and economics, while also encouraging firsthand experience of the area through study abroad during a summer or semester. Throughout the academic year, the Program in Russian and East European Studies sponsors a full slate of cultural activities—including film series and visits to musical events and art exhibits—that allow students to expand their knowledge of the region beyond the scope of their coursework. In addition, the Russian and East European Studies lecture series brings nationally and internationally renowned scholars to campus to share their latest research in fields pertinent to the minor; these lectures are tailored to the undergraduate audience and often tie in closely with courses currently being taught or program-sponsored cultural events. Russian and East European Studies cooperates closely with the Department of German and Russian, History, and other participating departments to sponsor a monthly Russian language table and a variety of social gatherings.

The core of Russian and East European Studies is the undergraduate program, which offers students the option to pursue a supplementary major or minor. These options offer students valuable interdisciplinary training in the areas of Russian and East European languages, literature, culture, history, and politics that will help them to understand this important region of the world from a variety of interrelated disciplinary perspectives.

**The Supplementary Major in Russian and East European Studies**

Supplementary majors in Russian and East European Studies must have (1) three semesters (or the equivalent) of college-level Russian or another approved East European language (this requirement may be satisfied, in whole or in part, through participation in approved summer language institutes when necessary); (2) five additional courses (15 credits) in Russian and East European area studies at the

## AREA STUDIES MINORS

30000 or 40000 level, normally taken in residence at Notre Dame across at least three departments (at most one of these courses may be a language course at the fourth-semester level or above; the counting of a language course is allowed only for a student who is not completing a major or minor in Russian); (3) three 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies; and EITHER (4) a substantial senior thesis directed by a member of the Russian and East European Studies faculty (students will receive 3 credits in the fall semester for preparation of the thesis and 3 credits in the spring semester for writing the thesis) OR (5) a sixth 3-credit course in Russian and East European area studies at the 30000 or 40000 level in any discipline (an additional advanced-level language course may satisfy this requirement only for a student not completing a major or minor in Russian) plus a one-semester senior seminar with a focus on a Russian and East European Studies topic, culminating in a senior essay. (Note: at present such seminars are offered only in the history department to history majors only; REES students not majoring in history may contact the professor for permission to enter such a course.)

#### The Minor in Russian and East European Studies (Russian Majors' Track)

This minor option is available to students making good progress toward completion of a full or supplementary major in Russian. The minor requires (1) four courses (12 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame (no more than one of the four courses may be chosen from Russian departmental offerings; language courses, including RU 40101/40102, will not satisfy this requirement); and (2) two 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies.

#### The Minor in Russian and East European Studies (History Majors' Track)

This minor option is available to students making good progress toward completion of a history major, with a concentration in Russian and East European history consisting of at least three approved courses on topics in Russian and East European history. The minor requires (1) two semesters of college-level Russian or another approved East European language (language courses satisfying this requirement may not be double-counted between a college language requirement and the REES minor); (2) two courses (6 credits) in Russian and East European area studies

at the 30000 or 40000 level, normally taken in residence at Notre Dame from offerings outside the history department; and (3) two 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies.

#### The Minor in Russian and East European Studies (Open Track)

This minor option is open to students completing any major. The open-track minor requires (1) five courses (15 credits) in Russian and East European area studies at the 30000 or 40000 level, normally taken in residence at Notre Dame and distributed across at least three departments. Up to two semesters of college-level Russian or another approved East European language may be counted as part of this requirement (however, language courses may not be double-counted between a college language requirement and the REES minor); and (2) three 1-credit courses chosen from language-across-the-curriculum tutorials associated with a Russian and East European Studies course taught in any discipline, a Research Apprenticeship in political science on a Russian and East European Studies related research project (POLS 47905), and/or cultural enrichment offerings (RU 47100) in Russian and East European Studies.

#### COURSES IN RUSSIAN AND EAST EUROPEAN STUDIES

##### ANTHROPOLOGY

ANTH 30395. Russian Realms: Societies and Cultures of Eastern Europe and Beyond

##### ART, ART HISTORY, AND DESIGN

ARHI 30213. Art into History: Byzantine Art  
ARHI 30441. Twentieth-Century Art I (1900-1955)

##### ECONOMICS

ECON 30220. Marxian Economics  
ECON 33220. Marxian Economic Theory

##### FILM, TELEVISION, AND THEATRE

FTT 30246. Post-Soviet Russian Cinema

##### HISTORY

HIST 30408. The Holocaust  
HIST 30464. German History, 1740–1870 (requires permission)  
HIST 30465. Modern German History Since 1871 (requires permission)  
HIST 30470. Medieval and Early Modern Russia  
HIST 30471. Early Imperial Russia (1700-1861)  
HIST 30472. Late Imperial Russia (1861-1917)  
HIST 30473. Early Twentieth-Century Russian History: 1894–1945  
HIST 30474. Russian History since World War II  
HIST 30475. Twentieth-Century Russia: War and Revolution

HIST 30476. From Dostoevsky to Solzhenitsyn: Russian Intellectual History  
HIST 30481. History of Eastern Europe, 1900 through WWII  
HIST 30482. Eastern Europe Since 1945  
HIST 30483. History of Eastern Europe in the 20th Century  
HIST 30495. Twentieth-Century Poland  
HIST 30496. History and Cinema of Communist Poland  
HIST 30553. History and Cinema in East-Central Europe

#### HISTORY SENIOR SEMINARS

(Non-majors should request permission from course instructor)

HIST 43408. The Holocaust  
HIST 43471. Russian Engages the World  
HIST 43557. Modern European Revolutions  
HIST 34560. Communist Europe: The Soviet Bloc, 1945–1991

#### MUSIC

MUS 40023. Twentieth-Century Russian Composers: Skryabin, Stravinsky, Prokofiev, Shostakovich  
MUS 40024. Debussy, Ravel, Stravinsky

#### POLITICAL SCIENCE

POLS 30420. Building the European Union  
POLS 30424. Eastern European Politics  
POLS 30487. The Rise and Fall of World Communism  
POLS 30488. Transitions to Democracy  
POLS 34536. The Changing Face of Central/Eastern Europe  
POLS 40472. Soviet and Post-Soviet Russia

#### RUSSIAN LITERATURE AND CULTURE

*In English:*

RU 30101. Literature of Imperial Russia I (1800–1860)  
RU 30102. Literature of Imperial Russia II (1860–1899)  
RU 30103. Literature of the Russian Revolution (1900–1927)  
RU 30104. Literature of the Russian Dissidence (1925–1990)  
RU 30105. Russian Devils  
RU 30201. Dostoevsky  
RU 30202. Tolstoy  
RU 30301. Confessions of Saints, Sinners, and Madmen in Russian Literature  
RU 30302. Art and Morality in Nabokov  
RU 30510. One Thousand Years of Russian Culture  
RU 30515. Russian Realms: Societies and Cultures of Eastern Europe and Beyond  
RU 33301. *The Brothers Karamazov*  
RU 33302. St. Petersburg: Myth and Reality  
RU 33401. A Space for Speech: Russian Women Memoirists  
RU 33405. Women in Russian Literature  
RU 33450. Progress, Prosperity, (In)justice: The Plight of the Individual in Nineteenth-Century Literature  
RU 33520. Post-Soviet Russian Cinema

*In Russian:*

RU 43101. Nineteenth-Century Russian Literature  
RU 43102. Twentieth-Century Russian Literature

## AREA STUDIES MINORS

RU 43110. Introduction to Russian Poetry  
 RU 43204. Pushkin  
 RU 43206. Tolstoy  
 RU 43208. Chekhov  
 RU 43405. Russian Romanticism  
 RU 43416. Modernity in Shorts  
 RU 43450. Models of Exile  
 RU 43501. St. Petersburg as Russian  
 Cultural Icon

**THEOLOGY**

THEO 20249. The Eastern Rite Churches:  
 Theology and History  
 THEO 40278. Russian Religious Thought

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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 "Ask More of 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.

The undergraduate student body of the college is made up of sophomores, juniors, and seniors. Students who successfully complete the First Year of Studies are eligible for admission to the college at the beginning of the sophomore year.

The dean of the college has responsibility for admission following the First Year of Studies, as well as the registration, rating, probation, academic dismissal, and graduation of students with a Bachelor of Business Administration (BBA) degree.

## 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:

*The mission of the Mendoza College of Business is to build a premier Catholic business school that fosters academic excellence, professional effectiveness and personal accountability in a context that strives to be faithful to the ideals of community, human development and individual integrity.*

**Learning Objectives.** The educational objective of the undergraduate program in the Mendoza College of Business is to assist and guide students in preparation for lifelong learning, for effective citizenship and for professional careers as competent and ethical participants in business, government, and other complex organizations. This is accomplished by educating students in the professional area of business while remaining true to the scholarly, liberalizing, and Catholic mission of the college and the University.

The Mendoza College of Business has established the following program learning objectives in support of this mission and objective:

- Competence to analyze and evaluate business opportunities and challenges in a global context.
  - Students will evaluate strategies and formulate plans to realize business opportunities.
  - Students will recognize business problems, gather and analyze relevant evidence, and reach and articulate informed solutions.
  - Students will incorporate cross-border information, risks and opportunities in decision-making.
- Develop professional and interpersonal communication and collaborative skills. Students will produce professional quality business documents, deliver presentations and work collaboratively to accomplish business objectives.

- Ability to identify and respond to change. Students will recognize and respond to the impact of economic, social, and ecological change on people, organizations, technology and the environment within both domestic and global contexts.
- Proficiency to use information technology. Students will utilize current information/communication technology and appreciate the importance of emerging technology.
- Expertise within an academic major. Students will command the concepts, analytical tools, and technical skills that are essential to decision making within a concentration.
- Ability to integrate ethics into decision making. Students will apply ethical frameworks to business problems.

**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 four distinguishable but inter-related 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) an understanding of the economic and legal climate or atmosphere in which business functions and of which business is a part; (4) 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 three-year business program combined with that of the First Year of Studies requires approximately one-half of the instruction to be in traditional liberal studies. The faculties of the College of Arts and Letters and the College of Science provide the instruction for the liberal arts courses.

Upon entering the Mendoza College of Business at the beginning of the sophomore year, the student registers for a program which introduces the basic tools of business and the functions of accounting, information systems, financial management, management, business statistics, marketing, and business law.

In the junior and senior years the student continues his or her studies using the analytical tools developed in the sophomore year. The student enters into a consideration of the operation of the business firm and the economic and legal climate of business. The examination of the economic climate in which business must operate is concerned with the

## CURRICULUM FOR THE DEGREE OF BACHELOR OF BUSINESS ADMINISTRATION

fundamentals of money and banking, the role of the federal government in terms of its fiscal and monetary policies, and the concepts of national income accounting that afford a basis for measuring and forecasting economic change. A student gives emphasis to his or her major and may either add to minimum major requirements or elect other course areas for study.

## Curriculum for the Degree of Bachelor of Business Administration

The college stands ready to accept all applicants who have successfully completed the course requirements of the First Year of Studies (FYS) at Notre Dame as outlined in the University Requirements and FYS sections of this Bulletin. In addition to the general FYS requirements, Mendoza College of Business student intents should also complete the following specific courses during the FYS:

- Calculus
- Statistics for Business and Economics I
- Principles of Microeconomics

During the sophomore year, a College of Business student is expected to complete the following *minimum* business course credit hours:

Principles of Accountancy I and II	6
Corporate Financial Management	3
Principles of Marketing	3
Principles of Management	3
Business Law	3
Statistical Inference in Business	3
IT Management Applications	3
Intro to Business Ethics	1

The sequence of completion of courses will vary according to the availability of courses.

The BBA degree requires a total of 126 credits. Of these credit hours, a student has up to 8–11 free elective credits (depending on major) and must take 18 credits in non-business elective courses. Consequently, a student has considerable flexibility in selecting courses that meet his or her particular academic and career plans. Students in the Mendoza College of Business will declare a major in the spring semester of their sophomore year, in one of the following majors: accountancy, finance, marketing, management consulting, or information technology management. Majors will be approved based on meeting performance qualifications defined by the Major Declaration Algorithm found on the Mendoza College of Business Undergraduate Studies website. The Mendoza College of Business also offers an interdisciplinary minor in entrepreneurship through the Gigot Center for Entrepreneurship. Students desiring to select the entrepreneurship minor must be enrolled in the Mendoza College of Business with a declared major in accountancy, finance, marketing, management consulting, or information technology management and classification as a junior. Second

majors or concentrations in subject areas outside the Mendoza College of Business are also available. Students should refer to specific departments for opportunities and requirements.

To be eligible for the BBA degree, students must complete a minimum of 63 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:

Writing and Rhetoric	3
Mathematics (Calculus and Intro Statistics)	6
Science	6
History*	3
Social Science*+	3
Liberal Arts (excluding Economics)*	3
Literature* or Fine Arts*	3
Philosophy*	6
Theology*	6
Principles of Microeconomics	3
Accountancy I and II	6
Corporate Financial Management	3
Principles of Marketing	3
Principles of Management	3
Statistical Inference in Business	3
IT Management Applications	3
Business Law	3
Introduction to Business Ethics	1
Macroeconomic Analysis	3
Managerial Economics	3
Strategic Management	1.5
Introduction to Process Analytics	1.5
Foresight in Business and Society	3
Major courses**	18–21
Non-business electives	18
Free electives	8–11
2 semesters of physical education or ROTC	
	126

\* *One of these three-credit requirements must be a University Seminar course.*

\*\* *A minimum GPA of 2.000 is required in the major courses.*

+ *Must be in one of the following subject areas: Anthropology, Political Science, Psychology, Sociology*

General administration of the undergraduate program is accomplished in the Office of Undergraduate Studies, Room 101 Mendoza College of Business, which is also the repository for BBA student records. Advisors are available in this office to counsel students and answer questions concerning university and college requirements/policies. Faculty mentoring for juniors and seniors is available from their respective major departments; however, Room 101 advisors will continue to provide general advice on college and university issues. The department offices of the college, i.e. accountancy, finance, management, and marketing, are located in Room 102 of the Mendoza College of Business. In addition to the University pre-law advisor, Mendoza College offers pre-law advising to current undergraduate business students.

Information is available on the Mendoza College of Business website.

Normal semester course load for sophomores is 15–17 hours; for juniors and seniors, 15–19 hours. The minimum semester course load for all students is 12 hours. Normally, a cumulative and recent term grade point average of 3.4 or higher is required to obtain permission to carry an overload. Interested students should contact the Office of Undergraduate Studies for specific information.

Students may elect to fill free elective or non-business elective requirements with 1-, 1.5-, or 2-credit-hour courses, AP credit, or Credit by Exam. The college accepts a maximum of 36 credits through AP, including no more than six credits through AP and/or credit by exam in any one language, toward degree-seeking credits.

A minimum of 15 of the free or non-business elective credits must be filled with standard 3- to 6-credit courses (excludes AP credit) or graded 1.5-credit courses.

A maximum of three credit hours of workshops, service, activity or experiential learning from the following types of voluntary courses can be applied as free elective credit toward the 126 degree credits:

Band (Marching, concert and Jazz)  
Orchestra  
Chorale  
Glee Club  
Liturgical Choir  
Folk Choir  
Music Lessons and Ensembles  
Ballet and Dance  
Debate  
Theater Experience/Film Society  
Social Concerns Seminar  
FYS Introductory (FYS 10XXX)  
Peer Advising (AL 43001)

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 who register for and maintain a minimum of 12 credit hours may elect *one* course (not to exceed four credit hours) per semester under the pass-fail option. Only free elective and non-business elective courses may be taken pass-fail. No business courses, required courses, or courses in a student's second major or minor (other than the first course taken in a minor track) may be taken pass-fail even though taken as a free elective. The selection of a course as pass-fail must be made during the first six days of the semester and is irrevocable. Note: to be eligible for Dean's List status, a student must have a minimum of 12 graded credits for the semester.

Directed readings or special studies are not part of a standard curriculum for students in the Mendoza College of Business and cannot duplicate or substitute for an existing course. Directed readings or special studies are rare exceptions to established coursework, designed to support an area of research or study that is of mutual interest to a faculty member and a student. These courses contain advanced objectives beyond those covered in regularly scheduled courses—not introductory material or material taken from the popular literature that should more properly be considered “self-improvement” than academic in nature. A directed reading/special studies course will not satisfy a University, College, or major requirement. Directed readings or special studies outside of a student’s major in business may count as free elective or non-business elective credit only. A student may register for no more than three credit hours of directed readings or special studies in any given semester. No more than a maximum of nine directed reading or special studies credit hours may be applied toward the 126-credit-hour BBA degree requirements.

## International Study Programs

Students from any of the majors in the Mendoza College of Business may participate in international study programs.

For more than a decade, Notre Dame has made it possible for students to earn credits toward graduation in international study 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, France; Berlin, Germany; Dublin, Ireland; London, England; Fremantle, Australia; Rome, Italy; Monterrey and Puebla, Mexico; Nagoya and Tokyo, Japan; Santiago, Chile; Salvador da Bahia and São Paulo, Brazil; Beijing, Hong Kong and Shanghai, China; Toledo, Spain; Cairo, Egypt; and Athens, Greece. 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 International Study Programs, 105 Main Building.

## Collegiate Sequence in International Business

The Collegiate Sequence in International Business consists of courses which offer business students a broad exposure to the global nature of the world of business. Completion of the program is acknowledged with an International Business Certificate at graduation. While not a major or minor, this program enriches the student’s academic preparedness to take advantage of the multitude of opportunities and challenges awaiting them. The International Business Certificate substantiates a student’s acquisition of knowledge and perspective in the varying aspects of our ever-evolving global economy. The multidisciplinary aspect of the course selections enhances the student’s ability to communicate and engage in the international arena with a greater appreciation of diverse commerce, cultural and social contexts.

Since its introduction, an increasing number of students have earned the International Business Certificate each year. While a semester or summer of international study is encouraged and may be helpful in completing the certificate requirements, the certificate may be earned by taking courses on the main campus.

Fifteen credit hours of courses are required from among a variety of offerings from the Mendoza College of Business, the College of Arts and Letters and other national and international institutions. A minimum of two courses must be selected from among the contemporary international business course offerings, and the remainder from contemporary international liberal arts course offerings.

Students must indicate their intention to complete the program via the Mendoza College of Business Undergraduate tab on InsideND no later than the end of their junior year. Once a student’s intent to pursue the Collegiate Sequence in International Business has been indicated, the Graduation Process System will include an International Business Certificate section so as to assist in tracking progress toward completion of the requirements.

Courses for the International Business Certificate may not be taken on a pass/fail basis. Courses may “double count”—e.g., HIST 30432, Irish History Since 1800, would qualify as a contemporary liberal arts requirement for the certificate and would also satisfy the history requirement for graduation.

For more information, contact the Mendoza College of Business Office of Undergraduate Studies.

## Student Awards and Prizes

*The Dean’s Award.* This award is given to the graduate whose leadership has contributed most significantly to the progress of the college.

*The Hamilton Awards.* Founded by Robert L. Hamilton ’34, Racine, Wis., these awards are given to the outstanding senior in each of the four departments of the college.

*The Herman Crown Award for Outstanding Achievement in Finance.* An annual award made by the Department of Finance in memory of the late Herman Crown and given to the senior finance major with the highest overall grade point average.

*Raymond P. Kent Award.* An annual award given to a senior finance major for outstanding performance in finance classes.

*Paul F. Conway Award.* An annual award given to a senior in the Department of Finance who embodies the characteristics that define our tradition of excellence: a person of keen intellect who enriches the ideals of Notre Dame.

*LeClair Eells Award.* An annual award given to a senior finance major for outstanding leadership.

*Department of Finance Outstanding Service Award.* Given to a senior in the Department of Finance for rendering outstanding service to the department.

*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. The award is named for the late Paul D. Gilbert, a local business executive, civic leader, and longtime friend of the department.

*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.

*John R. Malone Award.* An annual award given to the junior marketing major with the highest overall grade point average.

*Robert M. Satterfield Award.* Given to a marketing student for bringing enthusiasm, integrity, and a spirit of teamwork to the classroom.

*David A. Appel Award.* Given to a marketing student for exemplary service contributions.

*Tara K. Deutsch Award.* An annual award given to an accountancy senior who has shown exemplary social consciousness and devotion to efforts to give hope to the less fortunate.

*Accountancy Chairman Award.* An annual award provided to an accountancy senior who demonstrates

## STUDENT ORGANIZATIONS AND ACTIVITIES

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.

*Accountancy Excellence Awards.* Given annually to up to 25 sophomores who declare accountancy as their major and have demonstrated outstanding economic achievement. The awards are funded by annual gifts from Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers.

*Crowe Horwath LLP Outstanding Accounting Student Scholarship Award.* This award is designed to assist a junior entering their senior year. The criteria for the award are exhibited leadership skills and achievement of accountancy and overall GPAs of 3.3.

*Peter Brady Award.* Established to honor past faculty member Peter Brady, this award is given in recognition of outstanding academic performance.

*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 accountancy seniors in recognition of academic achievement. The awards honor former accountancy professor James Dincolo and are funded by an endowment in his name.

*The Indiana Certified Public Accountants Society Award.* Founded in 1950 by the board of directors of the Indiana Association of Certified Public Accountants, this annual award provides a plaque to an outstanding senior in accountancy.

*The Management Award.* Given to the outstanding ITM senior in the Department of Management.

*The Justin Harris Brumbaugh Memorial Award.* Given annually to the graduating ITM major who has excelled academically and has been selected by the graduating seniors as best representing the unique and enduring spirit of Notre Dame.

*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 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.

## Student Organizations and Activities

Students' academic organizations are supported and encouraged by the administration and the faculty. These associations are actively managed by student officers. Members of the faculty serve in advisory capacities.

### Honorary Societies.

*Beta Gamma Sigma.* Notre Dame shares with selected colleges of business nationwide this honorary society's stated purposes of encouraging scholarship and achievement among business administration majors. It promotes education in business administration and fosters integrity in the conduct of business. 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 the Beta Sigma chapter of 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.

**Advertising Club of Notre Dame.** 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, to educate students on the careers associated with advertising, to follow and understand the trends of the advertising industry, to develop the individual abilities of its members, to learn how to be an effective advertising professional through observation, and to ultimately possess a better understanding of the advertising industry as a whole.

**ALPFA.** Formerly known as the Association of Latino Professionals in Finance and Accounting, 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.

**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.

**Finance Club of Notre Dame du Lac.** The Finance Club strives to educate students about different career paths in finance and to help them prepare for a career in finance. The club provides members with education on job options, interview prep courses, and networking opportunities with alumni, employers, and current students in the field.

**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.

**Net Impact Undergraduate Club.** The purpose of the Net Impact Undergraduate Club at Notre Dame shall be to raise awareness and interest in issues pertaining to sustainability and responsible business practices in accordance with the platform of Net Impact.

**Notre Dame Accounting Association (NDAA).** The Notre Dame Accounting Association exists to provide junior and senior accountancy majors and sophomore business majors who are considering accountancy as a major, an organization which provides support, employment contacts, social gatherings and events, and a unifying bond in the form of membership. Sophomores, juniors, and seniors majoring in, or intending to major in, accountancy are eligible for membership.

**Marketing Club.** The Marketing Club provides an opportunity for junior and senior marketing majors to learn about the field of marketing. Business executives who are active in the marketing profession are invited to speak to members several times during the year. These businesspeople address the club on a variety of marketing, selling, and advertising topics. The Marketing Club is also very active in promoting the students for permanent positions or internships via a career night held each fall.

**Information Technology Management Club, Notre Dame (ITMND).** The purpose of ITMND is to pool the resources of all persons interested in

## ACCOUNTANCY

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.

#### **Student International Business Council (SIBC).**

As one of the largest student organizations on campus, the SIBC is committed to its vision of establishing peace through commerce while educating its members and providing them an avenue to develop vital business and interpersonal skills with an international focus. The council is organized into various divisions representing all majors and concentrations within the Mendoza College of Business. Members are actively a part of projects which strive to offer unmatched, hands-on experience in everything from simulating the structure and debates of the European Central Bank and forming an in-depth fundamental and technical financial analysis of an international company, to managing the council's marketing needs and developing and maintaining our own website.

The council is also dedicated to bettering international relations by means of socially-conscious activities. One of note is the Haiti Bednet project that receives funding from both the SIBC and the W.K. Kellogg Foundation.

Within a given year, members travel to all corners of the globe. Each year, the SIBC grants around 40 students the chance to work as interns and teachers in a rapidly growing number of foreign countries—giving members the real-world experience that is highly desired in the current job market.

**Management Club.** The purpose of the Management Club is to involve students in activities that will take them beyond the classroom into the world of industry, labor, and government. Students obtain experience in managerial decision-making by exposure to real-life situations in which they can examine theory and principles in practice.

The Management Club schedules business professionals, labor leaders, and government officials to address its members; sponsors field trips to large industrial centers; and conducts an annual management workshop on important current issues facing management led by professional men and women. Members also develop organizational and administrative skills by participating in such endeavors as the operation of a Mardi Gras booth to raise funds for charity. As a social function, the club has smokers that allow students and faculty to meet and exchange views on an informal level.

**Real Estate Investment Club.** To give its members a strong background in the real estate industry by inviting knowledgeable speakers to campus, including alumni of the University, engaging in challenging real estate oriented projects, encouraging networking internships at real estate related businesses, and helping members to acquire full time jobs in the commercial, industrial and residential real estate and real estate finance industries after graduation.

#### **Undergraduate Women in Business Association.**

The Undergraduate Women in Business Association of Notre Dame is committed to the development of women's roles as students of business and as leaders in business-related fields. UWIB works to provide undergraduate women with the support and resources that will better prepare them for careers in business and achieving a work-life balance.

**Notre Dame Wall Street Club.** Through a network of current students and alumni, the Notre Dame Wall Street Club provides 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 the Street. Students interested in getting involved are encouraged to sign up for club emails, attend meetings, and reach out to club officers to talk about interests and opportunities.

## Accountancy

*Deloitte Foundation Professor of Accountancy, and Department Chair:*

H. Fred Mittelstaedt

*KPMG Professor of Accountancy:*

Thomas F. Schaefer

*Notre Dame Alumni Professor of Accountancy:*

Peter D. Easton

*Deloitte Professor of Accountancy*

David N. Ricchiute

*Professors:*

Kenneth W. Milani; Michael H. Morris; William D. Nichols; Ramachandran Ramanan; James L. Wittenbach

*Associate Professors:*

Brad A. Badertscher; Jeffrey J. Burks; Chao-Shin Liu; Jeffrey S. Miller; Juan M. Rivera (emeritus); James A. Seida; Thomas L. Stober; Sandra C. Vera-Muñoz

*Assistant Professors:*

Jeremy B. Griffin; Stephannie Larocque; Asís Martínez-Jerez; Jennifer Sustersic

*Professional Specialists:*

James L. Fuehrmeyer Jr.; Laura L. Hollis; Edward F. Hums; Brian R. Levey; Michael J. Meyer; Tonia H. Murphy; James A. O'Brien; Janet L. O'Tousa; William J. Schmuhl

**Program Objectives.** The 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. 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 Notre Dame Career Center by (a) maintaining an outstanding record of placing high percentages of graduates with national accounting firms and other large corporations such as Citigroup, Disney and GE; and (b) supporting student desires to pursue other postgraduate options, including volunteer work, military service, and graduate education.

**Program of Studies.** The accounting sequence begins with Accountancy I and II (ACCT 20100 and 20200). These courses, normally taken in the sophomore year and required of all business students, are designed to provide a broad introduction to the accounting function, the profession of accountancy and the role of accounting in society.

Students choosing the accountancy major must complete the following Department of Accountancy requirements.

ACCT 30110. Accounting Measurement and Disclosure I  
 ACCT 30120. Accounting Measurement and Disclosure II  
 ACCT 30210. Strategic Cost Management  
 ACCT 30280. Decision Processes in Accounting  
 ACCT 40510. Audit and Assurance Services  
 ACCT 40610. Federal Taxation

#### 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. Many 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.

#### COURSE DESCRIPTIONS

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

## Finance

*Fred V. Duda Professor in Business, and*

*Department Chair:*

Richard R. Mendenhall

*Kenneth R. Meyer Chair in Global Investment*

*Management:*

Roger D. Huang

*C.R. Smith Professor of Finance:*

Timothy J. Loughran

*Bernard J. Hank Professor of Business Administration:*

Frank K. Reilly

*John W. and Maude Clarke Professor of Finance:*

Paul H. Schultz

*Notre Dame Professor of Finance:*

John E. Affleck-Graves

*Professors:*

Robert Battalio; Jeffrey H. Bergstrand; Thomas

Cosimano; Martijn Creemers; Barry P. Keating;

Bill D. McDonald; Richard G. Sheehan

*Associate Professors:*

Shane Corwin; Zhi Da; John A. Halloran;

Michael L. Hemler; D. Katherine Spiess

*Assistant Professors:*

Andriy Bodnaruk; Matthew Cain; Priyank

Gandhi; Pengjie Gao; Benjamin Golez; Marco

Rossi; Sophie Shive

*Professional Specialists:*

Carl Ackermann; Walter Clements; Margaret

Forster; Jerry Langley

*Associate Professional Specialists:*

David Hutchison; John Stiver

*Assistant Professional Specialists:*

Kristen Collett-Schmitt; James Leaday

**Program Objectives.** The department offers courses with the dual objective of (1) providing a broad foundation so that students can pursue further study at the graduate level and (2) equipping students with the base of knowledge and skills necessary for entry into the financial world.

**Program of Study.** All students enrolled in the Mendoza College of Business are required to take an introductory finance course during their sophomore year; this course provides an overview of issues encountered by a firm’s financial manager. Finance majors must complete FIN 20150 Corporate Financial Management with a grade of C or higher. This course cannot be repeated for a higher grade. All business students are also required to complete two courses in business economics: FIN 30210 Managerial Economics and FIN 30220 Macroeconomic Analysis. The aim of these courses is to provide students with an understanding of the economic environment within which business enterprises operate.

In addition to the courses required of all candidates for the degree of bachelor of business administration, finance majors are required to take six courses offered by the department and one additional course offered by the Department of Accountancy. The required courses are FIN 30400 Advanced Corporate Finance,

FIN 30600 Investment Theory, ACCT 30100 Corporate Financial Reporting, and four 40000-level finance electives chosen from the specialized courses offered by the department.

The finance elective courses are designed to equip students with the knowledge to progress in whatever area of business they choose upon graduation. The subject matter in these courses—investments, corporate finance, financial markets, financial institutions, and real estate—can be tailored to meet the student’s individual interests. Graduates of the department are currently pursuing successful careers in many areas of business, including investment banking, commercial banking, and corporate financial management, among others.

Students who intend to take the examinations leading to the Chartered Financial Analyst (CFA) designation should structure their programs with that objective in mind. The two business law classes (BALW 20150 and ACCT 40710) should be included in their program, along with appropriate courses in accounting and investments, including FIN 40660 Fixed Income Investment Strategies.

#### COURSE DESCRIPTIONS

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

## Management

*John W. Berry Sr. Professor of Business, and  
Department Chair:*

David B. Hartvigsen

*Joe and Jane Giovanini Professor of Management:*

Robert D. Bretz

*Edward Frederick Sorin Society Professor of  
Management:*

Edward J. Conlon

*Franklin. D. Schurz Professor of Management:*

Timothy A. Judge

*Fred V. Duda Professor of Business:*

Sarv Devaraj

*Professors:*

J. Michael Crant; Sarvanan Devaraj; John G.  
Keane (emeritus); Khalil F. Matta (emeritus);  
William P. Sexton (emeritus); Ann E. Tenbrunsel

*Associate Professors:*

Corey Angst; Viva O. Bartkus; Matthew C.  
Bloom; Yu-Chi Chang (emeritus); Robert F.  
Easley; Nasir Ghiaseddin; Ken Kelley; Daewon  
Sun; Jerry C. Wei; Oliver F. Williams, C.S.C.

*Assistant Professors:*

Idris Adjerid; Emily Block; Craig Crossland;  
Ante Glavas; Hong Guo; Sean Handley; Lin  
Hao; Jasmine Hu; Kaifeng Jiang; Mei Li;  
Michael Mannor; Adam Wowak; Katie Wowak;  
Xuying Zhao

*Professional Specialists:*

James S. O'Rourke IV

*Associate Professional Specialist:*

Wendy Angst; Sandra Collins; Chad Harms;  
Joseph Holt; Amanda McKendree; Jessica  
McManus Warnell; John Michel; Sam Miller;  
Elizabeth Tuleja; Jennifer Waddell; Michael  
Whitt

*Assistant Professional Specialists:*

Tim Balko; Bruce Harris; Marie Halvorsen-  
Ganepola; Robert Lewandowski

**Programs of Study.** The Department of Management offers an integrated program of study with opportunities for specialization in information technology management or consulting. All management majors are required to complete general coursework on the management of information, people, and work processes. They must then select a track that prepares them for careers in the management of information technology or consulting and problem solving.

### Management Department Core Requirements:

MGT 30220. Management Communication	1.5 hrs.
MGT 30660. Strategic IT Applications	1.5 hrs.
MGT 30490. Business Problem Solving	3.0 hrs.
MGT 40700. Project Management	1.5 hrs.
MGT 40750. Quantitative Decision Modeling	1.5 hrs.

### INFORMATION TECHNOLOGY MANAGEMENT MAJOR

The ITM program is designed to prepare students to become leaders in the use of information technology for the benefit of organizations and society. This program of study focuses on educating students about the development and use of information systems as decision-making and problem-solving tools. The program also is intended to develop an understanding of the managerial issues encountered in the introduction or operation of IT solutions in organizations, particularly, how these tools can be used to gain a competitive edge and to re-engineer an organization.

#### ITM Major Required Courses

In addition to the core courses listed above, all ITM majors must take the following four courses, and are eligible to take the elective courses that follow:

MGTI 30610. Application Development	3.0 hrs.
MGTI 30620. Business Intelligence	3.0 hrs.
MGTI 30630. Systems Analysis and Design	3.0 hrs.
MGTI 30640. Networking and Security	3.0 hrs.

#### ITM Elective Courses

MGTI 40612. Android App. Development	3.0 hrs.
MGTI 40630. Advanced Database Topics	1.5 hrs.
MGTI 40660. Building Web Applications	3.0 hrs.

### CONSULTING MAJOR

The consulting program prepares students to manage people and processes within both large and small organizations or to advise organizations on those management issues. A particular emphasis is placed on managing within organizations facing the challenges of rapid change and increased competition. The major is designed to provide sufficient flexibility for students to prepare for several career paths by preparing students to think systematically about the processes through which organizations achieve excellence.

#### Consulting Major Required Courses

In addition to the core courses listed above, all consulting majors must take any four of the following five courses:

MGTC 30300. Management Competencies	3.0 hrs.
MGTC 30450. Strategic Human Res. Mgt.	3.0 hrs.
MGTC 30460. International Management	3.0 hrs.
MGTC 40410. Leadership and Motivation	3.0 hrs.
MGT 40420. Innovation and Design	3.0 hrs.

#### Consulting Elective Course

BAET 40540. The Business of Sustainability	3.0 hrs.
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### ENTREPRENEURSHIP MINOR

The Gigot Center for Entrepreneurship in the Mendoza College of Business offers an interdisciplinary minor in entrepreneurship to students enrolled in the College. The minor complements a business major by providing students the opportunity to study and learn about the development of new ventures that promote self-sufficiency, create jobs, and make significant contributions to our communities. Through unique, state-of-the-art courses, the minor helps students build skills needed to identify opportunities and launch new ventures. Students who combine a minor in entrepreneurship with one of the traditional business majors can find employment in corporate areas of research and development, new product key accounts, and launch turnaround management and strategic planning and execution.

#### Entrepreneurship Minor Required Courses

BAEN 30500: Intro. to Entrepreneurship	3.0 hrs
BAEN 30505: Social Entrepreneurship	3.0 hrs
BAEN 30510: Go-to-Market	1.5 hrs
BAEN 30520: Funding new Ventures	1.5 hrs
BAEN 30530: Legal Issues in Entrepreneurship	1.5 hrs
BAEN 40420: Innovation and Design	3.0 hrs*
BAEN 40570: Entrep. Sales Management	1.5 hrs

*\*this course may not be counted toward the management consulting major elective requirement*

#### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- *Management*
- *Management - Consulting*
- *Management - IT*
- *Business Administration - Entrepreneurship*

Course descriptions can be found by clicking on the subject code and course number in the search results.



## Marketing

*Raymond W. and Kenneth G. Herrick Professor of Marketing, and Department Chair:*

John F. Sherry Jr.

*Aloysius and Eleanor Nathe Professor of Marketing Strategy:*

William L. Wilkie

*John T. Ryan Jr. Chair in Business Ethics and Professor of International Ethics:*

Georges Enderle

*Professors:*

Shankar Ganesan; John J. Kennedy; Patrick E. Murphy; Joel E. Urbany

*Associate Professors:*

John E. Gaski; Timothy J. Gilbride; Elizabeth S. Moore

*Assistant Professors:*

Tonya W. Bradford; Frank A. Germann; Katherine Sredl; James E.B. Wilkie

*Professional Specialists:*

Kevin D. Bradford

**Program of Studies.** Students completing a degree in marketing at Notre Dame should: (1) understand the decision-making processes of buyers and sellers in a market; (2) know how to apply behavioral models and quantitative tools to the analysis of marketing issues; (3) be able to develop informed marketing and organizational strategies; (4) be effective in working in a team environment; and (5) recognize the ethical and social responsibilities of marketing practitioners.

In accordance with these objectives, all students in the Mendoza College of Business take Introduction to Marketing in their sophomore year. Students choosing marketing for their professional major are required to take MARK 30100 Consumer and Organizational Buyer Behavior, MARK 30120 Marketing Research, MARK 40100 Strategic Marketing, and three marketing electives.

The Marketing Research and Consumer and Industrial Buyer Behavior courses, taken in the junior year, develop a foundation in the tools and concepts germane to marketing decision making. During the senior year, students take Strategic Marketing, an advanced marketing strategy course that integrates marketing concepts and the other business functions through projects and simulations.

These courses are supplemented by the extracurricular activities of the Marketing Club and the Advertising Club.

All courses in the department focus on the performance of the marketing process but do not restrict it to a particular situation. Thus, the student majoring in marketing is prepared for a wide range of opportunities in business and nonbusiness organizations, including professional sales, customer service, product or brand management, advertising, public relations, market research, retail merchandising, and electronic commerce. Marketing majors are

being employed by an increasing number of firms specializing in areas such as consulting, retailing, and other service businesses that have traditionally underestimated the importance of this function. Additionally, nonbusiness and nonprofit organizations (hospitals, educational institutions, charitable organizations) are discovering the critical importance of marketing in their operations and are seeking well-trained graduates.

### COURSE DESCRIPTIONS

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

## Non-Departmental Courses

*Assistant Dean for Undergraduate Studies:*

Dale M. Nees, Mendoza College of Business

Many courses in the college are designed to cross departmental lines and provide basic tools during the sophomore and junior years or to foster the integration of various disciplines during the junior and senior years. These courses are open to all business students with appropriate prerequisites.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Business (Non-departmental)*
- *Business Administration*
- *Business Administration - A&L*
- *Business Administration - Communication*
- *Business Administration - EG*
- *Business Administration - Ethics*
- *Business Administration - Business Law*
- *Business Administration - Management*
- *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**

ROGER D. HUANG, Ph.D.

*Dean of the Mendoza College of Business*

JEFFREY H. BERGSTRAND, Ph.D.

*Associate Dean of the Mendoza College of Business*

DALE M. NEES, M.S.

*Assistant Dean of the Mendoza College of Business*

H. FRED MITTELSTAEDT, Ph.D.

*Chair of the Department of Accountancy*

RICHARD R. MENDENHALL, Ph.D.

*Chair of the Department of Finance*

DAVID B. HARTVIGSEN, Ph.D.

*Chair of the Department of Management*

JOHN F. SHERRY, Ph.D.

*Chair of the Department of Marketing*

## ADVISORY COUNCIL

## Advisory Council

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FRANK J. BELATTI <i>Atlanta, Georgia</i>	THOMAS F. GROJEAN SR. <i>Mendota Heights, Minnesota</i>	MICHAEL F. PASQUALE <i>Hilton Head, South Carolina</i>
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JOHN BLYSTONE <i>Charlotte, North Carolina</i>	WILLIAM J. HANK <i>Westmont, Illinois</i>	PAUL E. PURCELL (Chair) <i>Milwaukee, Wisconsin</i>
WILLIAM C. BROWN <i>Oklahoma City, Oklahoma</i>	CHARLES M. HANSEN JR. <i>Dallas, Texas</i>	THOMAS H. QUINN <i>Deerfield, Illinois</i>
EDWARD C. COPPOLA JR. <i>Dallas, Texas</i>	TODD W. HERRICK <i>Petoskey, Michigan</i>	MARK H. RAUENHORST <i>Minnnetonka, Minnesota</i>
JOSEPH F. COYNE <i>Los Angeles, California</i>	JAMES L. HESBURGH <i>Notre Dame, Indiana</i>	PAUL C. REILLY <i>St. Petersburg, Florida</i>
THOMAS J. CROTTY JR. <i>Waltham, Massachusetts</i>	DANIEL R. HESSE <i>Overland Park, Kansas</i>	ROBERT E. REILLY JR. <i>Chicago, Illinois</i>
JEROME J. CROWLEY JR. <i>Los Altos, California</i>	RICHARD J. HUETHER <i>Schenectady, New York</i>	RICHARD A. ROSENTHAL <i>Niles, Michigan</i>
J. OLIVER CUNNINGHAM <i>Phoenix, Arizona</i>	JAMES M. JAEGER <i>Los Angeles, California</i>	JOHN T. RYAN III <i>Cranberry Township, Pennsylvania</i>
PERRY N. DELLELCE <i>Toronto, Ontario</i>	GARY R. KANEB <i>Lymfield, Massachusetts</i>	DAVID A. SABEY <i>Seattle, Washington</i>
MATTHEW S. DeSALVO <i>Stamford, Connecticut</i>	JOHN A. KOLTES <i>Edina, Minnesota</i>	GEORGE E. SCHARPF <i>Old Bridge, New Jersey</i>
MAURICE J. DeWALD <i>Newport Beach, California</i>	JOHN R. LOFTUS <i>Geneva, Illinois</i>	KEITH S. SHERIN <i>Fairfield, Connecticut</i>
THOMAS P. DOLPHIN <i>Minneapolis, Minnesota</i>	FRANCES E. LOVE <i>Chicago, Illinois</i>	BAILEY J. SIEGFRIED <i>Tulsa, Oklahoma</i>
ROBERT E. DOWDELL <i>Laguna Beach, California</i>	JOHN G. MARTIN <i>Chicago, Illinois</i>	JAMES D. SINEGAL <i>Issaquah, Washington</i>
JOSE RAFAEL FERNANDEZ <i>San Juan, Puerto Rico</i>	ROXANNE M. MARTINO <i>Chicago, Illinois</i>	CYNTHIA HANK STARK <i>Westmont, Illinois</i>
JAY M. FERRIERO <i>McLean, Virginia</i>	MICHAEL J. MATHILE <i>Dayton, Ohio</i>	RICHARD G. STARMANN SR. <i>Westchester, Illinois</i>
CYRUS F. FREIDHEIM JR. <i>North Palm Beach, Florida</i>	THOMAS D. McCLOSKEY JR. <i>Aspen, Colorado</i>	ROBERT A. SULLIVAN <i>Chicago, Illinois</i>
GARY R. GARRABRANT <i>New York, New York</i>	J. LUKE McGUINNESS JR. <i>Chicago, Illinois</i>	IRMA L. TUDER <i>Madison, Alabama</i>
ROBERT A. GARVEY <i>West Palm Beach, Florida</i>	KENNETH R. MEYER <i>Winnetka, Illinois</i>	JOHN B. VEIHMEYER <i>New York, New York</i>
ROBERTO GARZA DELGADO <i>Garza Garcia, Mexico</i>	MICHAEL J. MURRAY <i>San Francisco, California</i>	JAMES F. WADE <i>Boston, Massachusetts</i>
JOHN C. GERSPACH <i>New York, New York</i>	VERA L. MUZZILLO <i>Independence, Ohio</i>	VALERIE M. BARKER WALLER <i>Chicago, Illinois</i>
GARY E. GIGOT <i>Bellevue, Washington</i>	NEIL NAUGHTON <i>Duleek, County Meath, Ireland</i>	
JOSEPH E. GIOVANINI <i>Jackson, Wyoming</i>	T. MICHAEL NEVENS <i>Los Altos Hills, California</i>	

# 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, including 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 of 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](http://engineering.nd.edu).

Engineering at Notre Dame combines technical inquiry with a creative bent (novel methods of using and producing materials, components, devices, and systems) to develop innovations that can improve the health, well-being, and quality of life for all persons. Consistent with the University's Catholic mission and heritage, the College of Engineering's mission is founded on the principle that the creation and transfer of knowledge should reflect a profound and complete respect for the dignity of all persons and for the greater common good of humanity. To appropriate the words of the University's founder, Rev. Edward A. Sorin, C.S.C., the college must be, first and foremost, a force for good in the world.

To that end, the college will continue to engage in transformational research in its core competencies—energy, biomedical/bioengineering, environmental science/engineering, and national/personal security—as they address the important needs of humanity, while inspiring students of all levels to scholarship and service. It will also continue to develop its expertise in electronic materials and devices, wireless and information systems, natural hazard mitigation, flow physics and control, geochemistry and geosciences, hydrology, and computational science and engineering, translating research outcomes into commercial ventures as possible, so that the efforts of Notre Dame engineering researchers produce the greatest good for society.

**Accreditation and Academic Association.** The College of Engineering is a member of the American Society for Engineering Education. All engineering curricula are accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The computer science curriculum is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>.

**Registration of Engineers.** Registration of engineers is required for many fields of practice. Recent graduates need not acquire registration immediately upon graduation, but they benefit by applying early for the required state examination. Graduating from accredited programs such as those offered by Notre Dame facilitates registration as a professional engineer.

**Registration of Geoscientists.** Registration is required for geoscientists to practice in many states. The degree in environmental geosciences offered by the Department of Civil and Environmental Engineering and Earth Sciences provides the necessary academic background for graduates to successfully complete registration as a professional geoscientist.

## 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 environmental geosciences\*  
 B.S. in mechanical engineering

\* Program to be discontinued for new students beginning fall 2013

\*\* Program to begin for sophomores entering the college in fall 2013

To complete all degree requirements, the student must take and pass all of the courses specified in the Bulletin for the given degree and must earn the total minimum number of course credit hours specified for the degree.

To obtain two undergraduate degrees from the College of Engineering, a student must successfully carry out an approved program of courses totaling no less than 157 credit hours, depending on the programs. These must include all of the courses specified in the Bulletin for each degree.

The college offers advanced degrees in the following areas:

M.S. in aerospace engineering  
 M.S. in bioengineering  
 M.S. in chemical engineering  
 M.S. in civil engineering  
 M.S. in computer science and engineering  
 M.S. in electrical engineering  
 M.S. in environmental engineering  
 M.S. in geological sciences  
 M.S. in mechanical engineering  
 Ph.D. in aerospace and mechanical engineering  
 Ph.D. in bioengineering  
 Ph.D. in chemical engineering  
 Ph.D. in civil engineering and geological sciences  
 Ph.D. in computer science and engineering  
 Ph.D. in electrical engineering

The Department of Aerospace and Mechanical Engineering also offers a non-thesis master of engineering (M.E.) in mechanical engineering.

The details of the programs and the engineering courses offered at the graduate level are in the Graduate School *Bulletin of Information*.

**Engineering Common Core.** All engineering curricula consist of each of the following:

**Arts and Letters Core:** 24 credit hours. Writing and Rhetoric (one course), University Seminar\* (one course), history (one course), social science (one course), fine arts or literature (one course), philosophy (two courses) and theology (two courses).

\*The University Seminar may be selected from an appropriate history, social science, fine arts, literature course, or the first course in theology or philosophy, and will satisfy the respective requirement.

**Basic Science Core:** 36 credit hours. MATH 10550 Calculus I; MATH 10560 Calculus II; MATH 20550 Calculus III, MATH 20580 Introduction to Linear Algebra and Differential Equations; CHEM 10171 General Chemistry: Fundamental Principles; CHEM 10122 General Chemistry: Biological Processes; PHYS 10310 General Physics I; PHYS 10320 General Physics II; EG 10111, 10112 Introduction to Engineering Systems I and II

**First Year of Studies.** A first-year student enters the Notre Dame First Year of Studies for one academic year of basic collegiate studies before entering a department within the college. In the spring of the first year of studies, a first-year student intending to major in engineering will select a major. If the student is scholastically sound for the given choice, approval will be given.

## PROGRAMS AND DEGREES

A first-year student intending to major in any of the College of Engineering programs should 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
Arts and Letters course†	3
EG 10111. Introduction to Engineering Systems I#	3
Physical Education	—
	17

*Second Semester*

University Seminar+	3
MATH 10560. Calculus II	4
CHEM 10122. General Chemistry: Biological Processes*	3
PHYS 10310. General Physics I	4
EG 10112. Introduction to Engineering Systems II#	3
Physical Education	—
	17

+ *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, and will satisfy the respective requirement. The College of Engineering recommends selecting the first courses in theology and philosophy, as well as composition, to enable maximum schedule flexibility in later semesters.*

\* *All majors will accept CHEM 10171/10122 or CHEM 10171/10172 or CHEM 10181/10182 as satisfying the two-course chemistry requirement.*

† *See Arts and Letters Core above.*

# *While EG 10111–10112 is acceptable for the environmental geosciences degree, it is not required and the sequence ENVG 10110–10100 or ENVG 10110–10250 (full 2012 sophomores only) may be substituted.*

**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 number of credit hours carried by the undergraduate student in the College of Engineering may not exceed 19 hours without permission, granted at the discretion of the assistant dean for academic affairs.

**Engineering Scholars Program (ESP).** The College of Engineering has developed a program for those students whose achievements have identified them as among the best of entering first-year students. This program provides special opportunities for classroom interaction, cultural enrichment, and social leadership. Admission to the program is by invitation. ESP students take a special yearlong seminar in the first

year that satisfies two University core requirements. Participation in this program is independent of participation in the Engineering Honors Program.

**Engineering Honors Program (EHP).** The Engineering Honors Program provides an intensive, research-based experience for students who have shown exceptional promise during their first two years in the college. Admission to the EHP is made after application to the individual department program no earlier than fall of the student's junior year. Each student in this program will be guided by a faculty member who functions as the student's research advisor and mentor, and students and faculty meet regularly in both formal and informal settings. To graduate with recognition as an honors program student, each student must, at a minimum, engage in two semesters of research and complete a research thesis in the student's major field in the senior year, and be eligible for Latin honors at graduation. Individual departments retain the right to add other criteria to this minimum set of requirements.

**International Study Opportunities.** The University strongly supports study abroad and has encouraged the programs in the College of Engineering to participate. At present, there are semester- or year-long opportunities during the academic year for juniors in Dublin, Ireland; London, England; Perth, Australia; Puebla, Mexico; Cairo, Egypt; and Santiago, Chile. The programs in Mexico and Chile require the student to be fluent in Spanish. In each location, students must take at least two technical courses to remain on track for graduation. Programs vary by semester, and not all locations are appropriate for every major in the college. Students should contact a department adviser to work out any details.

The college currently offers two summer programs for engineering undergraduates who have completed at least the first-year engineering curriculum, in London, England, and Alcoy, Spain.

Admission to all programs is competitive and requires demonstration of satisfactory academic performance.

**ROTC Programs.** ROTC students who complete their programs may use a maximum of six credits of upper-level air, military, or naval science courses as substitutes for specified degree requirements determined by each department. Three of these credits may substitute for either a history or social science requirement; three may substitute for a technical elective at the discretion of each major program. No other air, military or naval science credits not so substituted may be credited toward degree requirements in programs in the College of Engineering.

**Liberal Arts in the Curriculum.** Students enrolled in the College of Engineering must satisfy all University degree requirements, including writing and rhetoric (three credits), University Seminar\* (three credits), history (three credits), social science (three credits), fine arts or literature (three credits), philosophy (six credits) and theology (six credits).

For specific information on course offerings to satisfy these requirements, students must consult the online course registration system.

\**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, and will satisfy the respective requirement.*

**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. Choice of the program should be indicated 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.** Consistent with the college's recognition that the liberal arts help students to understand the societal contexts in which engineering solutions are developed, 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

## PROGRAMS AND DEGREES

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.

The program is structured so that a student who has completed the first three years of the bachelor's degree program, if accepted through a competitive admissions process, completes the master of business administration and the bachelor of science in engineering by the end of the fifth year. This program may require summer or intersession work.

Students who wish to pursue this program should have a superior scholastic record in their undergraduate program and must apply to and be accepted by the MBA program during their third year in the College of Engineering.

The general sequence of courses in the five-year engineering-MBA program may be found under "Dual Degree Programs" later in this section of the *Bulletin*.

**Combination Five-Year Program with Saint Mary's College.** Students at Saint Mary's College may elect to earn a B.S. in biology, chemistry, or mathematics from Saint Mary's while simultaneously earning a B.S. in a related engineering program at Notre Dame. This program requires five years of study, with only the fifth year at Notre Dame to satisfy residency requirements. Students interested in this program must consult the appropriate advisor(s) at Saint Mary's College before enrolling in required courses at Notre Dame.

Through a special arrangement, students at Saint Mary's College, Notre Dame, Ind., may take a combination program of science classes at Saint Mary's and engineering classes at Notre Dame beginning in their sophomore year at Saint Mary's. The student will earn her bachelor of science degree from Saint Mary's at the end of the fourth year, and complete her bachelor of science in engineering degree in her fifth year at Notre Dame.

**Combination Five-Year Programs with Other Schools.** The highly desirable objective to infuse more liberal arts and sciences work into the education of engineering students has also been met also through 3-2 engineering programs with select liberal arts institutions.

The University of Notre Dame has entered into agreements with Assumption College, Worcester, Mass.; Bethel College, Mishawaka, Ind.; Carroll College, Helena, Mont.; Elon University, Elon, N.C.; Franciscan University, Steubenville, Ohio; Goshen College, Goshen, Ind.; Kings College, Wilkes-Barre, Penn.; Loyola University Chicago, Chicago, Ill.; Saint Anselm College, Manchester, N.H.; Stonehill College, Easton, Mass.; University of St. Thomas, St. Paul, Minn.; University of St. Thomas, Houston, Tex.; Xavier University of Louisiana, New Orleans, La., and the Atlanta University Center, comprising Morehouse College, Spelman College and Clark Atlanta University in Atlanta, Ga., whereby the liberal arts and sciences part of a combination five-year program is given by these respective colleges and the engineering part by Notre Dame. In these dual-degree programs, the student spends three years at a college of first choice and two years at Notre Dame. After completion of the five-year program, the student receives a bachelor of arts or bachelor of science degree from the first college and a bachelor of science in engineering degree from Notre Dame.

The sequence of courses for any of these programs will vary depending on the program of study at the other institution. No attempt has been made to set up a rigid pattern, and each participating institution has some freedom concerning the choice and arrangement of courses, provided that the coverage in the areas of mathematics, physics, chemistry, computing, introductory engineering, theology, philosophy, history, social science, and literature or fine arts is appropriate. It is expected, however, that students will complete the equivalent of the first two years of the desired College of Engineering program before applying for transfer.

To be eligible for an undergraduate degree, the student must complete a minimum of 60 credit hours at the University with a minimum of 75% of the degree credit hours (not less than 90 credit hours) earned after high school graduation through college and university courses, and be enrolled in the last semester on the main university campus. Please consult the Undergraduate Academic Code for further details.

Details of these programs may be obtained by writing to the institutions concerned or to the College of Engineering.

**Graduate Programs in Engineering.\*** The Graduate School of the University of Notre Dame comprises four divisions: humanities, social science, science, and engineering. The division of engineering was organized in 1946 with power to grant advanced degrees in the departments of aerospace and mechanical engineering, chemical and biomolecular engineering, civil and environmental engineering and earth sciences, computer science and engineering, and electrical engineering. The general conduct of graduate work is under the jurisdiction of the Graduate Council of the University, the members

of which serve as specified in the Academic Articles. Director of the program in the engineering division is the dean of the College of Engineering.

\* Reference should be made to the *Graduate School Bulletin of Information for details of these programs and to the Web at <http://graduateschool.nd.edu/departments-and-programs/degree-programs-by-division/>.*

## MINORS

The College of Engineering offers six minors, open to all University students who have taken the appropriate pre-requisite courses for upper-level engineering and science courses. For students in the College of Engineering, only one course required for the minor may double-count towards degree requirements and the minor. Students in other colleges should consult their own program department for similar restrictions.

### Bioengineering

This minor, offered by the Department of Aerospace and Mechanical Engineering and the Department of Chemical and Biomolecular Engineering, comprises a six-course sequence that teaches students how to use the tools of engineering analysis with the fundamentals of the engineering and life sciences, to enliven the understanding of living organisms, medical treatments and biochemical pathways and to provide quantitative predictions and insight towards the design of medical and biological devices and processes. The six-course minor consists of three foundational courses in bioengineering, cell biology and more advanced courses in the biology field, along with three courses specializing in areas such as biomaterials, biomechanics, biotransport/microdevices, tissue engineering and biomaterials, molecular and cellular bioengineering, bioinformatics, biomedical imaging and treatment, and environmental bioactivity and remediation. Details are provided at [ame.nd.edu/undergrad-programs/minors-and-concentrations](http://ame.nd.edu/undergrad-programs/minors-and-concentrations).

### Computational Engineering

This minor, offered by the Department of Aerospace and Mechanical Engineering, recognizes the importance of computational tools in all disciplines of engineering and gives students exposure to the fundamentals of programming and numerical methods, experience and skills in computer usage, and knowledge of applications from a range of different areas. The minor requires fifteen credit-hours (nominally five courses) selected from among a list available at [ame.nd.edu/undergrad-programs/minors-and-concentrations](http://ame.nd.edu/undergrad-programs/minors-and-concentrations).

### Energy Engineering

This minor, offered by the Department of Aerospace and Mechanical Engineering, recognizes that Energy is an important subject of current interest that involves many engineering and non-engineering disciplines, and enables students to develop a stronger background in and to prepare better for professional

## DEPARTMENTAL AWARDS

jobs or higher studies in the area. This minor differs from the Energy Studies minor as described below in that it focuses on the technical aspects of energy and requires courses concentrated in engineering and science. The minor requires five courses from among a list available at [ame.nd.edu/undergrad-programs/minors-and-concentrations](http://ame.nd.edu/undergrad-programs/minors-and-concentrations).

### Energy Studies

This minor, offered by the Center for Sustainable Energy at Notre Dame (cSEND) through the Department of Chemical and Biomolecular Engineering, differs from the minor in Energy Engineering described above in that it requires less technical content and more broadly examines the issue of energy from a variety of perspectives. Through this minor, students will learn to: quantify energy resources and use and recognize the fundamental laws of thermodynamics that govern energy conversion; develop a functional knowledge of the historical and economic frameworks that guide decision-making in the energy industry today; develop oral and written communication skills necessary to convey the critical information about energy to the non-expert; understand the environmental consequences such as pollution and climate change of today's energy technologies; understand the linkages between ethics and energy utilization; critically assess the strengths and weaknesses and the prospective impact of alternative energy technologies; and understand the influence of geopolitics, economics and public policy on our nation's and the world's energy future. The minor requires:

ENER 20101

ENER 20102

CSC 33095 (strongly recommended)

and three courses (nine credit-hours) concentrated either in a technical or non-technical area of energy studies, approved in advance by the director of the Energy Studies Minor, selected from a list maintained by cSEND.

### Engineering Corporate Practice

This minor, offered by the college in cooperation with the Mendoza College of Business, is restricted to students in their final year as undergraduates in the college, and participation may be restricted due to capacity limitations in Mendoza. To qualify for consideration for the minor, a student must complete the first two courses of the Engineering Business sequence, EG 40421/44421 and EG 40422, by the end of junior year. The minor comprises those two courses, a course in economics, and accountancy and corporate finance courses offered through Mendoza. Complete details for the minor are available at <https://engineering.nd.edu/academics/undergraduatedegreeprograms>.

### Environmental Geosciences

This minor, offered by the Department of Civil and Environmental Engineering and Earth Sciences, provides background for students interested in learning about the physical sciences, emphasizing the processes that occur near or at the surface of the

Earth, and the impact of human activity on such processes. The minor requires 16 credit hours distributed across four courses, plus a field experience:

All students pursuing the minor must take:

	credit hours
ENVG 20110 Physical Geology & Lab	4
ENVG 20200 Mineralogy	4
ENVG 45200 Field Trip	1
And, one 4-credit and one 3-credit ENVG course.	

For CE majors, either CE 20500, Engineering Geology, or CE 40320, Environmental Chemistry, may count toward the ENVG minor and the CE major. For ENVG majors and College of Science Students, ENVG/SC 20110, Physical Geology, may count toward the major.

### Concentrations

Several College departments also offer concentrations, restricted to students within particular majors. Concentrations comprise a set of at least three 3-credit-hour courses focusing on a specific discipline, designed to give students greater depth of knowledge in that area. Concentrations may be completed within degree requirements, by selecting departmental and technical electives from pre-approved lists of courses. Please see each department's web site for more information. The list of currently approved concentrations includes:

#### Department of Aerospace & Mechanical Engineering

- Aerospace Engineering
- Bioengineering
- Computational Engineering
- Control and Mechanical Systems
- Design and Manufacturing
- Energy
- Materials
- Solid Mechanics
- Thermal and Fluid Sciences

#### Department of Civil and Environmental Engineering & Earth Sciences

- Hydraulics (Civil Engineers only)
- Structures (Civil Engineers only)

#### Department of Computer Science & Engineering

- Bioinformatics and Computational Biology
- Cloud Computing
- Media Computing
- Mobile Computing

#### Department of Electrical Engineering

- Biosystems
- Communications
- Energy
- Multimedia
- Semiconductors and Nanotechnology

## College Awards and Prizes

### COLLEGE OF ENGINEERING AWARDS

*The Rev. Thomas A. Steiner Prize.* From a fund established in 1948 by former students of Rev. Thomas A. Steiner, C.S.C., former dean of the College of Engineering, a cash award is made to seniors in the college who have been selected for their all-around excellence as students.

*The Reilly Scholar Designation.* The designation of Reilly Scholar is given annually to those fifth-year seniors enrolled in the dual Engineering/Arts and Letters program who have excelled academically and otherwise during their first four years as students.

*The Americo Darin Prize.* From a fund set up by the Darin family in their father's name, a cash award is made to several engineering juniors who have demonstrated exceptional and steady improvement over their first four semesters at Notre Dame.

## Departmental Awards

### AEROSPACE AND MECHANICAL ENGINEERING

*Patrick J. Deviny Award.* Presented each year to a junior aerospace student who has displayed the most diligence and persistence in the pursuit of undergraduate studies in aerospace engineering.

*Vincent P. Goddard Design Award.* Presented each year to a senior in aerospace engineering for outstanding performance in the aerospace design course.

*Sigma Gamma Tau Honor Award.* Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

*Pi Tau Sigma Honor Award.* Presented each year to a member of the Notre Dame chapter in recognition of outstanding academic performance and demonstrated professional potential.

*The Aero Propulsion Award.* Presented each year to a senior in aerospace engineering for outstanding performance in the Gas Turbine and Propulsion class.

*The Zahm Prize for Aeronautical Engineering* was founded in 1946 by Dr. Albert J. Zahm, distinguished pioneer in aeronautics and at one time professor of physics at the University of Notre Dame. The award is made to the senior aerospace engineering student who, in the estimation of the faculty of the program, has achieved the most distinguished record in professional subjects.

*The Zahm Prize for Mechanical Engineering.* Beginning with 2007–08 year, awarded to a senior mechanical major who, in estimations of the faculty, has achieved the most distinguished record in professional subject.

## DEPARTMENTAL AWARDS • STUDENT ORGANIZATIONS AND ACTIVITIES

*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

*AIChE Scholarship Award.* Presented to the junior chemical engineering student who has the highest scholastic average during the first two years of study.

*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.

*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.

## Student Organizations and Activities

### HONOR SOCIETIES

#### TAU BETA PI

In 1960, the Indiana Gamma Chapter of Tau Beta Pi was installed at Notre Dame to foster a spirit of liberal culture in the engineering college and to recognize those who have conferred honor upon Notre Dame by distinguished scholarship and exemplary character as undergraduates in engineering or by their attainment as alumni in the field of engineering. Seniors in the top fifth of their class and juniors in the top eighth of their class are eligible for election under rigid standards of scholarship, character, leadership, and service.

#### ETA KAPPA NU

In 1962, the Delta Sigma Chapter of Eta Kappa Nu, the national honor society for electrical engineers, was installed at Notre Dame. Juniors, seniors, and

alumni are elected to membership on the basis of scholastic attainment, leadership, and quality of character.

#### PI TAU SIGMA

In 1963, the Sigma Beta Chapter of Pi Tau Sigma, the national honor society for mechanical engineers, was installed at Notre Dame. Juniors, seniors, and alumni are elected to membership on the basis of scholastic attainment, leadership, quality of character, and a demonstration of probable future success in engineering.

#### CHI EPSILON

In 1966, the Notre Dame Chapter of Chi Epsilon, the national honor society for civil engineers, was installed at Notre Dame. Chi Epsilon recognizes those civil engineering students, faculty, and alumni who have displayed superior qualities in scholarship, character, practicality, and sociability during their professional careers.

#### SIGMA GAMMA TAU

In 1981, the Notre Dame Chapter of Sigma Gamma Tau, the national honor society for aerospace engineering 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

The several departments of the college actively support student chapters of their respective professional societies; these are:

American Institute of Aeronautics and Astronautics (AIAA)

American Institute of Chemical Engineers (AIChE)

American Society of Civil Engineers (ASCE)

American Society of Mechanical Engineers (ASME)

Association of Computer Machinery (ACM)

Institute of Electrical and Electronic Engineers (IEEE)

National Society of Black Engineers (NSBE)

Society of Hispanic Professional Engineers (SPHE)

Society of Women Engineers (SWE)

The Joint Engineering Council (JEC), 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 JEC sponsors activities of general interest to the engineering student body.

## Aerospace and Mechanical Engineering

### Chair:

Gretar Tryggvason

### Associate Chair:

Joseph M. Powers

*H. Clifford and Evelyn A. Brosey Professor of*

### Mechanical Engineering:

Frank P. Incropera

*Viola D. Hank Professor of Mechanical Engineering:*

Hafiz M. Atassi

Gretar Tryggvason

### Clark Professor:

Thomas C. Corke

*John Cardinal O'Hara, C.S.C. Assistant Professor of*

### Mechanical Engineering:

Arezoo Ardekani

### Professors:

Stephen M. Batill (emeritus); Raymond M. Brach (emeritus); Patrick F. Dunn; Edward W. Jerger (emeritus); Eric J. Jumper; Francis M. Kobayashi (emeritus); Stuart T. McComas (emeritus); Thomas J. Mueller (emeritus); Robert C. Nelson; Glen L. Niebur; Timothy C. Ovaert; Samuel Paolucci; Joseph M. Powers; Francis H. Raven (emeritus); Mihir Sen; Steven B. Skaar (emeritus); Steven R. Schmid; Albin A. Szweczyk (emeritus); Flint O. Thomas; Meng Wang; Kwang-tzu Yang (emeritus)

### Associate Professors:

J. William Goodwine Jr.; John W. Lucey (emeritus); Karel Matous; Scott C. Morris; Ryan K. Roeder; James P. Schmiedeler; Michael M. Stanisic

### Assistant Professors:

Hyungrok Do; David B. Go; David Hoelzle; James E. Houghton (emeritus); Gwendolyn Johnson; Tengfei Luo; Fabio Semperlotti; Philippe Sucusky

### Associate Professional Specialists:

Rodney L. McClain; John Ott; Richard B. Strebinger; Diane Wagner

**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; master of engineering for mechanical engineers; and doctor of philosophy.

**Program in Aerospace Engineering.** This program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The aerospace program is designed to prepare those students interested in the design and operation of aircraft and space vehicles for entrance into a professional career. The curriculum, based on a solid foundation in mathematics, physics, chemistry and the engineering sciences, places emphasis on such basic aerospace disciplines as aerodynamics and fluid mechanics, orbital mechanics, and solid and

structural mechanics, as well as such integrating disciplines as design, experimental methods and systems analysis. Technical specializations in the junior and senior year enable students to emphasize specific technical areas, including design and manufacturing, thermal and fluid sciences, bioengineering, solid mechanics, materials, control and mechanical systems and computational engineering.

The aerospace engineering program uses laboratories in Fitzpatrick Hall of Engineering and in the Hessert Laboratory for Aerospace Research. The Hessert laboratories contain superior facilities for instruction and research.

Students are encouraged to participate in the activities of the student chapter of the American Institute of Aeronautics and Astronautics and to enter the national student paper competition conducted by the parent institute. 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 London Program and electives can be found on the Web at [ame.nd.edu](http://ame.nd.edu).

### Aerospace Engineering Program Educational Objectives and Student Outcomes.

The Engineering Accreditation Commission of ABET encourages the explicit statement of the Program Educational Objectives and Learning Outcomes for all engineering programs. Publication of the objectives and desired outcomes, as well as efforts to determine if these are being achieved, are part of the process of continuous improvement in engineering education.

**Program Educational Objectives.** The Department of Aerospace and Mechanical Engineering has established the following Program Educational Objectives that are consistent with the mission of the University and College of Engineering. These objectives have been developed in collaboration with faculty, students, and industry representatives. Program Educational Objectives are "broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve." These are usually recognized as accomplishments in the first few years after graduation.

The aerospace engineering program at Notre Dame appreciates the diverse set of individual goals to which our students aspire, so it has expressed the Program Educational Objectives in two forms. Graduates of the program should:

- Secure a position consistent with their personal aspirations and qualifications
- Assume a technical or managerial leadership role with their organization
- Participate as a volunteer with at least one professional or social service organization

In addition, depending on the career path selected, graduates would be prepared to achieve one or more of the following:

- Be recognized as the key technical specialist within their organization for a particular professional specialty
- Receive a graduate or professional degree
- Start their own company
- Be granted a patent

**Student Learning Outcomes.** To achieve these Program Educational Objectives, the curriculum is designed to provide the following Student Learning Outcomes that describe what students are expected to know or be able to do by the time of graduation.

**First Principles and Problem Solving:** Graduates understand fundamental scientific first principles of engineering and can apply them to the solution of problems or systems by way of analytical and numerical treatment.

### Engineering Skills and Professional Practice:

Graduates understand the essential role of experimentation in engineering, and they are able to compare and gain insight from a combination of analytical, numerical, and experimental results. They are able to use modern engineering software tools, including CAD, and are capable of programming digital computers

**Design:** Graduates have a pragmatic understanding of design and the engineering design process and are able to contribute in various ways to the design of a product, system, or process.

**Communication:** Graduates are able to communicate well, both orally and in writing, and function effectively in multidisciplinary groups, both in leadership and support roles.

**Professional Responsibility:** Graduates are familiar with the responsibilities of professional practice, the roles that aerospace engineers play in society, the kinds of issues they deal with, and their influence in society.

### First Year of Studies

First-year students intending to major in aerospace engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

### Sophomore Year

#### First Semester

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
AME 20221. Mechanics I	3
AME 20211. Introduction to Aeronautics	3
AME 20214. Introduction to Engineering Computing	1
Arts and Letters course+	3



## AEROSPACE AND MECHANICAL ENGINEERING

*Second Semester*

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
AME 20222. Mechanics II	3
AME 20241. Solid Mechanics	4
AME 20231. Thermodynamics	3
AME 20213. Measurements and Data Analysis or AME 30361. Computer Aided Design and Manufacturing	4/3
	—
	17.5/16.5

**Junior Year***First Semester*

AME 30314. Differential Equations, Vibrations and Controls I	3
AME 20213. Measurements and Data Analysis or AME 30361. Computer Aided Design and Manufacturing	4/3
AME 30341. Aerospace Structures	3
AME 30331. Fluid Mechanics	3
Arts and Letters course+	3
	—
	16/15

*Second Semester*

AME 30315. Differential Equations, Vibrations and Controls II	3
AME 30333. Theoretical and Experimental Aerodynamics	4
AME 30332. Compressible Aerodynamics	3
AME 30334. Heat Transfer, or AME 30381. Orbital and Space Dynamics	3
Arts and Letters course+	3
	—
	16

**Senior Year***First Semester*

AME 40461. Flight Mechanics and Introduction to Design	3
AME 40451. Aerospace Dynamics	3
AME 40431. Gas Turbines and Propulsion Technical Specialization*	3
Arts and Letters course+	3
	—
	15

*Second Semester*

AME 30381. Orbital and Space Dynamics or AME 30334. Heat Transfer	3
AME 40462. Aerospace Design	4
Technical Specialization/Prof. Development	3
Technical Specialization	3
Arts and Letters course+	3
	—
	16

Total for the four years: 131 semester hours.

\*A list of approved technical specialization and professional development courses is available on the department website.

+ See "Arts and Letters Core" on the first page of the College of Engineering section.

The most current information for the degree program course requirements is available on the department website, [ame.nd.edu](http://ame.nd.edu).

**The Program in Mechanical Engineering.** This program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. 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. Elective course sequences are available in aerospace, design and manufacturing, thermal and fluid sciences, bioengineering, solid mechanics, materials, control and mechanical systems, and computational engineering.

To prepare for today's changing technological world, the program requires use of a computer in many of its courses.

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. 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 Program and electives can be found on the Web at [ame.nd.edu](http://ame.nd.edu). The program below pertains only to the Classes of 2015 and beyond. Prior class requirements are noted below.

**Mechanical Engineering Educational Objectives and Student Learning Outcomes.** The Engineering Accreditation Commission of ABET encourages the explicit statement of the Program Educational Objectives and Student Learning Outcomes for all engineering programs. Publication of the objectives and desired outcomes, as well as efforts to determine if these are being achieved, are part of the process of continuous improvement in engineering education.

**Program Educational Objectives.** The Department of Aerospace and Mechanical Engineering has established the following Program Educational Objectives that are consistent with the mission of the University and College of Engineering. These objectives have been developed in collaboration with faculty, students, and industry representatives. Program Educational Objectives are "broad statements that describe the career and professional accomplishments that the program is preparing the graduates to achieve." These are usually recognized as accomplishments in the first few years after graduation.

The mechanical engineering program at Notre Dame appreciates the diverse set of individual goals to which our students aspire, so it has expressed the educational objectives in two forms. Graduates of the program should:

- Secure a position consistent with their personal aspirations and qualifications
- Assume a technical or managerial leadership role with their organization
- Participate as a volunteer with at least one professional or social service organization

In addition, depending on the career path selected, graduates would be prepared to achieve one or more of the following:

- Be recognized as the key technical specialist within their organization for a particular professional specialty
- Receive a graduate or professional degree
- Start their own company
- Be granted a patent

**Student Learning Outcomes.** To achieve these Program Educational Objectives, the curriculum is designed to provide the following Student Learning Outcomes that describe what students are expected to know or be able to do by the time of graduation.

**First Principles and Problem Solving:** Graduates understand fundamental scientific first principles of engineering and can apply them to the solution of problems or systems by way of analytical and numerical treatment.

**Engineering Skills and Professional Practice:**

Graduates understand the essential role of experimentation in engineering, and they are able to compare and gain insight from a combination of analytical, numerical, and experimental results. They are able to use modern engineering software tools, including CAD, and are capable of programming digital computers, including microprocessors.

**Design:** Graduates have a pragmatic understanding of design and the engineering design process and are able to contribute in various ways to the design of a product, system, or process.

**Communication:** Graduates are able to communicate well, both orally and in writing, and function effectively in multidisciplinary groups, both in leadership and support roles.

**Professional Responsibility:** Graduates are familiar with the responsibilities of professional practice, the roles that mechanical engineers play in society, the kinds of issues they deal with, and their influence in society.

**First Year of Studies**

First-year students intending to major in mechanical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

## CHEMICAL AND BIOMOLECULAR ENGINEERING

**Sophomore Year***First Semester*

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
AME 20221. Mechanics I	3
CBE 30361. Science of Engineering Materials**	3
AME 20214. Introduction to Engineering Computing	1
Arts and Letters course+	3
	<hr/>
	17.5

*Second Semester*

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
AME 20222. Mechanics II	3
AME 20241. Solid Mechanics	4
AME 20213. Measurements and Data Analysis or AME 30361. Computer Aided Design and Manufacturing	4/3
AME 20231. Thermodynamics	3
	<hr/>
	17.5/16.5

**Junior Year***First Semester*

AME 30314. Differential Equations, Vibrations and Controls I	3
AME 20213. Measurements and Data Analysis or AME 30361 Computer Aided Design and Manufacturing	3
AME 30331. Fluid Mechanics	3
AME 40423. Mechanisms and Machines	3
Arts and Letters course+	3
	<hr/>
	16/15

*Second Semester*

AME 30315. Differential Equations, Vibrations and Controls II	3
AME 30334. Heat Transfer	3
AME 30363. Design of Machine Elements	3
EE 20222. Introduction to Electrical Engineering and Embedded Systems	4
Arts and Letters course+	3
	<hr/>
	16

**Senior Year***First Semester*

AME 30362. Design Methodology	3
AME Technical Elective**	3
AME Technical Elective	3
Technical Elective*	3
Arts and Letters course+	3
	<hr/>
	15

*Second Semester*

AME 40463. Senior Design Project	4
AME Elective	3
AME Elective	3
Technical Elective*	3
Arts and Letters course+	3
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	16

\*A list of approved AME and technical specialization courses is available on the department website.

+ See "Arts and Letters Core" on the first page of the College of Engineering section.

\*\*Students entering mechanical engineering prior to fall 2012 take AME 20212 in the sophomore year instead of CBE 30361, and CBE 30361 in the senior year instead of an additional AME technical elective.

The most current information for the degree program course requirements is available on the department website: ([ame.nd.edu](http://ame.nd.edu)).

Total for the four years: 131 semester hours.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Aerospace and Mechanical Engineering*. Course descriptions can be found by clicking on the subject code and course number in the search results.

A number of introductory graduate-level courses, described in the *Graduate School Bulletin of Information* and on the department website, are open to advanced undergraduates, with the permission of the department chair, to satisfy upper-level electives.

**Chemical and Biomolecular Engineering***Chair:*

Edward J. Maginn  
Anthony Early Professor of Energy and the Environment:

Eduardo E. Wolf  
Arthur J. Schmitt Professor of Chemical & Biomolecular Engineering:

Paul W. Bohn  
Bayer Corporation Professor of Engineering:

Hsueh-Chia Chang  
Bernard Keating-Crawford Professor of Engineering:

Joan F. Brennecke  
Dorini Family Professor of Energy Studies:

Edward J. Maginn  
Keating-Crawford Professor of Chemical & Biomolecular Engineering:

Mark A. Stadtherr

*Professors:*

Jeffrey C. Kantor; David T. Leighton Jr.; Mark J. McCready; Paul J. McGinn; William F. Schneider

*Associate Professors:*

Daive A. Hill; Y. Elaine Zhu

*Assistant Professors:*

Basar Z. Bilgicer; Ruilan Guo; Jason C. Hicks; William A. Phillip; Jeremiah J. Zartman

*Professional Specialist:*

Salma R. Saddawi

**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, master of science in chemical engineering, and doctor of philosophy. The program leading to the bachelor of science degree is accredited by the Engineering Accreditation Commission of ABET, Inc.

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 "green" process technologies that eliminate the use of dangerous solvents. 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 posed by these complex systems.

## CHEMICAL AND BIOMOLECULAR ENGINEERING

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 study of chemical engineering and to understand the complex scientific, social, and moral issues of the world today. Our intention in emphasizing fundamentals is to develop students' intellect and to 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 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 pursued, successfully, 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 use their electives to construct course sequences in materials, environmental chemical engineering 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 on the Web at [cbe.nd.edu](http://cbe.nd.edu). The program below pertains only to the Classes of 2013 and beyond.

**First Year of Studies**

First-year students intending to major in chemical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

**Sophomore Year***First Semester*

MATH 20550. Calculus III	3.5
CHEM 10172. Organic Chemistry	3
CHEM 11172. Organic Chemistry Lab I	1
PHYS 10320. General Physics II	4
CBE 20255. Introduction to Chemical Engineering Analysis	
or	
CBE 30385. Introduction to Bioengineering	3
Arts and Letters Course+	3
	<hr/>
	17.5

*Second Semester*

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
CHEM 20273. Organic Chemistry II	3
CBE 20260. Chemical Engineering Thermodynamics I	3
CBE 20258. Computer Methods in Chemical Engineering	3
CBE 20290. Career Choices for Engineers**	1
Arts and Letters course+	3
	<hr/>
	16.5

**Junior Year***First Semester*

MATH 30650. Differential Equations	3
CHEM 30333. Analytical Chemistry	2
CHEM 31333. Analytical Chemistry Lab	2
CBE 30361. Science of Engineering Materials	3
CBE 30355. Transport Phenomena I	
or	
CBE 30397. Biotransport	3
CBE 30367. Chemical Engineering Thermodynamics II	3
	<hr/>
	16

*Second Semester*

CHEM 30324. Physical Chemistry	3
CBE 30356. Transport Phenomena II	3
CBE 31358. Chemical Engineering Laboratory I	3
CBE 30338. Chemical Process Control	3
Arts and Letters course+	3
	<hr/>
	15

**Senior Year***First Semester*

CBE 41459. Chemical Engineering Laboratory II	3
CBE 40443. Separation Processes	3
CBE 40445. Chemical Reaction Engineering	3
Chemical Engineering Elective*	3
Arts and Letters course+	3
	<hr/>
	15

*Second Semester*

CBE 40448. Chemical Process Design	3
Chemical Engineering Elective*	3
Advanced Science Elective*	3
Technical Elective *	3
Arts and Letters course+	3
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	15

\* All electives are selected from a list available in the department office or found on the department website.

\*\* CBE 20290 is recommended in this semester but not required.

+ See "Arts and Letters Core" on the first page of the College of Engineering section.

Total for the four years: 129 semester hours.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- Chemical & Biomolecular Engineering
- Energy Studies

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.

## Civil and Environmental Engineering and Earth Sciences

### *Henry J. Massman Chair:*

Joannes J. Westerink

### *Associate Chairs:*

Yahya C. Kurama

### *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

### *Notre Dame Chair in Computational Hydraulics:*

Joannes J. Westerink

### *Professors:*

Jeremy B. Fein; Robert L. Irvine (emeritus);

Kenneth R. Lauer (emeritus); Patricia A.

Maurice; Clive R. Neal; James I. Taylor

(emeritus); Yahya C. Kurama; Stephen E.

Silliman (emeritus)

### *Associate Professors:*

Andrew Kennedy; Lloyd H. Ketchum Jr.

(emeritus); Tracy L. Kijewski-Correa; David J.

Kirkner (emeritus); Jerry J. Marley (emeritus);

Robert Nerenberg; Rev. James A. Rigert, C.S.C.

(emeritus); Alexandros Taflanidis; Joshua ShROUT;

Antonio Simonetti

### *Assistant Professors:*

Melissa Berke; Diogo Bolster; Alan Hamlet; Amy

Hixon; Kapil Khandelwal; George Mavroeidis;

Chongzheng Na; David Richter; Ashley Thrall

### *Assistant Professional Specialists:*

Elizabeth A. Kerr; Stefanie Simonetti; Brian

Smith

**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 geosciences (for students with sophomore status in or prior to the fall of 2012), bachelor of science in environmental engineering (for students with sophomore status in or after the fall of 2013), bachelor of science in environmental earth sciences (for students with sophomore status in or after the fall of 2013), master of science in civil engineering, master of science in geological sciences (for graduate students entering the program in or prior to the fall of 2012), master of science in environmental engineering, master of science in environmental earth sciences (for graduate students entering the program in or after the fall of 2013), and doctor of philosophy.

**Program Goals.** The Department of Civil and Environmental Engineering and Earth Sciences (CEEES) focuses on knowledge related to civil infrastructure, natural and manmade hazards, environment, energy, water, and planet systems. We emphasize a strong foundation in science

and engineering with a focus in the areas of structural engineering, environmental engineering, environmental fluid dynamics, and 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.

## CIVIL ENGINEERING

**Program in Civil Engineering (available to students with sophomore status or higher in Fall 2012).** This program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The department presents a well-rounded program for the bachelor's degree with the first two years devoted primarily to the basic principles of science and engineering. The third and fourth years are devoted to courses in the basic areas of civil engineering—structural analysis and design, hydraulics and hydrology, water supply and wastewater disposal, materials of construction, geotechnical engineering, and transportation engineering. A student may emphasize a particular area of interest by selecting either the environmental engineering and hydrology sequence or the structures sequence, and by the careful use of elective courses. Civil engineering electives in the senior year may be regular courses, individualized directed study or research courses. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

The program gives students 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 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.

Further details about the civil engineering and environmental geosciences programs may be found on the Web at [cees.nd.edu](http://cees.nd.edu).

### **First Year of Studies**

First-year students intending to major in civil engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

## CIVIL AND ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

**Sophomore Year***First Semester*

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
CE 20150. Statics	3
CE 20130. Methods of Civil Engineering I	3
Arts and Letters course+	3
CE 23601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	16.5

*Second Semester*

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
ACMS 30440. Probability and Statistics	3
AME 20241. Solid Mechanics	4
CE 20140. Methods of Civil Engineering II	2
CE 20500. Engineering Geology	3
CE 23601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	15.5

**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 33601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
	<hr/>
	15

*Second Semester*

CE 30160. Civil Engineering Materials	4
CE 30510. Intro to Geotech Engrg	4
CE 30210. Structural Analysis (Opt A)**	(3)
CE 30320. Water Treat and Chem. (Opt B)**	(3)
CE 30460. Fluid Mechanics	3
CE 33601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
	<hr/>
	17

**Senior Year***First Semester*

CE 40450. Hydraulics	3
CE 40250. Wobbly Structures or CE 40240 Structural Systems (Opt A)**	(3)
Free Elective (Opt B)**	(3)
CE 40270. Reinf. Concrete Design (Opt A)**	(4)
CE 40460. Groundwater Hydrology (Opt B)**	(4)
CE 43601. Chlg. & Innov. of CE Eng.	0
Civil Engineering Elective	3
Arts and Letters course+	3
	<hr/>
	16

*Second Semester*

CE 40620. Transportation Engineering	3
CE 40280. Structural Steel Design (Opt A)**	(4)
CE 40340. Wastewater Design (Opt B)**	(4)
CE 43601. Chlg. & Innov. of CE Eng.	0
Civil Engineering Elective	3
Technical Elective	3
Arts and Letters course+	3
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	16

Total degree required credits	130
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+See "Arts and Letters Core" on the first page of the College of Engineering section.

\*\*Note: Beginning in the spring semester of the junior year the student chooses to follow option A, the structural engineering concentration, or option B, the environmental engineering and water resources concentration. Each track is defined by the specialization courses shown. Note that, by an appropriate choice of electives, a student may complete both concentrations.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

**Program in Civil Engineering (available to students with sophomore status or lower in Fall 2013).** This program is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The department presents a well-rounded program for the bachelor's degree with the first two years devoted primarily to the basic principles of science and engineering. The third and fourth years are devoted to courses in the basic areas of civil engineering—structural analysis and design, hydraulics and hydrology, water supply and wastewater disposal, materials of construction, geotechnical engineering, and transportation engineering. A student may emphasize a particular area of interest by selecting either the structures or hydraulics concentrations. Civil engineering electives in the senior year may be regular courses, individualized directed study or research courses. The civil engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design projects to facilitate the student's understanding of the design process. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

The program provides a firm foundation in the many basic disciplines comprising the broad field of civil engineering. This is especially desirable, for often in the course of professional development the civil engineer is asked to coordinate the planning, design, and construction of highly complex systems and must use many or all of these disciplines.

The department has excellent facilities for research available to both graduate and undergraduate students. These facilities include a structural dynamics/structural control laboratory; a materials testing and structural research laboratory; a groundwater hydrology field laboratory; and a number of analytical laboratories for water, wastewater and hazardous waste treatment.

The professional aspects of civil engineering are emphasized and promoted by the activities of a student chapter of the American Society of Civil

Engineers, in which all students of the department are eligible and encouraged to participate. In addition, a junior class field trip examines major infrastructure projects and environmental systems including tall buildings, bridges, stadiums, transportation systems, navigations systems, flood protection works, clean water supply, and wastewater systems.

Further details about the civil engineering may be found on the Web at [cees.nd.edu](http://cees.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.

**Sophomore Year***First Semester*

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
CE 20150. Statics	3
CE 20110. Planet Earth	3
CE 30160. CE Materials	4
CE23601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	17.5

*Second Semester*

MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
ACMS 30440. Probability and Statistics	3
AME 20241. Solid Mechanics	4
CE 20600. Intro to CAD	2
CE 20230. Engineering Programming	1
CE 23601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
	<hr/>
	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 33601. Chlg. & Innov. of CE Eng.	0
CE 30460. Fluid Mechanics	3
	<hr/>
	15

*Second Semester*

CE 40270. Reinf. Concrete Design	4
CE 30510. Intro to Geotech Engrg	4
CE 40450. Hydraulics	3
CE 30150. Dynamics & Modeling	3
CE 33601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
	<hr/>
	17

## CIVIL AND ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

**Senior Year***First Semester*

CE 40520. Transportation or	
CE 40465. Mechanics of Env. Motions	3
Core Concentration Elective**	4
Core Concentration Elective or CE Elective**	3
CE Elective**	3
CE 40701. Principles of Practice	1
CE 43601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
	<hr/>
	17

*Second Semester*

CE 40702. Senior Design	3
Core Concentration Elective**	3
Technical Elective**	3
CE 43601. Chlg. & Innov. of CE Eng.	0
Arts and Letters course+	3
Arts and Letters course+	3
	<hr/>
	15
Total degree required credits	132

+See "Arts and Letters Core" 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.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

**ENVIRONMENTAL GEOSCIENCES**

This degree is administered by the College of Engineering and will only be available for students with sophomore status in or prior to the Fall of 2012.

**Program in Environmental Geosciences (available to students with sophomore status or higher in Fall 2012) (ENVG).** The ENVG program at Notre Dame was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education in the disciplines of earth and environmental science. The program provides a foundation in the physical sciences, with emphasis on processes that occur near or at the surface of Earth, and the impact of human activity on such processes. Students explore the geochemical, mineralogical and hydrological properties of Earth's crust, and develop an understanding of the interplay of natural processes such as mineral-water-rock-bacteria interactions, with anthropogenic issues such as transport of toxic heavy metals and safe disposal of nuclear waste.

The ENVG program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to

conduct independent research under faculty supervision during their senior year.

An undergraduate major in ENVG prepares a student for graduate study (M.S., Ph.D.) in many aspects of geology and environmental science, as well as for admission to a variety of professional schools. In addition, this program meets the criteria for graduates to become state-registered geologists in those states requiring such certification. Graduates with a B.S. degree may enter careers in diverse areas such as the National Park Service, industry, environmental consulting, and government research laboratories. An ENVG degree is also ideal background for those planning to teach in secondary schools at all levels.

Below you will see an example of the curriculum that can be followed by an incoming student who wishes to major in ENVG. However, the flexibility of our undergraduate program allows students to switch to ENVG if they have followed either an engineering or science track during their first or even their second year.

**First Year***First Semester*

ENVG 10110/20110. Physical Geology	4
MATH 10550. Calculus I <sup>1</sup>	4
CHEM 10121. General Chemistry I <sup>2</sup>	4
Arts and Letters course <sup>3</sup>	3
WR 13100/University Seminar <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	18

*Second Semester*

ENVG 20300. Global Change, Water, & Energy	3
MATH 10560. Calculus II <sup>1</sup>	4
CHEM 10122. General Chemistry II	3
PHYS 10310. Physics I	4
WR 13100/University Seminar <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	17

**Sophomore Year***First Semester*

ENVG 20200. Mineralogy & Optical Min.	4
PHYS 10320. Physics II	4
Arts and Letters course <sup>3</sup>	3
MATH 20550. Calculus III	3.5
	<hr/>
	14.5

*Second Semester*

ENVG 20120. Historical Geology	4
ENVG 20240. Ign. & Metamorphic Petrol.	4
MATH 20580. Linear Alg. Diff. Equations	3.5
Arts and Letters course <sup>3</sup>	3
ENVG 45200. Field Trip	1
	<hr/>
	15.5

**Junior Year***First Semester*

ENVG 30230. Sediment. and Stratigraphy	4
ENVG 40300. Geochemistry	3
Arts and Letters course <sup>3</sup>	3
Free Elective	3
Technical Elective <sup>4</sup>	3
	<hr/>
	16

*Second Semester*

ENVG 30400. Str. Geology & Rock Mech.	4
ENVG 30300. Surficial Proc. Surf. Hydrol.	3
MATH 20340. Introductory Statistics	3
Arts and Letters course <sup>3</sup>	3
ENVG 45200. Field Trip	1
	<hr/>
	14

**Senior Year***First Semester*

ENVG 40610. Remote Sensing	3
Technical Elective <sup>4</sup>	4
Technical Elective <sup>4</sup>	3
Technical Elective <sup>4</sup>	3
Arts and Letters course <sup>3</sup>	3
	<hr/>
	16

*Second Semester*

ENVG 40310. Env. Impact Res. Utilization	3
ENVG 40340. Water-Rock Interaction	3
ENVG 40360. Geomicrobiology	3
Technical Elective <sup>4</sup>	3
Technical Elective <sup>4</sup>	3
	<hr/>
	15

Total for the 4 years: 126 semester hours.

**Minor in Environmental Geosciences**

A minor in environmental geosciences requires the completion of 16 credit hours in geological sciences as follows.

ENVG 20110. Physical Geology + lab5	4
ENVG 20200. Mineralogy	4
ENVG 45200. Field Trip	1
ENVG Elective	4
ENVG Elective	3
	<hr/>
	16

1. Under special circumstances and with the approval of the ENVG director of undergraduate studies and the College's Assistant Dean for Academic Affairs, MATH 10250 may be an acceptable substitute for MATH 10550, and the sequence MATH 10350-10360 may be considered as an acceptable substitute for MATH 10550-10560.

2. CHEM 10181 or CHEM 10171 may be substituted for CHEM 10121; CHEM 10172 or 10182 may be substituted for CHEM 10122. Other substitutions will be considered on a case-by-case basis.

3. See "Arts and Letters Core" on the first page of the College of Engineering section.

4. Technical Electives are typically junior and senior level courses in science or engineering that have

## CIVIL AND ENVIRONMENTAL ENGINEERING AND EARTH SCIENCES

been approved by the chair of Civil Engineering & Geological Sciences. Other courses must receive departmental approval. Students must ensure they have met prerequisite requirements for Technical Elective courses.

5. ENVG 20110 Physical Geology can also count towards credits for the students' major as well as the ENVG minor.

For Civil Engineering majors, either CE 20500 Engineering Geology or CE 40320 Environmental Chemistry may count towards the ENVG minor (but not both) and the CE major.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

## ENVIRONMENTAL ENGINEERING

### Program in Environmental Engineering (available to students with sophomore status or lower in Fall 2013).

The Environmental Engineering program at Notre Dame will be seeking accreditation by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. This program was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education regarding the assessment and remediation of human impact on our environment. It is a unique program that prepares students to look at all aspects of water and environmental problems from a range of perspectives including the Earth system, water movement (hydrology, fluid flow), environmental chemistry, geochemistry, and reactive transport. The Environmental Engineering degree program will prepare students to understand the necessary foundational chemistry, fluid flow and mixing mechanics, all within the context of the Earth system.

The environmental engineering program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to conduct independent research under faculty supervision during their junior and senior years. The environmental engineering program will culminate with major design experience in the senior year. Student teams will work closely with industry professionals and faculty who act as consultants on a real-world design projects to facilitate the student's understanding of the design process. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

The 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.

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 [cees.nd.edu](http://cees.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.

### Sophomore Year

<i>First Semester</i>	
ENVG 20110. Planet Earth w/ lab	4
PHYS 10320. Physics II	4
CE 30300. Intro to Env. Eng w/lab	4
MATH 20550: Calculus III	3,5
CE 20150. Statics	3
CE 23601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	18.5

### Second Semester

ENVG 20300. Global Chg, Water & Energ.	3
ENVG 40230. Env. Aquatic Chem	3
MATH 20580. Linear Alg. Diff. Equations	3,5
ACMS 30440. Prob. & Stats.	3
Arts and Letters course+	3
CE 20230: Engineering Programming	1
CE 23601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	16.5

### Junior Year

<i>First Semester</i>	
CE 30455. Env. Hydrology	3
CE 30125. Comp. Methods	3
ENVG 20200. Env. Mineralogy	3
ENVG 45300. Fluid Mechanics	3
Arts and Letters course+	3
CE 33601. Chlg. & Innov. of CE Eng.	0
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	15

### Second Semester

CE 30320. Water Quality & Treatment	3
CE 40450. Hydraulics	3
CE 40350. Env. Microbiology	3
Technical Elective	3
Arts and Letters course+	3
CE 33601. Chlg. & Innov. of CE Eng.	0
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	15

### Senior Year

<i>First Semester</i>	
CE 40341. Biological Process Design	3
ENVG 40300. Geochemistry	3
CE 40460. Groundwater Hydrology	4
CE 40355. Water, Disease & Global Health	
or	
CE 40350. Environmental Microbiology	3
CE 40701. Principles of Practice	1
Arts and Letters course+	3
CE 43601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	17

### Second Semester

CE 30510. Geotechnical Engineering	4
CE 40420. Reactive Transport	3
CE 40702. Senior Design	3
Technical Elective	3
Arts and Letters course+	3
CE 43601. Chlg. & Innov. of CE Eng.	0
	<hr/>
	16

Total credit hours required for degree 132

## ENVIRONMENTAL EARTH SCIENCES

### Program in Environmental Earth Sciences

(available to students with sophomore status or lower in Fall 2013). The Environmental Earth Sciences program at Notre Dame was founded by the Department of Civil and Environmental Engineering and Earth Sciences to provide students with a quantitative preparation for professional careers or continued higher education in the disciplines of the earth and environmental science. This degree program blends the disciplines of fluid dynamics and hydrology, environmental chemistry and geochemistry framed within the larger context of Earth systems and focuses more on the geology side of the environment and planetary systems. The program provides a foundation in the physical sciences, with emphasis on processes that occur near or at the surface of Earth, and the impact of human activity on such processes. Students explore the geochemical, mineralogical and hydrological properties of Earth's crust, and develop an understanding of the interplay of natural processes such as mineral-water-rock-bacteria interactions, with anthropogenic issues such as transport of toxic heavy metals and safe disposal of nuclear waste.

The environmental earth sciences program combines classroom, laboratory and field studies. Students are encouraged to participate in a semester study abroad, such as the Australia program (during the fall semester, junior year), which provides additional opportunity for field-based studies. All students are encouraged to conduct independent research under faculty supervision during their senior year. Additionally, the curriculum for all programs in the CEEES department requires students to take the Challenges and Innovation Seminar series which brings in top engineering professionals from industry, consulting, academia, and government to discuss major problems of interest and their solutions.

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An undergraduate major in Environmental Earth Sciences prepares a student for graduate study (M.S., Ph.D.) in many aspects of earth science and environmental science and engineering, as well as for admission to a variety of professional schools. Graduates with a B.S. degree may enter careers in diverse areas such as the National Park Service, industry, environmental consulting, and government research laboratories. An Environmental Earth Science degree is also ideal background for those planning to teach in secondary schools at all levels.

Below you will see an example of the curriculum that can be followed by an incoming student who wishes to major in environmental earth sciences. However, the flexibility of our undergraduate program allows students to switch to environmental earth sciences if they have followed either an engineering or science track during their first year.

Further details about the environmental earth sciences program may be found on the Web at [cees.nd.edu](http://cees.nd.edu).

**First Year of Studies**

First-year students intending to major in environmental earth sciences when they become sophomores will find first-year course requirements on the first page of the College of Engineering section. EG10111 and EG 10112 are not required for the Environmental Earth Sciences major. Other approved courses may be substituted. For approval, please contact the Director of Undergraduate Studies of the CEEES Dept.

**Sophomore Year***First Semester*

ENVG 20110. Planet Earth w/ lab	4
PHYS 10320. Physics II	4
CE 30300. Intro to Env. Eng w/lab	4
MATH 20550. Calculus III	3.5
CE 23601. Chlg. & Innov. of CE Eng.	0
	15.5

*Second Semester*

ENVG 20300. Global Chg, Water & Energ.	3
ENVG 40230. Env. Aquatic Chem	3
MATH 20580. Linear Alg. Diff. Equations	3.5
ACMS 30440. Prob. & Stats.	3
Arts and Letters course+	3
CE 20230. Engineering Programming	1
CE 23601. Chlg. & Innov. of CE Eng.	0
	16.5

**Junior Year***First Semester*

CE 30455. Env. Hydrology	3
CE 30125. Comp. Methods	3
ENVG 20200. Env. Mineralogy	3
ENVG 45300. Fall Field Trip	1
Core Elective	3
Arts and Letters course+	3
CE 33601. Chlg. & Innov. of CE Eng.	0
	16

*Second Semester*

ENVG 30240. Petr. Of Earth Matls	4
ENVG 30410. Dynamic Earth	3
ENVG 45200. Field Trip	1
CE 40350. Env. Microbiology	3
Technical Elective	3
Arts and Letters course+	3
CE 33601. Chlg. & Innov. of CE Eng.	0
	17

**Senior Year***First Semester*

ENVG 40300. Geochemistry	3
CE 40460. Groundwater Hydrology	4
Technical Elective	3
Technical Elective	3
Arts and Letters course+	3
CE 43601. Chlg. & Innov. of CE Eng.	0
	16

*Second Semester*

Core Elective	3
Core Elective	3
Core Elective	3
Technical Elective	3
Arts and Letters course+	3
CE 43601. Chlg. & Innov. of CE Eng.	0
	15
Total credits required for degree	130

+See "Arts and Letters Core" on the first page of the College of Engineering section.

**\*\*Note:** Beginning in the spring semester of the junior year the student chooses to follow option A, the structural engineering concentration, or option B, the environmental engineering and water resources concentration. Each track is defined by the specialization courses shown. Note that, by an appropriate choice of electives, a student may complete both concentrations.

Certain graduate courses are open to advanced undergraduates with permission of the department chair.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting one or more of the following subjects:

- Civil Engineering
- Environmental Geosciences

Course descriptions can be found by clicking on the subject code and course number in the search results.

## Computer Science and Engineering

*Schubmehl/Prein Professor and Department Chair of Computer Science and Engineering:*

Kevin W. Bowyer

*Ted H. McCourtney Professor of Computer Science and Engineering:*

Peter M. Kogge

*Professors:*

Steven C. Bass (emeritus); Danny Z. Chen;

Patrick Flynn; Eugene W. Henry (emeritus);

X. Sharon Hu; John J. Uhran Jr. (emeritus)

*Research Professor:*

Gregory R. Madey

*Frank Freimann Collegiate Associate Professor of Computer Science and Engineering:*

Nitesh Chawla

*Associate Professors:*

Jay B. Brockman; Jesús A. Izaguirre; Michael

Niemier; Christian Poellabauer; Aaron Striegel;

Douglas Thain

*Clare Boothe Luce Assistant Professor:*

Laurel D. Riek

*Assistant Professors:*

Marina Blanton; Sidney D'Mello; Scott Emrich;

Collin McMillan; Tijana Milenkovic; Raul

Santelices; Timothy Weninger

*Associate Professional Specialists:*

Ramzi K. Bualuan; J. Curt Freeland

**Program of Studies.** The Department of Computer Science and Engineering offers programs of study that lead to the degrees of bachelor of science in computer science and bachelor of science in computer engineering. The program in computer engineering is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>. The program in computer science is accredited by the Computing Accreditation Commission of ABET, <http://www.abet.org>. The department also offers programs that lead to a master of science in computer science and engineering, and a Ph.D.

**Educational Goals.** The goals of the programs in computer science and computer engineering are (1) to prepare all students for careers in the public or private sector; (2) to prepare outstanding students for graduate study; (3) to develop lifelong learning skills in all students; (4) to provide comprehensive education in computer science, including theoretical foundations, software and hardware systems, and applications; and (5) to ensure significant design experience including working in teams.

**Program Outcomes.** At the time of completion of the undergraduate program, all graduates should possess (1) the ability to specify, design, test, and document software; (2) an understanding of current computer software and hardware technology; (3) an understanding of science, engineering, and mathematics; (4) a comprehensive general education; (5) the ability to continue learning in response to professional needs as well as personal desire for



## COMPUTER SCIENCE AND ENGINEERING

self-improvement; and (6) an understanding of personal and professional responsibility to society.

**Programs.** Programs in the Department of Computer Science and Engineering follow the four-year curricula listed below. These include required and elective courses in the basic, pure, and applied sciences, as well as the humanities, electrical engineering, computer science, and computer engineering. Emphasis is on developing a mastery of the key principles underlying the organization, operation, and application of modern computers to real problems, with a solid grounding in math and science to permit a quantitative analysis of such solutions. In addition, central to both programs is the development of the ability to function, both independently and in multidisciplinary teams, and to be prepared for continued change in future computing technology and what effects it will have on all aspects of society. Opportunities for specialization in several professional computer disciplines are available. Students are individually assisted and advised in their choices of elective courses.

The Department of Computer Science and Engineering offers concentrations in four areas: Bioinformatics and Computational Biology, Media Computing, Mobile Computing, and Cloud Computing. 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](http://cse.nd.edu).

**PROGRAM IN COMPUTER ENGINEERING**

The Program in Computer Engineering focuses on understanding the basic nature of the electronic devices that go into the creation of modern computers and on the detailed architecture and organization of such systems, both within the central processing unit and in how larger systems are assembled. Modern design tools and techniques are introduced very early in the program and used throughout to design, analyze, and prototype real digital computing systems. All computer engineering students are required to enroll in at least one of a prescribed set of design courses before graduation.

**PROGRAM IN COMPUTER SCIENCE**

The Program in Computer Science focuses on the application of computers to real problems, especially in the design, development, and use of software. The program is designed to foster an understanding of the key properties of algorithms (the mathematical statements of how problems are to be solved), and how to recognize and design good algorithms to solve real problems in efficient 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.

**First Year of Studies**

First-year students intending to major in computer engineering or in computer science when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

**COMPUTER ENGINEERING PROGRAM****Sophomore Year***First Semester*

CSE 20211. Fundamentals of Computing I	4
CSE 20110. Discrete Mathematics	3
MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
Arts and Letters course +	3
	<hr/>
	17.5

*Second Semester*

CSE 20189. Basic Unix †	3
CSE 20212. Fundamentals of Computing II	4
CSE 20221. Logic Design	4
MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
Arts and Letters course +	3
	<hr/>
	17.5

**Junior Year***First Semester*

CSE 30331. Data Structures	3
CSE 30321. Computer Architecture I	4
EE 20224. Introduction to Electrical Engineering	4
Free Elective	3
Arts and Letters course +	3
	<hr/>
	17

*Second Semester*

EE 20242. Electronics I	4
CSE 30341. Operating System Principles	3
EE 20234. Electric Circuits	3
ACMS 30440. Probability and Statistics	3
Arts and Letters course +	3
	<hr/>
	16

**Senior Year***First Semester*

EE 30344. Signals and Systems I	3
CSE Electives*	9
Free Elective	3
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	15

*Second Semester*

CSE 40522. CPEG Capstone	4
CSE 40175. Ethics and Professional Issues	3
CSE Elective*	3
Arts and Letters course+	3
	<hr/>
	13

Total Program Credits: 130

**COMPUTER SCIENCE PROGRAM****Sophomore Year***First Semester*

CSE 20211. Fundamentals of Computing I	4
CSE 20110. Discrete Mathematics	3
MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
Arts and Letters course+	3
	<hr/>
	17.5

*Second Semester*

CSE 20212. Fundamentals of Computing II	4
CSE 20221. Logic Design	4
MATH 20580. Introduction to Linear Algebra and Differential Equations	3.5
CSE 20189. Basic Unix	3
Arts and Letters course+	3
	<hr/>
	17.5

**Junior Year***First Semester*

CSE 30331. Data Structures	3
CSE 30321. Computer Architecture I	4
CSE Elective*	3
Technical Elective	3
Arts and Letters course +	3
	<hr/>
	16

*Second Semester*

CSE 30151. Theory of Computing	3
CSE 30341. Operating System Principles	3
CSE 30332. Programming Paradigms	3
ACMS 30440. Probability and Statistics	3
Arts and Letters course +	3
	<hr/>
	15

**Senior Year***First Semester*

CSE 40113. Algorithms	3
CSE Electives*	6
Technical Elective	3
Free Elective	3
	<hr/>
	15

*Second Semester*

CSE 40175. Ethics and Professional Issues	3
CSE Electives*	6
Arts and Letters course+	3
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	12

Total Program Credits: 127

+ See "Arts and Letters Core" on the first page of the College of Engineering section.

\* These courses must be selected from a list approved by the department. For computer engineering, at least one must be a designated design course.

† Students graduating with the class of 2014 may substitute a technical elective for this course.

## ELECTRICAL ENGINEERING

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject *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:*

Thomas E. Fuja

*H.C. and E.A. Brosey Professor of Electrical Engineering:*

Panagiotis J. Antsaklis

*Leonard Bettex Chair of Electrical Engineering:*

Daniel J. Costello Jr. (emeritus)

*Frank M. Freimann Professor of Electrical Engineering:*

Gary H. Bernstein

Bertrand Hochwald

Craig Lent

Ruey-wen Liu (emeritus)

James L. Merz (emeritus)

Anthony N. Michel (emeritus)

Wolfgang Porod

*Keough-Hesburgh Chair in Electrical Engineering and Biological Sciences:*

Gregory Timp

*John Cardinal O'Hara, C.S.C. Professor of Electrical Engineering:*

Huili (Grace) Xing

*Professors:*

Peter H. Bauer; William B. Berry (emeritus);

Patrick J. Fay; Martin Haenggi; Eugene W.

Henry (emeritus); Yih-Fang Huang; Joseph

C. Hogan (emeritus); Debdeep Jena; Michael

D. Lemmon; Christine M. Maziar; Alan

C. Seabaugh; Gregory L. Snider; Robert L.

Stevenson; John J. Uhran Jr. (emeritus)

*Associate Professors:*

Vijay Gupta; Douglas C. Hall; Thomas H. Kosel

(emeritus); J. Nicholas Laneman; Ken D. Sauer;

Roxana Smarandache

*Assistant Professors:*

Anthony Hoffman; Scott Howard; Hai Lin; Lei

Liu; Paolo Minero; Mark Wistey

*Research Professors:*

Alexander Mintairov; Alexei Orlov

*Research Associate Professor:*

Gyorgy Csaba; Thomas Pratt; Sergei Rouvimov

*Research Assistant Professors:*

Susan Fullerton; Vladimir Protasenko

*Professional Specialist:*

R. Michael Schafer

*Concurrent Faculty:*

Kevin Bowyer; Jay Brockman; Patrick Flynn;

Sharon Hu

**Statement of Goals and Objectives.** The goals of the Department of Electrical Engineering's academic programs are to provide quality education and to foster leading-edge research as means of training highly qualified engineers and leaders of tomorrow, in keeping with the mission of the University of Notre Dame. The educational objectives through which this goal is met are:

- Graduates will successfully participate in the electrical engineering profession.
- Graduates will enroll in and complete high quality MS, PhD, JD, MBA and MD programs.

- Graduates will exploit the breadth in their education to secure a diverse set of initial positions and will demonstrate professional agility in adapting to varied career paths and changing professional landscapes.

**Program of Studies.** The Department of Electrical Engineering offers programs of study that lead to the degrees of bachelor of science and master of science in electrical engineering and doctor of philosophy. The program leading to the bachelor of science degree is accredited by the Engineering Accreditation Commission of ABET, <http://www.abet.org>.

**Program in Electrical Engineering.** The four-year curriculum, listed below, includes required and elective courses in the pure and applied sciences, the humanities, and electrical engineering. Emphasis is on the mastery of fundamental principles, with added depth and provision for specialization in the major professional areas of communications, control systems, electronic circuits, design and analysis, microelectronics and integrated circuits, fabrication, photonics, and signal image processing. Students are individually assisted and advised in their choices of elective courses. Departmental facilities include laboratories for electronics, circuits, electrophysics, control systems, communications, integrated circuit fabrication, photonics, microwave circuit/device characterization, and digital signal/image processing.

Further details about the electrical engineering program may be found on the Web at [ee.nd.edu](http://ee.nd.edu).

**First Year of Studies**

First-year students intending to major in electrical engineering when they become sophomores will find first-year course requirements on the first page of the College of Engineering section.

**Sophomore Year***First Semester*

MATH 20550. Calculus III	3.5
PHYS 10320. General Physics II	4
CSE 20232. C/C++ Programming	3
EE 20224. Introduction to Electrical Engineering	4
Arts and Letters course+	3
	<hr/>
	17.5

*Second Semester*

MATH 20580: Introduction to Linear Algebra and Differential Equations	3.5
PHYS 20330. General Physics III	3.5
EE 20242. Electronics I	4
EE 20234. Electric Circuits	3
CSE 20221. Logic Design	4
	<hr/>
	18

**Junior Year***First Semester*

MATH 30650. Differential Equations	3
EE 30344. Signals and Systems I	3
EE 30347. Semiconductors I	3
EE 30348. Electromagnetic Fields and Waves I	3
Arts and Letters course+	3
	<hr/>

## INTERDEPARTMENTAL ENGINEERING

<i>Second Semester</i>	
EE 30363. Random Phenomena in EE	3
Electrical Engineering Electives*	6
Technical Elective	3
Arts and Letters course+	3
	15

<b>Senior Year</b>	
<i>First Semester</i>	
EE 41430. Senior Design I	3
Electrical Engineering Electives*	6
Engineering Science Elective†	3
Arts and Letters course+	3
	15

<i>Second Semester</i>	
EE 41440. Senior Design II	3
Electrical Engineering Electives*	6
Technical Elective†	3
Arts and Letters course+	3
	15

Total for four years: 129.5 semester hours.

\* At least one electrical engineering elective must be chosen from EE 30342, 40446, 40455, 40458, and 40468.

+ See "Arts and Letters Core" on the first page of the College of Engineering section of the Electrical Engineering website.

† The engineering science and technical elective course lists may be found on the Electrical Engineering website.

## COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Electrical Engineering*. 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 of the department chair.

## Interdepartmental Engineering

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *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:

Cathy Pieronek
Associate Dean
College of Engineering
Ava Preacher
Assistant Dean
College of Arts and Letters

**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

Philosophy	6
Theology	6
Writing and Rhetoric	3
University Seminar+	(3)
History	3
Social Science	3
Literature or Fine Arts	3
Mathematics (MATH 10550, 10560)	8
Science (CHEM 10171, 10122)	7
	39

#### Arts and Letters Requirements

CSEM 23101	3
Literature or Fine Arts*	3
History or Social Science*	3
Language**	6/9
Major (minimum)	27
	42/45

#### Engineering Requirements

MATH 20550, 20580	7
PHYS 10310, 10320	8
EG 10111, 10112	6
	21

#### Engineering Program

Engineering degree program (required courses and program or technical electives) 66/72

Total : 168/177

#### 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
Physical Education	—
	17

#### 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
Physical Education	—
	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
CSEM 23101. 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

## DUAL DEGREE PROGRAMS

<i>Sixth Semester</i>	
Philosophy/Theology	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
<hr/>	
	18

<i>Seventh Semester</i>	
Literature*	3
History/Social Science	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
<hr/>	
	18

<i>Eighth Semester</i>	
Fine Arts*	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
<hr/>	
	18

<i>Ninth Semester</i>	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
<hr/>	
	18

<i>Tenth Semester</i>	
Engineering Program	3
Engineering Program	3
Engineering Program	3
Engineering Program	3
Arts and Letters Major	3
Arts and Letters Major	3
<hr/>	
	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.*

\* *The University degree requirement is one course in literature or fine arts and one each in history and social science. The College of Arts and Letters requires a minimum of one course in each subject area, plus one additional course in history or social science.*

\*\* *Two courses in the intermediate or advanced series complete the requirement. Beginning or elementary series require three semesters' work to fulfill the language requirement.*

† *Courses specified by the student's major engineering department.*

†† *Courses necessary to fulfill the requirements for a major in the student's major arts and letters department.*

### DUAL DEGREE PROGRAM WITH THE COLLEGE OF SCIENCE

#### Coordinators:

Cathy Pieronek  
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.

#### Approved Math Sequences:

- MATH 10550, 10560, 20550, 20580, 30650  
*CE, CHEG, EE*
- 1a. MATH 10550, 10560, 20550, 20580  
*AERO, CPEG, CS, EVEG, EVES, ME*
- MATH 10550, 10560, 20610, 20750
- MATH 10550, 10560, ACMS 20550, 20750, 20620
- MATH 10550, 10560, 20550, PHYS 20451, 20452

#### Approved Chemistry Sequences:

- CHEM 10171/11171, 10122  
*All EG (except CHEG)*
- CHEM 10171/11171, 10122, 10172/11172, 20273  
*CHEG*
- CHEM 10171/11171, 10172/11172
- CHEM 10181/11181, 10182/11182, 20283/22283, 20284/22284

#### Approved Physics Sequences:

- PHYS 10310, 10320  
*All EG (except EE)*
- PHYS 10310, 10320, 20330  
*EE*
- PHYS 10411, 10424, 20435, 20464

### DUAL DEGREE PROGRAM WITH THE MENDOZA COLLEGE OF BUSINESS

#### Coordinators:

Brian Lohr  
Director of Admissions  
Master of Business Administration Program  
Cathy Pieronek  
Associate Dean  
College of Engineering

**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

## DUAL DEGREE PROGRAMS

	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.

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 (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 (Floating Optional Elective)	2

##### Second Semester, Module 3:

Free Elective	2
Free Elective (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
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##### Second Semester, Module 4:

Free Elective	2
Free Elective (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

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.

## Officers of Administration

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*Chair of the Department of Electrical Engineering*

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# 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 Hurley 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. The facilities include controlled-environment rooms; an optics facility containing confocal microscopes, scanning and transmission electron microscopes; molecular analysis facilities for DNA sequencing, microarrays, cell sorting; and extensive data storage and retrieval equipment.

The Hank Center for Environmental Science provides more than 20,000 square feet of state-of-the-art research space for aquatic, terrestrial, and environmental studies that includes greenhouses, wet laboratories, and a field sample processing room.

The Freimann Life Science Center provides additional laboratories, vertebrate animal care, and associated specialized modern research facilities to serve the expanding needs of life science research at Notre Dame.

The Jordan Hall of Science contains 16 state-of-the-art biology laboratories for teaching undergraduate and graduate life science laboratory courses. In addition, the collections of museum specimens, including the Greene-Nieuwland Herbarium and the Museum of Biodiversity, are available for research and teaching, housed in superb facilities in Jordan Hall.

**The Department of Chemistry and Biochemistry**, located in Nieuwland Science Hall and Stepan Hall of Chemistry and Biochemistry, has laboratories devoted to research in several areas of chemistry: physical, inorganic, organic, and biochemistry. The laboratories are equipped with all necessary facilities for undergraduate students, graduate students, postdoctoral investigators, and faculty. Undergraduate researchers have access to seven high-field NMR spectrometers and three state-of-the-art single crystal X-ray diffractometers, plus many other pieces of equipment such as infrared, ultraviolet, Raman, mass spectrometer; photoelectron spectroscopy; potentiostats; analytical and preparative HPLC and GC equipment; special apparatus for studying mechanisms and rates of reactions; and cell culture facilities. For theoretical work, two large parallel cluster supercomputers are available. The facilities of the Radiation Research Laboratory are used by some faculty of the chemistry department for research in physical chemistry.

The new Jordan Hall of Science houses all of the undergraduate teaching laboratories for chemistry and biochemistry. Included are spacious facilities for introductory and organic chemistry; analytical, physical, and inorganic chemistry; and biochemistry. The building also contains a new NMR spectrometer. Also within Jordan Hall are two large lecture rooms specially designed for teaching introductory science courses, along with a 150-seat multimedia visualization center.

**The Department of Mathematics** is housed in Hayes-Healy Center/Hurley Hall, conveniently located in central campus. The facilities for undergraduate and graduate instruction and research in mathematics include a first-rate research library; a faculty room; offices for the faculty, postdoctoral investigators, and other visitors, graduate students, and staff; several research seminar and conference rooms; and several large classrooms with state-of-the-art media capability.

**The Department of Physics**, located in Nieuwland Science Hall, has classrooms 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 Structure Laboratory has a tandem accelerator with a heavy ion capacity and all necessary detection equipment. A variety of solid state facilities are available for

the study of metals, high T<sub>c</sub> 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.

The new Jordan Hall of Science houses all of the undergraduate teaching laboratories for physics, including spacious facilities for introductory mechanics, electricity and magnetism, and modern physics. Within Jordan Hall are also a laser and optics lab and an advanced laboratory for physics majors. The building also hosts a rooftop observatory equipped with a dozen small telescopes for introductory astronomy courses, along with a separate dome housing a large, research-quality telescope for physics and astronomy students. Jordan Hall is also home to a 150-seat digital visualization theatre that serves as a planetarium for a variety of astronomy and astrophysics courses.

**The Department of Preprofessional Studies** is located in the Center for Health Sciences Advising in the Jordan Hall of Science. This center centralizes the advising process for all University students interested in the health professions. All courses for students enrolled in the preprofessional program and collegiate sequence programs are provided by the other departments of the College of Science and the other colleges of the University.

## Undergraduate Education

The aim of the program of undergraduate education in the College of Science is to produce intellectually able graduates who are grounded in the broad fundamental principles of the basic sciences, versed in the advanced concepts of their chosen scientific discipline and educated in the humanistic and social studies. Each graduate should be a good scientist in his or her own field; a fully developed person, aware of his or her responsibilities to society and prepared to participate fruitfully in the affairs of society.

Education in science at Notre Dame is a coordinated program involving the basic sciences, the chosen advanced science, and the humanistic and social



## CURRICULA AND DEGREES

studies, including theology and philosophy. In this education, the student should acquire a thorough, integrated, and broad understanding of the fundamental knowledge in his or her field, a competence in orderly analytical thinking, and the capacity to communicate ideas to others, orally and in writing. This system of education is so arranged to develop in each student the desire and habit of continuing to learn after graduation, advancing over the years to higher levels of professional and personal stature and keeping abreast of the changing knowledge and problems of his or her profession.

Emphasis is placed on fundamental principles so that the students can develop abilities to apply these principles to the solution of new problems never before encountered by society, to the discovery of new things and to the invention of devices not learned about in books. Notre Dame stresses basic concepts useful in later learning rather than masses of particular facts and data that can better be found in books at the time of need.

## Curricula and Degrees

The College of Science offers curricula leading to the degree of bachelor of science in each of five 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  
 Biological Sciences  
 Chemistry  
 Chemistry combined with Business  
 Chemistry combined with Computing  
 Environmental Sciences  
 Mathematics  
 Mathematics (combined with other programs)  
 Physics  
 Physics (combined with other programs)  
 Preprofessional Studies  
 Science-Business  
 Science-Computing  
 Science-Education  
 Statistics

These degree programs are described in detail in later sections of this *Bulletin*.

See also the bachelor of science degree programs offered by the College of Engineering:

Computer Science  
 Environmental Geosciences

Each College of Science student must enroll in the department of his or her major beginning with the sophomore year; however, a student may freely change primary majors in the College of Science at any point up until the last drop day of the fall semester of the senior year. Concentrations, second and supplementary majors, and minors may be changed at any time.

The College of Science maintains a website at [science.nd.edu](http://science.nd.edu). Further information related to programs offered by the college may be found at that location.

Listed below are the allowed options for students interested in double science majors, double majors between colleges, second majors in the College of Science, and supplementary majors and minors in the College of Arts and Letters.

Students pursuing one of these combination programs must have superior scholastic ability and be formally accepted by the dean of both colleges involved. Approval will not be granted if there is substantial overlap between the two programs.

*Note:* Courses taken toward the completion of an additional major, supplementary major or minor may not also be counted toward the student's other major, supplemental major, supplemental major or minor.

**Double Science Majors.** In certain instances, students will have the option of pursuing majors in two departments of the College of Science. Details on the double science major option and lists of combinations that are normally approved are found under "Special Programs," later in this section of the *Bulletin*.

**Dual Degree.** Notre Dame students pursuing majors in two of the undergraduate colleges may qualify for a five-year dual-degree program.

The requirements for a dual degree generally are as follows: The student completes all of the university requirements, all of the requirements for both colleges, all of the requirements for both majors, and the total number of degree credits specified for a dual degree in the two colleges. While the total number of hours required does depend on the two major programs, the minimum required total number of degree credits is set to be 30 degree credits beyond the college total for the college with the greatest required number of degree credits.

**Double Majors in Two Colleges.** Qualified Notre Dame students pursuing majors in one of the other undergraduate colleges or schools may add another major in the College of Science. Additionally, qualified Notre Dame students pursuing a major in the College of Science may also add another major in one of the other undergraduate colleges or schools.

The requirements for a double major between colleges generally are as follows: The student completes all the University requirements, the requirements of his or her college or school, and the requirements of both majors. In general, a single course may not satisfy requirements for both majors.

**Supplementary Majors and Minors.** Qualified Notre Dame students pursuing majors in the College of Science may add a supplementary major or minor. Options include programs offered through the College of Arts and Letters and the Environmental Geosciences minor offered through the College of Engineering.

Science students may not add the Arts and Letters Preprofessional Studies supplementary major.

**Supplementary Majors, Minors, and Concentrations in the College of Science.** In the College of Science, the term "second major" is used for a supplementary major. Three departments offer a 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. For details, see the departmental sections of this *Bulletin*.

Three departments in the College of Science offer concentration programs: Applied and Computational Mathematics and Statistics, Mathematics and Physics. For details, see the departmental sections of this Bulletin.

**Combination Five-Year Program with the Mendoza College of Business.** The College of Science and the Mendoza College of Business have established a competitive cooperative program in which a student may simultaneously earn a bachelor of science and a master of business administration degree. The program is structured so that the student who has completed the three years of a science bachelor's degree program, if accepted, completes the master of business administration and the bachelor of science in a major in the College of Science in a summer session and two subsequent academic years.

Students who wish to pursue this program should have a superior scholastic record in their major program and must make application to, and be accepted by, the MBA program.

The general sequence of courses in the five-year Science-MBA program may be found under "Dual Degree Program with the Mendoza College of Business," later in this section of the *Bulletin*.

## STUDENT AWARDS AND PRIZES

## 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.

All College of Science majors must fulfill University requirements, which include:

WR 13100	3 hours
*Theology	6 hours
*Philosophy	6 hours
*History	3 hours
*Social Science	3 hours
*Fine Arts or Literature	3 hours

\* One of these courses must be a University seminar.

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, 20435 or 30210, 30220).

The appropriate sequence for a student depends on the student's major.

The College of Science requires language proficiency through intermediate level in one of the following languages: Arabic, Chinese, French, German, Greek, Irish, Italian, Japanese, Latin, Portuguese, Russian, and Spanish. "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](http://science.nd.edu) under Academic Information Frequently Asked Questions.)

Students with no previous background in a language should start with a beginning-level course. They take typically either nine credits over a three-semester period, eleven credits over a three-semester sequence, or two semesters of an intensive language sequence (10 credits total). Students with Advanced Placement or SAT II credit may receive up to eight credit hours of language toward their degree. If for some reason more than eight credits appear on the transcript, only eight credits will count toward the required 124 credits. Students who arrive with some background in the language they elect, but without AP or SAT II credit, will be placed by departmental examination but will receive no credit hours.

The College of Science will count a maximum of three credit hours 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

No more than one credit hour total from any of these courses may be counted toward the degree per semester. Additionally, a maximum of six credit hours of upper-level (30000- or 40000-level) ROTC courses can be counted toward the 124-credit-hour requirement. These courses will be counted as free electives.

The College of Science works with the Center for Social Concerns (see page 23 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. Recommended science electives for particular science majors are found on the college's website, [science.nd.edu](http://science.nd.edu). 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., in the Department of Biological Sciences, a science elective must be a non-biology course.

All College of Science courses offered by a major program must be taken at the University of Notre Dame. If a student wants to take a course outside Notre Dame for credit toward the Notre Dame degree, prior approval of the dean's office must be

obtained. This does not apply to the courses taken by a transfer student prior to attending Notre Dame.

**Advising.** All Notre Dame science majors have been assigned an advisor in the department of their major. All advisors are members of the faculty of the College of Science. In some departments, the director of undergraduate studies for the department advises all students. In others, the director of undergraduate studies or the department office may be contacted to find out the name of the student's advisor. A complete list of names of advisors is kept on the science website.

Notre Dame students who have questions concerning the choice of a major or considering a change of major are urged to make appointments with the advisors of the departments involved. Students needing help choosing from similar majors may request an advising appointment with the associate or assistant dean of undergraduate studies of the College of Science, 174 Hurley Hall. Any Notre Dame student who is considering a health profession can receive advising in the Center for Health Sciences Advising in 219 Jordan Hall.

## Student Organizations and Activities

In addition to participation in University-wide student activities, the undergraduate students of the College of Science may participate in activities directly related to science, including the undergraduate departmental science organizations: the Biology Club, the Notre Dame Chapter of Student Affiliates of the American Chemical Society, the Mathematics Club, the Society of Physics Students, the Premed Club (preprofessional), the Prevet Club, the Science-Business Club, and the Notre Dame Chapter of Alpha Epsilon Delta (premedical honorary fraternity).

**Student Council.** The Student Council of the College of Science is composed of representatives of the majors of the College of Science. The student council serves as the official body representing the undergraduate students before the administration of the College of Science.

## Student Awards and Prizes

*The Dean's Award.* Presented to the outstanding graduating senior in the College of Science in recognition of exemplary personal character, leadership, service, and outstanding achievement. Selected by the dean and associate dean.

*The Dean's Research Award.* Presented to the outstanding graduating senior in the College of Science in recognition of exceptional research within and across the traditional boundaries of scholarly disciplines who embraces, facilitates, and fosters an environment of scientific inquiry.

## SPECIAL OPPORTUNITIES

*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.

*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.

*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.

*Merck Index Award.* 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.

*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.

*Outstanding Senior Physics Major.* This award is given to the outstanding senior physics major, who, in the judgment of the departmental faculty, shows the most promise for a distinguished career in physics. Course grades, the opinion of those who have taught the candidates, and any research performance are considered in making the award.

*Paul Chagnon Award.* An award to be given to a senior physics major for demonstrated character and leadership and for service to the University, the physics department, and to his or her fellow physics majors.

*Physics Outstanding Undergraduate Research Award.* A monetary award given for excellence in research to an undergraduate physics major.

*DiNardo Award.* To the outstanding junior preprofessional student.

*Emil T. Hofman Scholarships.* To six outstanding students pursuing premedical studies.

*J.C. Lungren, M.D., Scholarships.* Awarded to three outstanding science preprofessional students.

*The Lawrence H. 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 and the College of Science. A limited number of students with academic intents for each college are identified at the time of admission. Although selection criteria include the promise of outstanding academic performance as demonstrated by standardized test scores and high school performance, the program is looking for more than mere academic ability. It hopes to identify students with a deep intellectual curiosity.

The program offers honors sections to fulfill most of the University and college requirements in the students' freshman and sophomore years. At present, there is the yearlong Honors Seminar (satisfying the writing and literature requirements). Honors Calculus, Honors Philosophy, Honors Theology, Honors Biology, Honors Physics, and an array of Honors Social Science courses. Since these courses are restricted to honors students, they are smaller than non-honors sections and are usually taught in a seminar format. The teachers for honors sections are chosen from the most outstanding teachers in each college. After the first year, each student's academic work will be mainly centered in his or her major field (or fields) of study, but two or more honors electives are also taken during these years. In the fall of the senior year, there is an "Honors Thesis/Research Seminar," which is followed by the "Senior Seminar" in the spring. The fall seminar is intended to be a spur to the students' capstone project, whereas the spring seminar brings the honors students from diverse majors back together for some concluding topical discussions. All honors students will also be expected to complete a special six-hour senior research honors project in their major field of study. In science, this is the culmination of a research project begun earlier, and in arts and letters, it is a two-semester project culminating in a thesis. Those writing senior theses work individually under the direction of a faculty advisor of their choosing in their major field. Funds are available for research projects during summers either at Notre Dame or other universities.

In addition to the more narrowly academic features of the honors program, students will be offered various opportunities for broadening personal, cultural, and spiritual growth. Regular colloquia, informal discussions, and cultural excursions are available.

Further information on the structure and content of the Honors Program may be obtained by contacting Prof. Alex Hahn or Prof. Cornelius Delaney, 323 O'Shaughnessy Hall, Notre Dame, IN 46556, 574-631-5398.

**The Environmental Research Center (UNDERC)**, a University facility, is composed of approximately 7,500 acres located primarily in the Upper Peninsula of Michigan. Research is conducted at UNDERC by undergraduate as well as graduate students on a variety of environmental problems, including the manipulation of ecosystems. Internships are available to support student participation in BIOS 35502, 35503, and 35504 at UNDERC each summer semester.

**International Studies Program.** Students from any of the majors in the College of Science may participate in one of the University of Notre Dame's international study 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 international studies should discuss their plans with their advisor and with the associate dean, 248 Nieuwland Science Hall. Further information can be obtained through the Office of International Studies, 105 Main Building.

## Applied and Computational Mathematics and Statistics

### *Chair:*

Steven Buechler

### *Director of Graduate Studies:*

Mark S. Alber

### *Director of Undergraduate Studies:*

Yongtao Zhang

*Vincent J. Duncan and Annamarie Micus Duncan*

### *Professor of Mathematics:*

Andrew Sommese

*Vincent J. Duncan Family Professor of Applied*

### *Mathematics:*

Mark S. Alber

### *Professors:*

Steven Buechler; Bei Hu

### *Associate Professors:*

Zhiliang Xu; Yongtao Zhang

### *Assistant Professors:*

Alexandra Jilkine; Jiahn Li; Jun Li; Alan

Lindsay; Fang Liu

### *Assistant Professors of the Practice:*

James Delaney; Alan Huebner; Huy Huynh;

Ankita Jain

**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) <sup>1</sup>

Physics (PHYS 10310, 10320) <sup>1</sup>

Calculus I, II (MATH 10550, 10560) <sup>1</sup>

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210)

Applied Linear Algebra (ACMS 20620)

Introduction to Probability (ACMS 30530)

Mathematical Statistics (ACMS 30540) or Statistical Methods and Data Analysis I (ACMS 30600)

Mathematical/Comp Modeling (ACMS 40730)

Numerical Analysis (ACMS 40390)

ACMS electives (6 credits in ACMS courses numbered 30000 and above) <sup>2</sup>

MATH or ACMS elective (3 credits in MATH or ACMS courses numbered 30000 or above) <sup>2,3,4</sup>

Science elective (3 credits)

These requirements total 43 credits in ACMS and MATH and 62 credits in Science.

**Concentration in biological sciences.** The required courses for this concentration are as follows.

Introduction to Chemical Principles (CHEM 10171) <sup>1</sup>

Organic Chemistry (CHEM 10172, 20273, 21273) <sup>1</sup>

Physics (PHYS 10310, 10320) <sup>1</sup>

Biological Sciences I, II (BIOS 10161, 10162 or 20201, 21201, 20202, 21202)

Calculus I, II (MATH 10550, 10560) <sup>1</sup>

Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)

Scientific Computing (ACMS 20210)

## APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

Applied Linear Algebra (ACMS 20620)		<i>Second Semester</i>		<b>Junior Year</b>	
Introduction to Probability (ACMS 30530)		ACMS 30540. Mathematical Statistics	3	<i>First Semester</i>	
Mathematical Statistics (ACMS 30540) or Statistical Methods and Data Analysis I (ACMS 30600)		ACMS/MATH Elective	3	ACMS 30600. Stat. Methods & Data Analysis I	3.5
Mathematical/Comp Modeling (ACMS 40730)		Literature or Fine Arts	3	PHYS 10310. General Physics I	4
Numerical Analysis (ACMS 40390)		Science Elective	3	BIOS 30341 or 30312	3
ACMS electives (6 credits in ACMS courses numbered 30000 and above) <sup>2,5</sup>		Elective	3	Language	3
Genetics (BIOS 20303)			15	Philosophy or Theology	3
Cellular Biology (BIOS 30341) or Ecology (30312)		<b>Senior Year</b>			16.5
Biology Elective (3 credits in BIOS which has BIOS 10162 or BIOS 20202 as a prerequisite)		<i>First Semester</i>		<i>Second Semester</i>	
Elective in Biology, Chemistry or Physics (3 credits)		ACMS 40730. Mathematical/Comp Modeling	3	BIOS 20303. Genetics	3
These requirements total 40 credits in ACMS and MATH and 80 credits in Science.		ACMS Elective	3	PHYS 10320. General Physics II	4
		Elective	9	Biology/Chemistry/Physics Elective	3
			15	Literature or Fine Arts	3
		<i>Second Semester</i>		Elective	3
		ACMS Elective	3		16
		Electives	9	<b>Senior Year</b>	
			12	<i>First Semester</i>	
<b>ACMS Sample Curriculum:</b>				ACMS 40390. Numerical Analysis	3
<b>First Year</b>		<b>ACMS/BIOS Sample Curriculum:</b>		ACMS 40730. Mathematical/Comp Modeling	3
<i>First Semester</i>		<b>First Year</b>		Biology Elective	3
MATH 10550. Calculus I	4	<i>First Semester</i>		ACMS Elective	3
CHEM 10171. Chemical Principles	4	MATH 10550. Calculus I	4	Elective	3
PHYS 10310. General Physics I	4	CHEM 10171. Chemical Principles	4		15
History or Social Science <sup>6</sup>	3	BIOS 10161. Biological Sciences I	4	<i>Second Semester</i>	
WR 13100. Writing and Rhetoric	3	History or Social Science <sup>6</sup>	3	ACMS Elective	3
Physical Education or ROTC	0	WR 13100. Writing and Rhetoric	3	ACMS Elective	3
	18	Physical Education or ROTC	0	Electives	6
<i>Second Semester</i>			18		12
MATH 10560. Calculus II	4	<i>Second Semester</i>		<b>Notes:</b>	
CHEM 10172 or 10122	4	MATH 10560. Calculus II	4	1. Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.	
PHYS 10320. General Physics II	4	CHEM 10172	4	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.	
History or Social Science <sup>6</sup>	3	BIOS 10162. Biological Sciences II	4	3. Introduction to Mathematical Reasoning (MATH 20630) is also an acceptable ACMS/MATH elective.	
Philosophy or Theology <sup>6</sup>	3	History or Social Science <sup>6</sup>	3	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).	
Physical Education or ROTC	0	Philosophy or Theology <sup>6</sup>	3	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.	
	18	Physical Education or ROTC	0	6. 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.	
<b>Sophomore Year</b>			18	7. One of the two of these courses (ACMS 30600, ACMS 30540) is a required course. If both courses are taken, the other course can be counted as an ACMS elective.	
<i>First Semester</i>		<b>Sophomore Year</b>			
ACMS 20550. Applied Math Methods I	3.5	<i>First Semester</i>			
ACMS 20620. Applied Linear Algebra	3	ACMS 20550. Applied Math Methods I	3.5		
Language	3	ACMS 20620. Applied Linear Algebra	3		
Philosophy or Theology	3	CHEM 20273/21273	4		
Elective	3	Language	3		
	15.5	Philosophy or Theology	3		
<i>Second Semester</i>			16.5		
ACMS 20750. Applied Math Methods II	3.5	<i>Second Semester</i>			
ACMS 20210. Scientific Computing	3.5	ACMS 20750. Applied Math Methods II	3.5		
ACMS 30530. Introduction to Probability	3	ACMS 20210. Scientific Computing	3.5		
Language	3	ACMS 30530. Introduction to Probability	3		
Philosophy or Theology	3	Language	3		
	16	Philosophy or Theology	3		
<b>Junior Year</b>			16		
<i>First Semester</i>					
ACMS 30600. Stat. Methods & Data Analysis I <sup>7</sup>	3.5				
ACMS 40390. Numerical Analysis	3				
Language	3				
Philosophy or Theology	3				
Elective	3				
	15.5				

## APPLIED AND COMPUTATIONAL MATHEMATICS AND STATISTICS

**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) <sup>1</sup>	
Physics (PHYS 10310, 10320) <sup>1</sup>	
Calculus I, II (MATH 10550, 10560) <sup>1</sup>	
Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)	
Scientific Computing (ACMS 20210 or approved alternative computing course in science)	
Applied Linear Algebra (ACMS 20620)	
Introduction to Probability (ACMS 30530)	
Mathematical Statistics (ACMS 30540)	
Statistical Methods and Data Analysis I (ACMS 30600)	
ACMS statistics electives (9 credits in ACMS statistics courses chosen from a list of approved courses) <sup>2</sup>	
MATH or ACMS elective (3 credits in MATH or ACMS courses numbered 30000 or above) <sup>3</sup>	
Science elective (3 credits)	
These requirements total 43 credits in ACMS and MATH and 62 credits in Science.	

**Statistics Sample Curriculum:****First Year***First Semester*

MATH 10550. Calculus I	4
CHEM 10171. Chemical Principles	4
PHYS 10310. General Physics I	4
History or Social Science <sup>4</sup>	3
FYC 13100. Composition	3
Physical Education or ROTC	0
	<hr/>
	18

*Second Semester*

MATH 10560. Calculus II	4
CHEM 10172 or 10122	4
PHYS 10320. General Physics II	4
History or Social Science <sup>4</sup>	3
Philosophy or Theology <sup>4</sup>	3
Physical Education or ROTC	0
	<hr/>
	18

**Sophomore Year***First Semester*

ACMS 20550. Applied Math Methods I	3.5
ACMS 20620. Applied Linear Algebra	3
Language	3
Philosophy or Theology	3
Elective	3
	<hr/>
	15.5

*Second Semester*

ACMS 20750. Applied Math Methods II	3.5
ACMS 20210. Scientific Computing	3.5
ACMS 30530 Intro Probability	3
Language	3
Philosophy or Theology	3
Elective	3
	<hr/>
	19

**Junior Year***First Semester*

ACMS 30600. Stat. Mthds Data Anal.	3.5
ACMS 30540. Mathematical Statistics	3
Language	3
Philosophy or Theology	3
Elective	3
	<hr/>
	15.5

*Second Semester*

ACMS Statistics Elective	3
ACMS/MATH Elective	3
Literature or Fine Arts	3
Science Elective	3
Elective	3
	<hr/>
	15

**Senior Year***First Semester*

ACMS Statistics Elective	3
Science Elective	3
Elective	9
	<hr/>
	15

*Second Semester*

ACMS Statistics Elective	3
Electives	9
	<hr/>
	12

**Notes:**

- Equivalent or higher sequences in science may be substituted, e.g., MATH 10850, 10860 for MATH 10550, 10560.*
- The acceptable elective courses are:*
  - ACMS 40842 Time Series Analysis*
  - ACMS 40852 Statistical Methods in the Biological and Health Sciences*
  - ACMS 40860 Statistical Methods in Molecular Biology*
  - ACMS 40870 Statistical Methods in Social Sciences*
  - ACMS 40880 Statistical Methods in Pattern Recognition and Prediction*
  - ACMS 40890 Statistical Methods in Financial Risk Management*
  - Any graduate ACMS course in statistics or probability*
- Introduction to Mathematical Reasoning (MATH 20630) is also an acceptable elective.*
- 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.*

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**SUPPLEMENTARY MAJOR IN STATISTICS**

The supplementary major in statistics requires 37 credits in ACMS and Mathematics. The specific requirements are as follows.

Calculus I, II (MATH 10550, 10560)
Introduction to Applied Mathematics Methods, I, II (ACMS 20550, 20750)
Scientific Computing (ACMS 20210 or approved alternative computing course in science)
Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Mathematical Statistics (ACMS 30540)
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)
Applied Linear Algebra (ACMS 20620)
Introduction to Probability (ACMS 30530)
Mathematical Statistics (ACMS 30540) or Statistical Methods and Data Analysis I (ACMS 30600)
Mathematical/Comp Modeling (ACMS 40730)
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)

## BIOLOGICAL SCIENCES

**HONORS IN ACMS**

Junior majors in ACMS may apply for the departmental honors program to receive the designation "Honors in Applied and Computational Mathematics and Statistics".

Here are the requirements:

- A minimum of Cum GPA of 3.5.
- Complete a minimum of two semesters in undergraduate research ACMS 48498 during the junior or senior year, potentially including a summer semester.
- Complete an undergraduate thesis, ACMS 48500.
- Presentation of the thesis in a seminar or a conference, on campus or outside campus.

Before the end of the junior year, students interested in the Honors option must apply to the director for undergraduate studies, who will make suggestions to students for an appropriate advisor. The subject matter should be in an area of expertise of at least one member of the department. The student will work with the advisor to complete a thesis, which must be signed off by the advisor and then submitted to the Director of Undergraduate Studies by April 15 of the senior year. If approved, the student will receive credit for ACMS 48500, Undergraduate Thesis.

The undergraduate thesis must go beyond what is found in an undergraduate course, and present a novel approach to a subject.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Applied & Computational Mathematics and Statistics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

**Biological Sciences***Chair:*

Gary A. Lamberti

*Assistant Chairs:*

Sunny Boyd; Ronald A. Hellenthal

*Director of Undergraduate Studies:*

David Veselik

*George and Winifred Clark Professor of**Biological Sciences:*

Frank H. Collins

*Galla Professor:*

Jennifer L. Tank

*Claire Boothe Luce Assistant Professor:*

Elizabeth A. Archie

*Coleman Junior Chair:*

Zachary T. Schafer

*Keough-Hesburgh Chair in Electrical Engineering**and Biological Sciences:*

Gregory L. Timp

*Professor and Gillen Director of UNDERC:*

Gary Belovsky

*Julius A. Nieuwland Chair in Biochemistry:*

Katsuri Haldar

*Martin J. Gillen Professor of Biological Sciences:*

John G. Duman

*Walther Cancer Institute Professor:*

Crislyn D'souza-Schorey

*Professor and Rev. Howard J. Kenna, C.S.C. Memorial**Director of the Zebrafish Center:*

David R. Hyde

*University of Notre Dame Chair in Biological Sciences:*

Robert A. Schulz

*Professors:*

Nora J. Besansky; Sunny K. Boyd; Harald E. Esch (emeritus); Jeffrey L. Feder; Malcolm J. Fraser; Morton S. Fuchs (emeritus); Paul R. Grimstad (emeritus); Ronald A. Hellenthal (emeritus); Charles F. Kulpa Jr. (emeritus); Gary A. Lamberti; David M. Lodge; Edwin Michael; Kenneth R. Olson (adjunct); Joseph E. O'Tousa; Jeffrey S. Schorey; David W. Severson; Kristin Shrader-Frechette (concurrent); Jeanne Romero-Severson; Kenyon S. Tweedell (emeritus)

*Associate Professors:*

Michael L. Blakesley (adjunct); Giles Duffield; Michael T. Ferdig; David A. Halperin (adjunct); Jessica Hellmann; Hope Hollocher; Lei Li; Mary Ann McDowell; Jason McLachlan; John F. O'Malley (adjunct); Michael E. Pfrender; Kevin T. Vaughan

*Assistant Professors:*

Suzanne Bohlon (adjunct); Patricia A. Champion; Molly Duman Scheel (adjunct); Reginald Hill; Stuart Jones; Shaun W. Lee; Miguel Morales; Benjamin Ridenhour; Adrian Rocha; Zainulabuddin Syed; Tracy Vargo-Gogola (adjunct); Rebecca Wingert; Siyuan Zhang

**Program of Studies.** The Department of Biological Sciences offers programs of study leading to the degrees of bachelor of science with a major in biological sciences or bachelor of science with a

major in environmental sciences, master of science in biological sciences and doctor of philosophy. Also offered is a second major in environmental sciences for students in the College of Arts and Letters or in the College of Business Administration.

**Program in Biological Sciences.** The biological sciences encompass all aspects of life sciences, including microbial, plant, and animal life. This includes the biochemistry, genetics, development, physiology, evolution, and ecology of all living things. Every educated person must have sound knowledge of the fundamental principles and facts of the biological sciences to understand himself or herself and the world in which he or she lives. In addition biologists, through their research, contribute to the development of theories and methods required for the solution of humanity's problems in the fields of health, agriculture, industry, and the preservation of the environment.

An undergraduate major in biological sciences prepares a student for graduate study (M.S., Ph.D., MD/Ph.D.) leading to a research career, and also 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. College and university teaching requires the Ph.D. degree.

*The goal of the Department of Biological Sciences is to educate its majors first as scientists prepared for the challenges of modern biology and second for any specialty area(s) in which they develop an interest, especially if that interest is directed-- toward graduate school and research. Also, for the approximately 70 percent of biology majors who initially express an interest in going to medical school or other health-related graduate programs, the key topic areas of modern biology emphasized in the core curriculum are also very relevant to their training as "medical biologists."*

*Students majoring in biological sciences are required to follow a core curriculum.* This core not only provides exposure to most areas of modern biology but also includes courses representative of all the levels of biological organization, i.e., from atoms and molecules through ecosystems. Students unsure of which area of biology most appeals to their interests will more easily arrive at that decision through the completion of the core.

**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.*

## BIOLOGICAL SCIENCES

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. With the move into the new Jordan Hall of Science in fall 2006, biology faculty have begun the creation of new laboratory courses that will count toward the major laboratory requirements.

**Biology Survey Courses (10101–10119)** have a prerequisite of one year of high school chemistry and biology and are designed for first-year students needing to satisfy the University science requirements. These courses will address fundamental aspects of modern biology ranging from genetics to wildlife biology. There will generally be as many as six sections of biology courses available each year; any course may have multiple sections. The listed courses and new courses are offered when demand warrants, allowing subject matter to change depending on students' interests and needs and emerging or changing areas of life sciences. These survey courses are generally recommended University electives and are not open to science majors.

*These 101xx-level survey courses 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*.

## BACHELOR OF SCIENCE WITH A MAJOR IN BIOLOGICAL SCIENCES

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 30210–30220)<sup>1</sup>  
Calculus (MATH 10350–10360 or 10550–10560)

The requirements in biological sciences include courses from a basic six core sequence 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 10161–10162)* in their first year** to ensure the completion of all requirements in four years. Students may begin

the core with General Biology A and B (BIOS 20201–20202); however, they will be at a considerable disadvantage in scheduling requirements in the two remaining years; they also will have one year less to explore their interests in biology.

There are seven components to the biology core requirement, consisting of courses in the following areas:

### Core I: Introductory Biology

- Metabolism and Genetics
- Ecology, Diversity, and Physiology

Students choose from either:

- Biological Sciences I and II (BIOS 10161–10162) (includes two labs)<sup>2</sup> or
- General Biology A and B (BIOS 20201–20202) (includes two labs)<sup>2</sup>

These labs are designated Lab #1 and Lab #2 of the six required for the major.

### Core II: Genetics

Students choose from either:

- Classical and Molecular Genetics (BIOS 20250 and 21250; lab #3)<sup>3</sup> or
- Fundamentals of Genetics (BIOS 20303 and 21303; alternate lab #3)

### Core III: Cellular Biology

Students choose from either:

- Molecular Cell Biology (BIOS 20241)<sup>3</sup> or
- Cellular Biology (BIOS 30341)

Optional labs available are BIOS 27241, a research-orientated 2-credit laboratory<sup>3</sup>, or BIOS 31341, a basic 1-credit cell biology laboratory primarily for premed majors. Students may not take both cell labs.

### Core IV: Physiology

Students choose from either:

- Vertebrate (Human) Physiology (BIOS 30344)<sup>4</sup> or
- Integrative Comparative Physiology (BIOS 30421) (not available all years).

Optional lab available is BIOS 41344.

### Core V: Evolutionary Biology

Students choose from either:

- Evolution (BIOS 30305) or The History of Life (BIOS 30310)
- Other courses as designated in the future, prior to the Class of 2016 graduation.

### Core VI: Ecology

Students choose from either:

- General Ecology (BIOS 30312; optional lab BIOS 31312 is offered fall semesters only)
- Aquatic Ecology (BIOS 30420 and required lab BIOS 31420—offered fall only).

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.

## BIOS ELECTIVES

The minimum required credits in the core including labs is 27. An additional 14 credits of electives in biological sciences are chosen to complete the required total of 41 credits.<sup>5–8</sup> All biological sciences majors are encouraged to include non-science among their “free electives.”

### Notes:

1. *Alternatively, students may select the physics sequences PHYS 10310–10320 or PHYS 10411, 20435.*

2. *Students are required to take a total of six laboratories; three of the six labs will be part of the Core (Core I(a,b), II, and the remaining three of the six laboratories are chosen among the core III through Core VI and/or BIOS electives, including 50000- and 60000-level courses. Thus, there are three required “named” BIOS labs and three additional elective BIOS labs. As an option, students who conduct a minimum of three semesters of undergraduate research (BIOS 48498) in the same 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 six required labs.*

3. *Career-oriented majors in biological sciences, as well as those considering a professional school (medicine, veterinary science, others), are urged to select the courses Molecular Cell Biology (BIOS 20241) and Classical and Molecular Genetics (BIOS 20250). These should be taken in the sophomore year but no later than the junior year. The two-credit cell research lab (BIOS 27241) is especially ideal for those interested in obtaining summer research internships, doing undergraduate research at Notre Dame or elsewhere, and is especially critical to any graduate research career. Students enrolled during the summer sessions may take the 2-credit cell biology lab (BIOS 38499) as an alternative. Only one of the three available cell biology labs may count toward the required six, however.*

4. *Physiology should be completed by the end of the junior year for students planning to take the MCAT exam or the seventh semester for students planning to take the GRE biology subjects exam.*

5. *Most graduate (60000-level) courses (through 60579) are open to eligible juniors and seniors; often the majority of students in these advanced courses are undergraduates.*

6. *Students may choose additional courses in the Core areas III through VI or among courses not assigned to the core (e.g., BIOS 40411, Biostatistics, or BIOS 48498, Undergraduate Research), or 60000-level courses as BIOS electives, to meet the required total of 41 credit hours in biological science courses.*

7. *Select non-BIOS major-level College of Science courses (i.e., those taken to meet science-major*



## BIOLOGICAL SCIENCES

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.

8. 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.

## RECOMMENDED COURSE GROUPINGS

After consultation with the director of undergraduate studies or other faculty advisors including research mentors, each student is encouraged to select the curriculum which best fits his or her career goals. A great deal of flexibility is permitted in designing each individual's projected course schedule, within the context of the core curriculum. *In essence, each student will be able to design his or her unique biology curriculum in the context of the core requirements and additional biology electives to reflect individual career intent or life science interests.* For students wishing to emphasize specific areas of biology in their curricula, the following four course groupings are *provided as guides* that have proved to be appropriate for most of our previous graduates. Students may wish to consider these and others that are available as the equivalent of a “concentration in a specific area of biology or simply view these as examples of how a particular interest or career goal can be supported by a structure set of courses.

**General Biosciences:** This grouping gives the student a broad foundation in biological sciences

by requiring electives from each of its major areas. This grouping may be designed as preparation for the Graduate Record Examination (GRE) in biology, or the Medical College Admission Test (MCAT). Students considering graduate school or secondary science education, or those without a clear career goal, should consider these courses.

Here, students follow the core curriculum, making choices in Cores III through VI. For MCAT preparation, it is essential for students to complete one semester of genetics (BIOS 20250 or BIOS 20303), one semester of cell biology (BIOS 20241 or BIOS 30341), and one semester of physiology (BIOS 30344 or BIOS 30421) prior to taking that exam. Majors are strongly encouraged to take additional biology courses such as developmental biology (BIOS 30342) as additional MCAT coursework preparation.

Also recommended for electives in biological sciences is a course in either vertebrate or invertebrate biology (e.g., BIOS 30404, Vertebrate Biology, or BIOS 30406, General Entomology). Dependent on the credits associated with the choice of courses made in the core, students will be required to pick three to five more electives in biological sciences to complete the requirement of 41 credits.

**Premedicine/Pre-Health:** In addition to the core requirements in genetics, cell biology, and physiology, biology premed/pre-health majors are advised to include developmental biology (BIOS 30342), one or more courses in infectious diseases or disease mechanisms, biostatistics, and additional relevant electives (neurobiology, tumor cell biology, etc.), and biochemistry (CHEM 40420) as BIOS electives to reach the required 41 credits in biology.

Majors intending to go on for an MD/Ph.D. should include multiple semesters of undergraduate research and/or summer research internships in their overall program.

**Cellular and Subcellular:** This grouping was designed for students considering graduate study in any of the many areas of cellular biology and biochemistry. It is also appropriate for premedical students.

For this grouping, students follow the core curriculum, making choices in Cores III through VI. In the area of Core IV, Physiology, students should consider taking both courses listed. The courses Introduction to Microbiology (BIOS 30401) and Virology (BIOS 40416) are recommended. For electives in biological sciences, a course in Immunology (BIOS 40419), Genomics (BIOS 30423), or Advanced Cell Biology (BIOS 60539) is recommended. Dependent on the credits associated with the choice of courses made in the core, students will generally be required to pick two more electives in biological sciences to complete the requirement of 41 credits.

**Organismal and Community:** This grouping is primarily intended for students planning careers in ecology, environmental biology and related areas and

allows students to develop considerable expertise during their undergraduate years. It may include electives in biological sciences beyond the 41 credits required of the major. Individual interests may be accommodated by judicious choice of biological science courses and of the science elective.

Students interested in this area of biological sciences may wish to take advantage of the University of Notre Dame Environmental Research Center (UNDERC), a University facility which comprises about 7,000 acres, including more than 20 lakes, in the Upper Peninsula of Michigan. Biological research (including whole-ecosystem experiments), graduate studies and undergraduate course work take place at the center. Paid internships are available to support student participation in BIOS 35502 at UNDERC each summer. Students who participate in UNDERC (EAST) (BIOS 35502) are also then eligible to participate in UNDERC WEST (BIOS 35503) and/or UNDERC (SOUTH) (BIOS 35504 or 35505). However, only a maximum of 7.0 “UNDERC” credits may count towards the required 41.0 BIOS credits for this major. Credits beyond 7 are considered as general elective credits for the purpose of graduation.

In this grouping, students follow the core curriculum, making choices in Cores III through VI. In the area of Core VI, Ecology, students should consider taking both courses listed. Students are encouraged to take Plant Science (BIOS 30325). Also recommended are Vertebrate Biology (BIOS 30404) and/or Animal Behavior (BIOS 30407).

**Microbiology and Infectious Disease:** This grouping is intended for students interested in microorganisms and molecular biology and who are considering graduate study in these areas. It is also appropriate for premedical students. It requires electives in biological sciences beyond the 41 credits required of the major.

Here, students follow the core curriculum, making choices in Cores III through VI. Students should take Principles of Microbiology (BIOS 30401 and the lab BIOS 31401); Virology (BIOS 40416); or Medical and Veterinary Parasitology (BIOS 40415); Immunology (BIOS 40419); Cellular and Molecular Basis of Human Disease (BIOS 40435); and/or AIDS (BIOS 40440).

**Neurobiology/Neuroscience.** It is expected that during the 2013-2014 or 2014-2015 academic year(s) a formal neurobiology/neuroscience core curriculum will be created within the Department of Biological Sciences. This program will involve the Department of Psychology.

**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.

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**Note that this *sample curriculum* assumes that no AP or language CE credits are included.**

**First Year***Fall Semester*

BIOS 10161 (Core Ia: Principles) (Lab #1)	4
MATH 10350 or 10550	4
CHEM 10171 (or 10181) <sup>1</sup>	4
History or Sociology <sup>2</sup>	3
WR 13100	3
Physical Education or ROTC	0
	18

*Spring Semester*

BIOS 10162 (Core Ib: Principles) (Lab #2)	4
MATH 10360 or 10560	4
CHEM 10172 (or 10182) <sup>1</sup>	4
History or Sociology <sup>2</sup>	3
Theology or Philosophy <sup>2</sup>	3
Physical Education or ROTC	0
	18

**Sophomore Year***Fall Semester*

BIOS 20250 (Core II: Genetics)	4
BIOS 21250 (required LAB #3)	1
CHEM 20273	4
Theology/Philosophy	3
Language	4
	16

*Spring Semester*

BIOS 20241 (Core III: Cell Biology)	3
Elective Lab 4 (e.g., 27241 Cell Biology)	2
CHEM 20274	4
Theology/Philosophy	3
Language	4
	16

**Junior Year***Fall Semester (V overseas BIOS class(es) are an option)*

BIOS Core V (Evolutionary Biology)	3
Physics 30210, 31210	4
Free Elective	3
Theology/Philosophy	3
Language	3
Elective BIOS Lab #4	1
	17

*Spring Semester*

BIOS 40411 (Biostatistics)	4
BIOS Core IV (Physiology)	3
Physics 30220, 31220	4
Fine Art/Literature <sup>3</sup>	3
	14

**Senior Year***Fall Semester*

BIOS Core VI (Ecology)	3
BIOS or Science Elective <sup>4</sup>	3
Free Elective	3
Free Elective	3
Elective BIOS Lab #5	1
	13

*Spring Semester*

BIOS Elective	3
BIOS Elective	3
Free Elective	3
Free Elective	3
Elective BIOS Lab #6	-/1
	12/13

TOTAL: 124 minimum

*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 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.*

*4 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.*

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*.

**UNDERC FIELD BIOLOGY PROGRAMS**

Seven-credit programs for undergraduates that emphasize field biology are offered at the University's Environmental Research Centers (Michigan and Montana). The programs entail course work, group research projects, and an independent research project. Application to the programs occurs in the fall of the sophomore and junior years and enrollment is limited by housing at each location. If selected, students enroll in BIOS 35501 during the spring semester and BIOS 35502 during the summer. To participate in the Montana (BIOS 35503) or other programs (BIOS 35504, 35505), one must first participate in the Michigan program.

**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.

These include:

60508. Population Genetics  
60515. Vector Genetics  
60523. Practicum in Environmental Biology  
60527. Stream Ecology  
60529. Population and Disease Ecology  
60530. Immunobiology of Infectious Diseases  
60531. Molecular Biology I  
60532. Molecular Biology II  
60558. Biological Electron Microscopy  
60562. Aquatic Insects  
60570–60579. Topics Courses

Additional undergraduate and graduate-level courses are expected to be added during the next four years.

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 [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting one or more of the following subjects:

- *Biological Sciences*
- *Global Health - Eck Institute*
- *Sustainability*

Course descriptions can be found by clicking on the subject code and course number in the search results.

**MINOR IN SUSTAINABILITY***Director:*

Maria Pia Miglietta

*Advisory Committee:*

Samantha Salden (Chair)

Matthew Ashley

Thomas Frecka

Jessica Hellmann

Richard Jensen

Maria Pia Miglietta

Rachel Novick

Anthony Serianni

John Sitter

Edwardo Wolf

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

## BIOLOGICAL SCIENCES

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 also will 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 freshman, sophomore, or junior years.

Students are required to take a gateway course “Principles of Sustainability”, an interdisciplinary course taught every semester by at least three faculty from multiple departments across the university. This course should be taken at the beginning of study in the minor.

Students then select from a controlled list of approved courses totaling at least 3 classes of at least 9 credits. Students must take two courses outside of their College and all distribution courses outside of their major. They also must take courses from at least two of three sustainability categories. One-credit seminars such as those offered by the Center for Social Concerns can be accumulated to give the equivalent of one 3-credit course. One of the qualifying courses can be a University Seminar or College Seminar in Arts and Letters if it occurs in the approved course list.

At the conclusion of the gateway course, students will submit a plan for their capstone experience to the course faculty for approval. The capstone experience can be composed of research, community or service learning, or a campus project. It can be pursued individually or in interdisciplinary groups. An update to the capstone plan must be submitted to the Director of the minor at the beginning of their penultimate year of study. That plan should include proposed advisor(s), community or campus collaborator(s), and, if appropriate, source of funding. Proposals and updated plans should address a sustainability issue or problem in a scholarly fashion and be consistent with the learning objectives of the minor. Students must enroll in at least two (2) credits of independent study to pursue their capstone project and one (1) credit of capstone seminar where students will present their work in an interdisciplinary setting and submit a paper that describes and critically assesses their capstone experience. Capstone experiences for the sustainability minor can be combined with another thesis project if approved by the minor Director. The Director will consult the advisor committee in approving capstone plans.

Additional details about the Minor in Sustainability can be found online at <http://science.nd.edu/undergraduate/minors/sustainability/>.

SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ANY BIOLOGICAL SCIENCES MAJOR		
		<i>Year Usual Credits Taken</i>
<b>Biological Sciences*</b>	<b>41</b>	<b>all</b>
<b>Chemistry (10171–10172 or 10181–10182)</b>	<b>8</b>	<b>First year</b>
	<b>8</b>	<b>Sophomore</b>
<b>Physics (30210–30220 with labs)</b>	<b>8</b>	<b>Junior</b>
<b>Mathematics (10350–10360 or 10550–10560)</b>	<b>8</b>	<b>First year</b>
<b>Total Science:</b>	<b>73</b>	
<b>History**</b>	<b>3</b>	<b>First year</b>
<b>Social Science**</b>	<b>3</b>	<b>First year</b>
<b>Philosophy**</b>	<b>6</b>	<b>Sophomore/Junior</b>
<b>Theology**</b>	<b>6</b>	<b>Sophomore/Junior</b>
<b>WR 13100</b>	<b>3</b>	<b>First year</b>
<b>Language</b>	<b>Intermediate Level Competency (3)</b>	<b>Sophomore/Junior</b>
<b>Literature/Fine Arts**</b>	<b>3</b>	<b>Junior/Senior</b>
<b>Free Electives</b>	<b>24+</b>	<b>Sophomore/Senior</b>
<b>Physical Education or ROTC (2 semesters)</b>	<b>0</b>	<b>First year</b>
	<b>124 credits</b>	
* 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 with AP course credits and/or language Credit by Exam (CE) often have time to incorporate 20 or more free elective credits (i.e., a second major or minor) into their four-year course selection.		

### BIOLOGICAL SCIENCES HONORS PROGRAM

The goal of the biology honors program is to give our most talented students an exceptional background in biological research. Participation in this program will increase their level of commitment and productivity while preparing them for successful postgraduate work.

The program will accept junior biological sciences and environmental science majors in good academic standing who have already completed one semester of undergraduate research at Notre Dame. Selection by the Undergraduate Research Committee will be based on a research statement, transcript, a minimum GPA of 3.25 in College of Science courses, and a recommendation letter from their research advisor.

To graduate with honors, students will have to complete:

1. At least three semesters (for at least 4 credits total) and one summer of independent research at

Notre Dame. Students are expected to apply for REU, COS-SURF or other summer funding as appropriate.

2. A thesis of at least 20 pages (a manuscript can substitute only if the student has made substantial writing contributions to the work).
3. A graduate-level course in the area of course in the area of research.
4. A presentation at a national or regional meeting or manuscript submitted to a peer-reviewed journal.
5. One disciplinary research seminar each year (1 credit seminar, see below).

#### Thesis Requirements:

Students will write a draft of their thesis in the senior research seminar with input from the advisor and the seminar coordinator. The final draft of the thesis will be written with the advisor, and will be submitted by April 1. 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.

Guidelines for the thesis and thesis reviewers will be provided.

#### Disciplinary Research Seminar (Graded S/U)

The purpose of these disciplinary groups is to create a small learning community where students and practicing scientists can connect. 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. As appropriate, the groups will meet as a whole to foster interdisciplinary habits of mind and skills. The seminar will have the added benefit of helping students prepare for graduate applications and fellowships.

#### Ecology and Evolution seminar coordinator:

Dom Chaloner, Mark Olsen, or Ken Filchak with T&R guest speakers

#### Cell/Molecular seminar coordinator:

Michelle Whaley or David Veselik with T&R guest speakers

#### Infectious Disease/Genomics/Bioinformatics seminar coordinator:

Jen Robichaud with T&R guest speakers

#### Possible junior year topics (offered each spring):

1. Critical reading of research articles
2. Project/experimental design, creativity in research. T&R faculty will share their research agenda, but also why they chose their research questions and approaches.
3. Research presentations (posters and talks)
4. Research ethics
5. Career exploration that includes guest speakers—seminar speakers, alumni speakers.

#### Possible senior year topics (offered each fall):

1. Thesis preparation
2. The publication process
3. Graduate fellowship and graduate school personal statements
4. Attend biology seminars and discuss research methods and results with faculty
5. Journal club (with grad students if possible).

## Chemistry and Biochemistry

#### Chair:

Kenneth W. Henderson

*George and Winifred Clark Professor of Chemistry:*

Marvin J. Miller

*Grace-Rupley Professor of Chemistry*

Norman Dovichi

*Emil T. Hofman Professor of Chemistry*

Bradley D. Smith

*Charles L. Huisking Professor of Chemistry:*

Xavier Creary

*Kleiderer/Pezold Professor of Biochemistry*

Francis J. Castellino

*Navari Family Professor of Life Sciences:*

Shahriar Mobashery

*Rev. John Cardinal O'Hara Professor*

Patricia L. Clark

*Arthur J. Schmitt Professor of Chemical and*

*Biomolecular Engineering:*

Paul Bohn

*Rev. John A. Zahn Professor of Science:*

Prashant V. Kamat

#### Professors:

Brian M. Baker; Seth Brown; Ian Carmichael; Gregory V. Hartland; Paul Helquist; Kenneth W. Henderson; Paul W. Huber; A. Graham Lappin; Joseph P. Marino; Anthony Serianni; Slavi Sevov; Sharon Stack; Richard E. Taylor; Olaf G. Wiest

#### Associate Professors:

Steven A. Corcelli; J. Daniel Gezelter; Holly V. Goodson; S. Alexander Kandel; Masaru Kenneth Kuno; Marya Lieberman; Jeffrey W. Peng

#### Assistant Professors

Brandon L. Ashfeld; Amanda B. Hummon; Haifeng Gao; Vlad M. Iluc; Laurie E. Littlepage; John Parkhill; Zachary D. Schultz; Franklin Tao

#### Emeriti:

Subhash C. Basu; Roger K. Bretthauer; Thomas P. Fehlner; Richard W. Fessenden; Jeremiah P. Freeman; Emil T. Hofman; Dan Meisel; Thomas L. Nowak; W. Robert Scheidt; Robert H. Schuler; J. Kerry Thomas; 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. At the graduate level, the Department of Chemistry and Biochemistry offers programs leading to the degrees of master of science and doctor of philosophy, as described in the *Graduate School Bulletin of Information*.

### BACHELOR OF SCIENCE WITH A MAJOR IN CHEMISTRY

The chemistry curriculum at Notre Dame includes two programs: the Chemistry Career Program, designed for students interested in a professional career in chemistry, and the Chemistry Combination Program, designed for those students who are interested in combining chemistry with business or with computing.

All chemistry majors take the following basic sequence of courses:

General Chemistry (CHEM 10181, 11181 recommended; or optionally, CHEM 10171, 11171)

Organic Chemistry (CHEM 10182, 11182, 20283, 21283)<sup>1</sup>

Inorganic Chemistry (CHEM 20284, 21284, 40443, 41443)

Physical Chemistry (CHEM 30321, 30322, 31322)

Analytical Chemistry (CHEM 30333, 31333)

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, 10320)<sup>1</sup>

Mathematics (MATH 10550, 10560, and CHEM 20262)

In addition to this basic sequence, the following courses are required for each program.

#### Chemistry Career Program

Science Electives (six credit hours)<sup>2</sup>

#### Combination Program

Program Electives (15 credit hours)

Science Electives (three credit hours)<sup>2</sup>

The program electives for the Chemistry Combination Program are from either the area of business or from the area of computing and are

## CHEMISTRY AND BIOCHEMISTRY

the same as those in the corresponding Collegiate Sequence programs:

**Chemistry with Business**

Accounting and Accountancy I (ACCT 20100)  
Accounting and Accountancy II (ACCT 20200)  
Business Finance (FIN 20100)  
Introduction to Management (MGT 20200)  
Introduction to Marketing (MARK 20100)  
Introduction to Economics (ECON 10010 or 12101) is suggested, as a non-program elective, as a prerequisite to MARK 20100 and meets the University social science requirement.

**Chemistry with Computing**

Each student selects 15 credit hours of computer science and engineering and chemistry courses in consultation with a departmental advisor. Program electives require careful scheduling.

**Sample Curriculum (Career Program):****First Year***First Semester*

CHEM 10181	4
CHEM 11181	0
MATH 10550	4
PHYS 10310	4
WR 13100	3
History <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	18

*Second Semester*

CHEM 10182	4
CHEM 11182	0
MATH 10560	4
PHYS 10320	4
Philosophy <sup>3,4</sup>	3
Social Science <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	18

**Sophomore Year***First Semester*

CHEM 20283	3
CHEM 21283	1
CHEM 23201 <sup>5</sup>	1
Language	3
Theology	3
Elective	3
	<hr/>
	14

*Second Semester*

CHEM 20284	3
CHEM 21284	1
CHEM 20262	3
Language	3
Elective	3
	<hr/>
	13

**Junior Year***First Semester*

CHEM 30321	3
CHEM 30333	3
CHEM 31333	1
CHEM 23203 <sup>5</sup>	1
Elective (or Language)	3
Theology	3
	<hr/>
	14

*Second Semester*

CHEM 30322	3
CHEM 31322	2
CHEM 40434 or CHEM 40436	3
Philosophy	3
Elective	3
	<hr/>
	14

**Senior Year***First Semester*

CHEM 40420	3
CHEM 40443	3
CHEM 41443	2
Electives	3
Fine Arts or Literature	3
	<hr/>
	14

*Second Semester*

CHEM 23202 <sup>5</sup>	1
Science Electives <sup>2</sup>	6
Electives	6
	<hr/>
	13

**Sample Curriculum (Combination Program):****First Year***First Semester*

CHEM 10181	4
CHEM 11181	0
MATH 10550	4
PHYS 10310	4
WR 13100	3
History <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	18

*Second Semester*

CHEM 10182	4
CHEM 11182	0
MATH 10560	4
PHYS 10320	4
Philosophy <sup>3,4</sup>	3
Social Science <sup>3</sup>	3
Physical Education/ROTC	0
	<hr/>
	18

**Sophomore Year***First Semester*

CHEM 20283	3
CHEM 21283	1
CHEM 23201 <sup>5</sup>	1
Language	3
Theology	3
Elective	3
	<hr/>
	14

*Second Semester*

CHEM 20284	3
CHEM 21284	1
CHEM 20262	3
Language	3
Elective	3
	<hr/>
	13

**Junior Year***First Semester*

CHEM 30321	3
CHEM 30333	3
CHEM 31333	1
Elective (or Language)	3
Program Elective	3
	<hr/>
	13

*Second Semester*

CHEM 23202 <sup>5</sup>	1
CHEM 30322	3
CHEM 31322	2
CHEM 40434	3
Theology	3
Program Elective	3
	<hr/>
	15

**Senior Year***First Semester*

CHEM 40420	3
CHEM 40443	3
Program Electives	6
CHEM 41443	2
	<hr/>
	14

*Second Semester*

CHEM 23202 <sup>5</sup>	1
Science Elective <sup>2</sup>	3
Program Elective	3
Fine Arts or Literature	3
Philosophy	3
	<hr/>
	15

**Notes:**

1. Substitution with permission only.
2. Undergraduate research, CHEM 48498, is a recommended science elective in all programs beginning in the sophomore year, with typically one or two credits per semester.
3. The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. Economics is required for the Chemistry with Business program.

## CHEMISTRY AND BIOCHEMISTRY

4. One course in theology and philosophy should be completed by the end of the sophomore year. These courses may be taken in either semester of the first or second year.

5. In all the programs, one chemistry seminar is generally taken in each of the sophomore, junior and senior years.

### 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 AND 11181 recommended; or optionally CHEM 10171, 11171)

Organic Chemistry (CHEM 10182, 11182, 20283, 21283)<sup>1</sup>

Inorganic Chemistry (CHEM 20284, 21284)

Physical Chemistry (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)

Physics (PHYS 30210-30220 or PHYS 10310, 10320)

General Biology (BIOS 10161-10162 or 20201, 21201, 20202, 21202)

Genetics (BIOS 20303, 21303)

Cell Biology (BIOS 30341, 31341)

Molecular Biology (BIOS/CHEM 50531)

#### Sample Curriculum (Biochemistry Program):

##### First Year

###### First Semester

CHEM 10181	4
CHEM 11181	0
MATH 10550	4
BIOS 10161	3
BIOS 11161	1
WR 13100	3
History <sup>2</sup>	3
Physical Education/ROTC	0
	18

###### Second Semester

CHEM 10182	4
CHEM 11182	0
MATH 10560	4
BIOS 10162	3
BIOS 11162	1
Philosophy <sup>2,3</sup>	3
Social Science <sup>2</sup>	3
Physical Education/ROTC	0
	18

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	32
Biochemistry	3	3	8
Biological Sciences	—	—	19
Mathematics	8	8	8
Physics	8	8	8
Science Electives	6	3	0
Total Required Science	67	64	75
Program Electives	—	15	—
Total	67	79	75
Language Intermediate-Level Competency			
WR 13100	3	3	3
Philosophy+	6	6	6
Theology+	6	6	6
Literature/Fine Arts+	3	3	3
History+	3	3	3
Social Sciences+	3	3	3
Free Electives	22**	10**	14**
	<b>124</b>	<b>124</b>	<b>124</b>
+ 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.			

#### Sophomore Year

##### First Semester

CHEM 20283	3
CHEM 21283	1
CHEM 23212	0
CHEM 23201 <sup>5</sup>	1
PHYS 30210	4
Language	3
Theology	3
	16

##### Second Semester

CHEM 20284	3
CHEM 21284	1
PHYS 30220	4
CHEM 20262	3
Language	3
	14

#### Junior Year

##### First Semester

CHEM 30321	3
CHEM 30341	3
CHEM 31341	2
CHEM 23203 <sup>5</sup>	1
BIOS 30341, BIOS 31341	4
Elective (or Language) <sup>4</sup>	3
	16

##### Second Semester

CHEM 30322	3
CHEM 30342	3
BIOS 20303, BIOS 21303	4
Philosophy	3
Elective	3
	16

#### Senior Year

##### First Semester

CHEM 30333	2
CHEM 31333	2
BIOS/CHEM 50531	3
Theology	3
Elective	3
	13

## ENVIRONMENTAL SCIENCES

Second Semester	
CHEM 23202 <sup>5</sup>	1
Fine Arts or Literature	3
Electives	8
	<hr/>
	12

**Notes:**

1. *Substitution with permission only.*
2. *The student should take three general requirement courses during the first year, including one course that is designated a University Seminar. Economics is required for the Chemistry with Business program.*
3. *One course in theology and philosophy should be completed by the end of the sophomore year. These courses may be taken in either semester of the first or second year.*
4. *Undergraduate research, CHEM 48498, is a recommended science elective in all programs beginning in the sophomore year with typically one or two credits per semester.*
5. *In all the programs, one chemistry seminar is generally taken in each of the sophomore, junior and senior years.*

**Honors in Chemistry and Biochemistry**

Junior majors in chemistry and biochemistry may apply for the departmental honors program to receive the designation “honors in chemistry” or “honors in biochemistry” in their student transcript if they have a minimum grade point average of 3.5 and are enrolled in undergraduate research CHEM 48498 or CHEM 48499. The requirements for completion of the honors program are a minimum of two semesters of undergraduate research after the beginning of the junior year and the course CHEM 48500, research thesis, with a grade of B or better.

**COURSE DESCRIPTIONS**

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

Graduate courses in chemistry are open to qualified advanced undergraduate students, subject to the approval of the departmental advisor. These courses are listed in the *Graduate School Bulletin of Information*.

**Environmental Sciences***Director:*

Kenneth Filchak

**Program in Environmental Sciences.** The form and function of planet Earth have been changed as a result of the activities of humans. Current concerns, such as environmental pollution and global warming, are the results of complex processes. It is now important for people in all walks of life to be aware of how we interact with the Earth and how environmental changes will affect us in the future.

The environmental sciences major is an interdisciplinary program designed to build sensitivity and breadth in environmental areas. The curriculum is designed to expose students to a scientific view of our environment from biological, chemical and geological 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.

**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. A second major in Environmental Science is also offered to students in the College of Arts and Letters or in the Mendoza College of Business.

**The Second Major for Arts and Letters and Business:** Most students in the College of Arts and Letters or in the Mendoza College of Business may participate in the Environmental Sciences Program as a second major. Second majors are required to complete a minimum of 37 credits of science. Students considering this program should investigate options brought to a first major by adding course work in environmental sciences. For example, students majoring in government and in environmental sciences could consider postgraduate study or careers in *public policy*. Students majoring in economics and in environmental sciences would have a good background for the developing field of *environmental economics*. A second major in Environmental Sciences also complements majors in the other sociological fields of anthropology, psychology, or sociology. Similarly, business students will likely find environmental sciences to be useful background when working with local or federal governments on issues of *environmental compliance* or when considering the impact of business decisions

on the environment (*environmental assessment*). All students are urged to discuss their long-range career plans with advisors in both majors.

**Relationship with Other Programs:** The Environmental Sciences Major Program has a special collaborative relationship with the Science, Technology, and Values (STV) Concentration program housed in the Reilly Center in O’Shaughnessy Hall. Select courses required of environmental sciences first majors are also cross-listed as STV courses. Thus, students in the STV program from across the university are expected to benefit in the curricular endeavors of the Environmental Sciences Program. Environmental sciences first majors often enroll in the STV program. (Environmental science students with flexibility in their program often have room to complete an STV concentration by taking STV courses beyond those required by the first major or university requirements.) However, arts and letters students with second majors in environmental science will be encouraged to participate in further interdisciplinary course work through the STV concentration. Second majors are especially encouraged to take the capstone course, SC 40491, Current Topics in Environmental Science, *provided* it completes that second program.

**Related Options:** A similar bachelor’s degree program, Environmental Geosciences (ENVG), is offered by the College of Engineering.

Also available through the College of Engineering is the Environmental Geosciences minor. Note, for students in ES (or SCBU, SCCO, and SCED): the College of Science will allow the course SC/ENVG 20110 to count toward both the science major and this major. Any courses taken for completion of this minor may not also be counted as science electives or science requirements for a science major.

**BACHELOR OF SCIENCE WITH A MAJOR IN ENVIRONMENTAL SCIENCES**

All environmental sciences first majors take the following courses in science:

Introductory Biology (BIOS 10161–10162 and 11161–11162) or (20201–20202 and 21201–21202)

Chemistry (CHEM 10171 and 10172)

Calculus (MATH 10350–10360) or (10550–10560)<sup>1, 2, 3</sup>

Physical Geology (SC 20110/21110)

Physics (PHYS 10310–10320 or 30210–30220)

Biostatistics (BIOS 40411)<sup>4</sup>

Ecology (BIOS 30312 and 31312)<sup>5</sup>

Chemistry Elective<sup>6</sup>

Current Topics in Environmental Science (SC 40491)

Students also will choose science electives chosen from an approved list,<sup>7</sup> completing a required minimum total of 69 credits in science.

Also required for the major are the following non-science courses:

## ENVIRONMENTAL SCIENCES

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.<sup>8</sup>

Introduction to Microeconomics (ECON 10010 or 20010)<sup>9,10</sup>

Students are also urged to choose their electives from a recommended list of arts and letters courses.<sup>11</sup>

Requirements for the program are summarized in the table in this section.

**Notes:**

1. Equivalent or higher-level sequences in mathematics may be substituted, e.g., MATH 10850–10860 for MATH 10350–10360.

2. Students interested in the area of ecological modeling are strongly urged to take MATH 10550–10560 for their mathematics requirement. Other mathematics courses should be taken as science electives.

3. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350–10360 or MATH 10550–10560. Students having taken MATH 10250, 10110 (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit found later in this section of the Bulletin.)

4. Students transferring into the ES or ES2 major, or transfer students who have previously taken a statistics course equivalent to ACMS 20340, are not required to take BIOS 40411 (Biostatistics). 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. While General Ecology (BIOS 30312 and BIOS 31312) is normally required for ES and ES2 majors, students may substitute an alternative ecology lecture and laboratory course (e.g., BIOS 30420 Aquatic Ecology) when their career interests indicate the alternative is a more appropriate introductory ecology course as determined by the director of their major and approved by the associate dean of the College of Science. An ecology course taken overseas in one of the OIS programs will only rarely substitute for the ND course. Permission to substitute must come from the director of the Environmental Science major and the associate dean, College of Science, prior to taking the class.

6. 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 with the understanding that if/when a laboratory is

established for that course, they will be required to take that lab prior to graduation.

7. The following are examples of many approved science electives for this program:

Botany (BIOS 30304) or at St. Mary's

Evolution (BIOS 30305)

The History of Life (BIOS 30310)

Genetics (BIOS 20250 or 20303)

Principles of Microbiology (BIOS 30401)

Animal Behavior (BIOS 30407)

Aquatic Ecology (BIOS 30420)

Stream Ecology (BIOS 60527)

Numerous other BIOS courses as designated by the ES director, including 60000-level graduate courses are accepted.

Environmental Chemistry (CHEM 20204)

Further chemistry electives (from Note 6 above)

Second course in general chemistry (CHEM 20274)

Principles of Biochemistry (CHEM 40420)

Computer Programming and Problem Solving (MATH 20210)

Calculus III (MATH 20550)

Introduction to Linear Algebra and Differential Equations (MATH 20580)

Differential Equations (MATH 30650)

Topics in Computing

Historical Geology (SC 20120)

Mineralogy and Optical Mineralogy (SC 20220)

Environmental Geology (SC 30111)

Sedimentation and Stratigraphy (SC 30230)

Geochemistry

Paleontology (SC 40350)

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 International Studies Programs (UC-Dublin, UWA-Perth) also may be counted toward the ES science electives as well as select ENVG 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.

8. For this major, the University requirement of a second philosophy or theology or other University-required course may be fulfilled by one of these courses.

9. 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.

10. For this major, the University social science requirement will be fulfilled by the required microeconomics course.

11. 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.

**Sample Curriculum (B.S. Degree Majors):****First Year***First Semester\**

Biological Sciences I and lab	4
Calculus A	4
General Chemistry I and lab	4
WR 13100 or History**	3
Theology I** or Philosophy I**	3
Physical Education I or ROTC I	—
	18

*Second Semester*

Biological Sciences II and lab	4
Calculus B	4
Organic Chemistry I and lab	4
WR 13100 or History**	3
Theology I** or Philosophy I**	3
Physical Education II or ROTC II	—
	18

**Sophomore Year***First Semester*

Physical Geology and lab	4
Ecology and lab	4
Language I	4
Microeconomics	3
	15

*Second Semester*

Chemistry II and lab	4
Biostatistics	4
Language II	4
General Elective <sup>1</sup>	3
	15

**Junior Year***First Semester*

Physics I and lab	4
Theology II <sup>8</sup> or Philosophy II <sup>8</sup>	3
Language III (intermediate level)	3
Science Elective #1	3
Science Elective #2	3
	16

*Second Semester*

Physics II and lab	4
Science Elective #3	3
Theology II <sup>8</sup> or Philosophy II <sup>8</sup>	3
General Elective <sup>11</sup>	3
Conservation Seminar	1
	14



## ENVIRONMENTAL SCIENCES

**Senior Year***First Semester*

Current Topics (SC 40491)	3
Science Elective #4	3
Science Elective #5	3
Fine Art/Literature	3
General Elective <sup>11</sup>	3

15

*Second Semester*

Science Elective #6	3
General Elective <sup>11</sup>	3
General Elective <sup>11</sup>	3
General Elective <sup>11</sup>	3
General Elective <sup>11</sup>	1

13

**\*Ideally, students who decide to major in environmental sciences before beginning their first year should take BIOS 10161–10162.** This will allow for an additional year of relevant science and other electives to be included in their total curriculum. See notes accompanying BIOS 10161–10162 and BIOS 20201–20202 for additional information.

**\*\* One of these must be a University Seminar (13180–18189).**

**ENVIRONMENTAL SCIENCES AS A SECOND MAJOR**

Most students in the College of Arts and Letters or in the Mendoza College of Business may participate in the Environmental Sciences Program as second majors. Students who are considering the environmental sciences second major must have a first major in one of the departments of the College of Arts and Letters or the Mendoza College of Business. Because of the sizable overlap in requirements, students in the College of Arts and Letters who have a second major in preprofessional studies will not be allowed to add this second major program.

The requirements for second majors consist of the following science courses:<sup>12</sup>

General Biology (BIOS 10161+11161 and BIOS 10162+11162) or (BIOS 20201+21201 and BIOS 20202+21202)

Ecology (BIOS 30312, 31312)<sup>5</sup>

Chemistry (CHEM 10171, 10172) or (CHEM 10171, 10122)

Environmental Chemistry (CHEM 20204) or approved alternative

Geology (SC 20100 with lab)

Biostatistics (BIOS 40411)<sup>13</sup>

Biology or Geology elective (3 or 4 credits)<sup>14</sup>

*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 International Studies Program.)

**Notes (a continuation from above):**

12. 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.

13. 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.

14. 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 (Second Majors):**

Students should remember that all science major programs require course work that builds upon prerequisites and thus require careful planning. A sample curriculum for second majors is given below. Note: Only the courses for the second major are listed.

**First Year\****First Semester*

CHEM 10171. Chemical Principles and Lab 4

*Second Semester*

CHEM 10122 or CHEM 10172 3/4

**Sophomore Year***First Semester*

General Biology I (10161 or 20201) 3

General Biology Lab (11161 or 21201) 1

*Second Semester*

General Biology II (10162 or 20202) 3

General Biology Lab (11162 or 21202) 1

**Junior Year***First Semester*

SC 20110. Physical Geology 4

*Second Semester*

Statistics or Biostatistics 3/4  
CHEM or SC/ENVG requirement\*\* 3

**Senior Year***First Semester*

BIOS 30312, 31312. General Ecology 4  
BIOS or ENVG or PHYS or SC Elective\*\*\* 3

*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, ENVG, or SC electives.

\*\*\*Students whose final requirement is a three-credit class in BIOS, ENVG, or SC may take SC 40491 to complete the major with the permission of the director of the ES major.

SUMMARY OF REQUIREMENTS FOR GRADUATION FOR ENVIRONMENTAL SCIENCES MAJOR	
	<i>Credits</i>
Biological Sciences	16
Chemistry	12
Geology	4
Mathematics	8
Physics	8
SC 40491	3
Science Electives	18
Total Science	69
Language	Intermediate-Level Competency (3)
WR 13100	3
Philosophy*	6
Theology*	6
History*	3
Social Science	3
Literature/Fine Arts*	3
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	

## MATHEMATICS

## Mathematics

### Chair:

Misha Gekhtman

### Associate Chair:

Juan Migliore

### Director of Graduate Studies:

Julia Knight

### Director of Undergraduate Studies:

Matthew Dyer

### Charles L. Huisking Professor of Mathematics:

Julia F. Knight

### John and Margaret McAndrews Professor

### of Mathematics:

Francois Ledrappier

### John A. Zahm, C.S.C., Professor of Mathematics

Stephen A. Stolz

### Rev. Howard J. Kenna, C.S.C., Professor of

### Mathematics

Karsten Grove

### Professors:

Peter A. Cholak; Francis X. Connolly; Jeffrey A. Diller; William G. Dwyer (emeritus); Leonid Faybusovich; Michael Gekhtman; Matthew Gursky; Alexander J. Hahn; Brian C. Hall; Qing Han; Alex A. Himonas; Alan Howard (emeritus); Xiabo Liu; Juan Migliore; Gerard K. Misiolek; Liviu Nicolaescu; Timothy O'Meara (Kenna Professor of Mathematics, emeritus, and provost emeritus); Richard R. Otter (emeritus); Claudia Polini; Barth Pollak (emeritus); Mei-Chi Shaw; Brian Smyth; Dennis M. Snow; Nancy K. Stanton; Sergei Starchenko; Laurence R. Taylor; E. Bruce Williams; Warren J. Wong (emeritus); Frederico Xavier

### Associate Professors:

Katrina Barron; Mario Borelli (emeritus); John E. Derwent (emeritus); Matthew J. Dyer; Samuel R. Evens; Abraham Goeetz (emeritus); Richard Hind; Vladeta Vuckovic (emeritus)

### Assistant Professors:

Nero Budur; David Galvin

### Associate Special Professional Faculty:

Arthur Lim

### Assistant Special Professional Faculty:

Annette Pilkington

**Program of Studies.** Mathematics has had a profound effect upon civilization since ancient times, when the legend originally inscribed on the entrance to Plato's academy was "Let no one ignorant of geometry enter here." It was equally true during the medieval period, when arithmetic and geometry constituted two of the seven subjects considered essential for a liberal education. It has been said that the second most influential book in the span of Western civilization—after the Bible—is Euclid's *Elements*. Although mathematics is usually associated with science and technology in the modern mind, it seems apparent from the writings of the great mathematicians of the 17th and 18th centuries that religious belief played a great role in their pursuit of mathematics. They saw the "system of the world" obeying mathematical laws and as a consequence felt impelled to study mathematics so as to better appreciate the world's Creator.

Mathematics continues to have a profound influence in our century. From the theory of relativity, with its applications to the study of the large-scale structure of the universe, to the development of the modern computer, with its manifold applications in science, technology and business, mathematics has played a fundamental role. It is surely the most universal of all scientific tools, and the student equipped with a strong mathematical background will be in the enviable position of being able to employ his or her expertise in any area in which rigorous thought and precision of results are mandated.

The department is dedicated to the development of undergraduate studies, to the teaching of mathematics to scientists, engineers and teachers, to graduate education and research, and to the discovery of new mathematics. The entire faculty is involved with undergraduate affairs, and students have the opportunity of associating with scholars of international repute. Mathematics at Notre Dame provides students with a discipline of the mind and a stimulation of the imagination par excellence.

Programs in mathematics prepare students for graduate studies or for professional work in fields in which mathematics plays a dominant role. They provide an excellent preparation for law school, medical school, business school and secondary school teaching. Graduates may enter careers in research institutes or industrial or government positions.

In addition to its undergraduate programs, the department offers programs of graduate study leading to the degree of doctor of philosophy, as described in the Graduate School *Bulletin of Information*.

The department recognizes that, besides those students who wish to pursue a career devoted primarily to mathematical research and teaching, many will wish to take positions in business, industry or government where they will be using their mathematical skills in close collaboration with engineers as well as biological, physical and social scientists. These students will find among the listed programs one well suited to their needs. Besides these programs a student may, in consultation with the director of undergraduate studies and the department chair, create a program especially tailored to his or her career goals.

### BACHELOR OF SCIENCE WITH A MAJOR IN MATHEMATICS

The mathematics curriculum at Notre Dame includes seven course sequences or areas of concentration within the College of Science. These programs are designed to accommodate the academic and professional interests of all mathematics majors. Brief descriptions are given below, and more detailed descriptions of these programs are available on request from the Department of Mathematics.

**College Requirements.** All must take the following College of Science courses: (CHEM 10171, 10172) or (CHEM 10171, 10122); PHYS (10310

or 10093) and PHYS (10320 or 10094); and an additional science elective.

A student who takes two semesters of organic chemistry or two semesters of general biology is only required to take PHYS (30210 or 10095) and (30220 or 10096).

### Mathematics Honors Program

This program is suited to students who are interested in graduate work in one of the mathematical sciences and to those whose career plans require a strong background in modern mathematics.

Honors Calculus I (MATH 10850)  
 Honors Calculus II (MATH 10860)  
 Honors Calculus III (MATH 20850)  
 Honors Calculus IV (MATH 20860)  
 Honors Algebra I (MATH 20810)  
 Honors Algebra II (MATH 20820)  
 Honors Algebra III (MATH 30810)  
 Honors Algebra IV (MATH 30820)  
 Honors Analysis I (MATH 30850)  
 Honors Analysis II (MATH 30860)  
 Electives (12 credit hours with six at the 4000 level)

### Mathematics Courses for the Other Programs

All other mathematics programs (except the computing program) require the following mathematics core courses:

Calculus I (MATH 10550)  
 Calculus II (MATH 10560)  
 Calculus III (MATH 20550)  
 Ordinary Differential Equations (MATH 20750)  
 Linear Algebra (MATH 20610)  
 Introduction to Math Reasoning (MATH 20630)  
 Algebra (MATH 30710)  
 Real Analysis (MATH 30750)

In addition to this basic sequence, the following courses are required for each program:

### Mathematics Career Program

This program is designed to give students a general background in mathematics. In addition to the basic sequence of courses listed above, 15 hours of mathematics electives are required, at least three of which are at the 4000 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 4000 level)

The following College of Science courses are required:

Chemistry (CHEM 10171, 10172, 20273, 20274)  
 General Biology (BIOS 20201, 21201; 20202, 21202)  
 Genetics (BIOS 20303, 21303)

## MATHEMATICS

**Mathematics and Computing Program**

This program is designed for students who plan to pursue graduate study or industrial careers in computing science. All of the mathematics core courses listed above are required, as well as 15 hours of mathematics electives, at least three hours of which are at the 40000 level.

In addition, the student must complete one of the following sequences of computing courses:

Software design option: CSE 20211, CSE 20212, CSE 20110, CSE 30331, CSE 30246, fourth elective

Theory option: CSE 20211, CSE 20212, CSE 20110, CSE 30331, CSE 30151, CSE 40113

Theory and compilers option: CSE 20211, CSE 20212, CSE 20110, CSE 30331, CSE 30151, CSE 40243

Computer architecture option: CSE 20211, CSE 20212, CSE 20221, CSE 30321, CSE 40322, fourth elective

**Mathematics Education Program**

This program is designed for students who plan a career in secondary education. The following mathematics courses are required in addition to the basic sequence listed above:

Introduction to Probability (MATH 30530)

Mathematical Statistics (ACMS 30540)

Elective in Geometry (three credit hours)

Two electives in Mathematics (6 credit hours)

(One of these classes must be at the 40000 level)

The following education courses are to be taken at Saint Mary's College: EDUC 201, 220, 340, 345, 346, 356, 451, and 475.

**Mathematics and Business Administration Program**

This program is designed to prepare students for a career in business or in the actuarial profession. The following mathematics courses are required in addition to the basic sequence:

Introduction to Probability (MATH 30530)

Mathematical Statistics (ACMS 30540)

Introduction to Operations Research (MATH 30210)

Two electives in Mathematics (including three credits at the 40000 level)<sup>1</sup>

Also required are ECON 20010 or its equivalent and the following courses from the College of Business: BASC 20100, BASC 20150, MARK 20100, MGT 20200, and one course from the following list: ACCT 20200, FIN 30210, FIN 30220, FIN 30600, MGT 40750.

**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	3.5
MATH 20610. Linear Algebra	3
MATH 20630. Introduction to Abstract Math	3
MATH 30710. Algebra	3
MATH 30750. Real Analysis	3
Mathematics Electives	12*
Mathematics Elective at the 40000 Level	3*
	<hr/>
	42 credits

\* Students majoring in finance and business economics may reduce the number of mathematics electives to 12 credits total by taking the following courses: MATH 30530, MATH 30540, MATH 60850, and a mathematics elective.

**Sample Curriculum****(Mathematics Career Program):****First Year***First Semester*

MATH 10550. Calculus I	4
CHEM 10171. Chemical Principles	4
PHYS 10310. General Physics I	4
History or Social Science <sup>1</sup>	3
WR 13100	3
Physical Education or ROTC	—
	<hr/>
	18

*Second Semester*

MATH 10560. Calculus II	4
CHEM 10172 or 10122	4
PHYS 10320. General Physics II	4
History or Social Science <sup>1</sup>	3
Philosophy or Theology	3
Physical Education or ROTC	—
	<hr/>
	18

**Sophomore Year***First Semester*

MATH 20610. Linear Algebra	3
MATH 20550. Calculus III	3.5
--Language	3
Philosophy or Theology	3
Science Elective	3
	<hr/>
	15.5

*Second Semester*

MATH 20630. Introduction to Math. Reasoning	3
MATH 20750. Ordinary Differential Equations	3.5
Mathematics Elective	3
Language	3
Philosophy or Theology	3
	<hr/>
	15.5

**Junior Year***First Semester*

MATH 30710. Algebra	3
Mathematics Elective	3
Language	3
Philosophy or Theology	3
Elective	3
	<hr/>
	15

*Second Semester*

MATH 30750. Real Analysis	3
Literature or Fine Arts	3
Electives	9
	<hr/>
	15

**Senior Year***First Semester*

Mathematics Electives	6
Electives	9
	<hr/>
	15

<sup>1</sup> 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 required of students in the SUMR program. This project is intended to give the student a better sense of how mathematics is done and used, and to develop in the student the habit of learning mathematics and its applications in an independent setting. In most cases, this work would be expected to be expository, but based on advanced-level readings. It should represent an effort that goes beyond what is found in an undergraduate course. It is especially desirable for a student to present a somewhat novel approach to an established subject, or to explore one of the many interesting connections that mathematics has with other disciplines.

## PHYSICS

During the second semester of the junior year and the first semester of the senior year, the student will work closely with a faculty advisor on a program of readings in preparation for the thesis, receiving 1 credit for each of these two semesters of work, under MATH 48800.

The thesis is to be crafted during the second semester of the senior year. The thesis must be submitted to the director of undergraduate studies by April 15 of the senior year. If the thesis is approved, the student will receive 1 credit under MATH 48900 and the citation of "Graduation with Senior Thesis" will appear on the transcript.

Students interested in writing a senior thesis should contact the director of undergraduate studies in the Department of Mathematics.

### MINOR IN ACTUARIAL SCIENCE

The Department of Mathematics offers actuarial science as an academic minor. There is a heavy demand for the business courses which are required for this minor, and students are not guaranteed registration availability for these courses. Please see the academic advisor for more information. The actuarial science minor requires completion of the following ten courses:

MATH 30530. Probability	3
ACMS 30540. Statistics	3
MATH 30610. Introduction to Financial Mathematics	3
One mathematics elective at the 30000-level or above	3
BASC 20100 or ACCT 20100. Accountancy I	3
BASC 20150 or FIN 20150. Corporate Financial Management	3
FIN 30220. Macroeconomic Analysis	3
FIN 30600. Investment Theory	3
ECON 10010. Principles of Microeconomics	3
ECON 30331. Econometrics	3

Total: 30

Among the ten courses required for the minor, up to five courses can be double-counted for the student's major.

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Mathematics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

Certain graduate courses in mathematics are open to qualified advanced undergraduates, subject to the approval of the director of undergraduate studies. Other graduate courses are described in the *Graduate School Bulletin of Information*.

## Physics

### Chair:

Christopher F. Kolda

### Director of Graduate Studies:

J. Christopher Howk

### Director of Undergraduate Studies:

Philippe Collon

### Frank M. Freimann Professor of Physics:

Michael C.F. Wiescher

### Aurora and Tom Marquez Professor of Physics:

Jacek K. Furdyna

### Grace-Ruplely II Professor of Physics:

Ikaros I. Bigi

### Frank M. Freimann Professor of Physics:

Ani Aprahamian

### Frank M. Freimann Assistant Professors of Physics:

Justin R. Crepp; Kenjiro K. Gomes

### Rev. John Cardinal O'Hara C.S.C. Professor of Physics:

Margaret Dobrowska-Furdyna

### Professors:

Mark Alber; Gerald B. Arnold (emeritus); H. Gordon Berry; Howard A. Blackstead; Samir K. Bose (emeritus); Bruce A. Bunker; Neal M. Cason (emeritus); Paul R. Chagnon (emeritus); Stefan G. Frauendorf; Emerson G. Funk (emeritus); Umesh Garg; Peter M. Garnavich; Michael D. Hildreth; Anthony K. Hyder; Boldizsár Jankó; Colin Jessop; Walter R. Johnson (emeritus); Gerald L. Jones (emeritus); V. Paul Kenney (emeritus); James J. Kolata; Christopher F. Kolda; A. Eugene Livingston; John M. LoSecco; Grant Mathews; William D. McGlenn (emeritus); James Merz; John W. Mihelich (emeritus); Kathie E. Newman; John A. Poirier (emeritus); Terrence W. Rettig; Randal C. Ruchti; Steven T. Ruggiero; Jonathan R. Sapirstein; William D. Shephard (emeritus); Carol E. Tanner; Walter J. Tomasz (emeritus); Zoltan Toroczka; Mitchell R. Wayne

### Associate Professors:

Dinshaw Balsara; Mark A. Caprio; Philippe Collon; Antonio Delgado; Morten Eskildsen; J. Christopher Howk; Paul E. Shanley (emeritus)

### Assistant Professors:

Maxime Brodeur; Manoel Couder; Justin Crepp; Kenjiro Gomes; Kevin P. Lannon; Adam Martin; Sylwia Ptasinska

**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. The computing concentration prepares the student for professions requiring working knowledge of various computer languages and experience using current computer technology. 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. The department expects to develop more concentration options as needed; 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 60.5 credits in science and mathematics is required for the physics major. The following outlines the course requirements:

General Physics A-M, B-M, C-M (PHYS 10411<sup>1</sup>, 10424, 20435<sup>2</sup>)

Intro to Chemical Principles (CHEM 10171<sup>3</sup>) and General Chemistry Biological Processes (CHEM 10122<sup>3</sup>)

Calculus I, II, III (MATH 10550,<sup>4</sup> 10560,<sup>4</sup> 20550<sup>4</sup>)

## PHYSICS

Sophomore Seminar (PHYS 23411)  
 Mathematical Methods in Physics I, II (PHYS 20451, 20452)  
 Intermediate Mechanics (PHYS 20454)  
 Electricity and Magnetism (PHYS 30471)  
 Modern Physics I (PHYS 20464)  
 Topics in Modern Physics II (PHYS 30465)  
 Modern Physics I Laboratory (PHYS 40441)  
 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 40442) or 40000-level math elective  
 Physics Elective<sup>5</sup>

**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 30481)  
 Senior Seminar (PHYS 43411)  
 Advanced Astrophysics (PHYS 40445)  
 Relativity: Special and General (PHYS 50472)

**Concentration in Applied Physics**

The requirements are that the student completes 14–17 credits of engineering courses, chosen with the aid of the Director of Undergraduate Studies.

**Requirements for the Physics-in-Medicine Major**

A total of 77.5 credits in science and mathematics is required for the physics-in-medicine major. The following outlines the course requirements:

General Physics A-M, B-M, C-M (PHYS 10411<sup>1</sup>, 10424, 20435<sup>2</sup>)  
 General Chemistry I–IV (CHEM 10171, 10172, 20273, 21273, 20274, 21274)<sup>9</sup>  
 Calculus I, II, III (MATH 10550<sup>4</sup>, 10560<sup>4</sup>, 20550<sup>4</sup>)  
 Sophomore Seminar (PHYS 23411)  
 Mathematical Methods in Physics I, II (PHYS 20451, 20452)  
 Intermediate Mechanics (PHYS 20454)  
 Electricity and Magnetism (PHYS 30471)  
 Modern Physics I (PHYS 20464)

Topics in Modern Physics II (PHYS 30465)  
 General Biology A, B (BIOS 20201<sup>6</sup>, 21201, 20202<sup>6</sup>, 21202)

Three science electives (9 credits total)<sup>7</sup>

**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 4  
 PHYS 10411, 11411 4  
 CHEM 10171, 11171 4  
 WR 13100 3  
 History or Social Science<sup>8</sup> 3  
 Physical Education or ROTC 0  
 18

*Second Semester*

MATH 10560, 12560 4  
 PHYS 10424, 11424 4  
 CHEM 10122 or 10172, 11172 3  
 History or Social Science<sup>8</sup> 3  
 Philosophy or Theology<sup>8</sup> 3  
 Physical Education or ROTC 0  
 17

**Sophomore Year**

*First Semester*  
 MATH 20550, 22550 3.5  
 PHYS 20435, 21435 4  
 PHYS 20451, 22451 3.5  
 PHYS 23411 1  
 Language 3  
 Philosophy or Theology 3  
 18

*Second Semester*

PHYS 20454 3  
 PHYS 20464 4  
 PHYS 20452, 22452 3.5  
 Language 3  
 Philosophy or Theology 3  
 16.5

**Junior Year**

*First Semester*  
 PHYS 30461 3  
 PHYS 30471 3  
 PHYS 40453 3  
 Language 3  
 Elective 3  
 15

*Second Semester*  
 [Semester Abroad]  
 or  
 Literature or Fine Arts 12  
 Electives 3  
 15

**Senior Year**

*First Semester*  
 PHYS 30465 3  
 PHYS 40441, 41441 3  
 Philosophy or Theology 3  
 Elective 3  
 12

*Second Semester*  
 Electives 12  
 12

**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 3  
 13

*Second Semester*

[Semester Abroad]  
 or  
 PHYS 30472 3  
 PHYS 40454 3  
 Physics Elective 3  
 Literature or Fine Arts 3  
 Elective 3  
 15

**Senior Year**

*First Semester*  
 PHYS 30465 3  
 PHYS 40441, 41441 3  
 PHYS 43411 1  
 Philosophy or Theology 3  
 Elective 3  
 13

*Second Semester*  
 PHYS 40442, 41442 or 40000-level MATH 3  
 Electives 12  
 15

## PHYSICS

**MAJOR: PHYSICS  
CONCENTRATION: ASTROPHYSICS****First Year** (See core physics major)**Sophomore Year***First Semester*

MATH 20550, 22550	3.5
PHYS 20435, 21435	4
PHYS 20451, 22451	3.5
PHYS 20481	3
PHYS 23411	1
Language	3

18

*Second Semester*

PHYS 20454	3
PHYS 20464	4
PHYS 20452, 22452	3.5
Language	3
Philosophy or Theology	3

16.5

**Junior Year***First Semester*

PHYS 30461	3
PHYS 30471	3
PHYS 30481 or PHYS 40445 <sup>10</sup>	3
PHYS 33411	1
PHYS 40453	3
Language	3

16

*Second Semester*

[Semester Abroad]	
or	
Theology/Philosophy	6
Literature or Fine Arts	3
Electives	6

15

**Senior Year***First Semester*

PHYS 30465	3
PHYS 40441, 41441	3
PHYS 43411	1
PHYS 30481 or PHYS 40445 <sup>10</sup>	3
Elective	3

13

*Second Semester*

PHYS 50472	3
Electives	9

12

**MAJOR: PHYSICS-IN-MEDICINE****First Year***First Semester*

MATH 10550, 12550	4
PHYS 10411, 11411	4
CHEM 10171, 11171	4
WR 13100	3
History or Social Science <sup>8</sup>	3
Physical Education or ROTC	0

18

*Second Semester*

MATH 10560, 12560	4
PHYS 10424, 11424	4
CHEM 10172, 11172	4
History or Social Science <sup>8</sup>	3
Philosophy or Theology <sup>8</sup>	3
Physical Education or ROTC	0

18

**Sophomore Year***First Semester*

BIOS 20201, 21201	4
MATH 20550, 22550	3.5
PHYS 20435, 21435	4
PHYS 23411	1
CHEM 20273, 21273	4

16.5

*Second Semester*

BIOS 20202, 21202	4
PHYS 20464	4
CHEM 20274, 21274	4
Philosophy or Theology	3

15

**Junior Year***First Semester*

BIOS 20303 <sup>7</sup>	3
BIOS 30344 <sup>7</sup>	3
PHYS 20451, 22451	3.5
Language	3

12.5

*Second Semester*

BIOS 30341 <sup>7</sup>	3
PHYS 20454	3
PHYS 20452, 22452	3.5
Literature or Fine Arts	3
Language	3

15.5

**Senior Year***First Semester*

PHYS 30465	3
PHYS 30471	3
PHYS 40371 <sup>7</sup>	3
Philosophy or Theology	3
Language	3

15

*Second Semester*

Philosophy or Theology	3
PHYS 40432 <sup>7</sup>	3
Electives	6

12

**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 PHYS 20421 (Scientific Programming), PHYS 20481 (Introduction to Astronomy and Astrophysics), PHYS 30481 (Modern Observational Techniques), PHYS 30405 (Numerical Methods), PHYS 30432 (Lasers and Modern Optics), PHYS 48480 (Undergraduate Research: The student must take at least 3 credits in research with one advisor and the credits taken must be distributed over at least two semesters), PHYS 50445 (Astrophysics), PHYS 50472 (Relativity: Special and General), MATH 40480 (Complex Variables). Physics electives cannot be double counted with requirements for the Astrophysics concentration.
6. BIOS 10161, 11161, 10162, 11162 may substitute for BIOS 20201, 21201, 20202, 21202.
7. 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 40371 (Medical Physics), PHYS 40432 (Biological Physics).
8. One of these courses must be a University Seminar.
9. Alternatives for CHEM 10171–10172 and 20273–20274 are CHEM 10181–10182 and CHEM 20283–20284.
10. PHYS 303481 (Modern Observational Techniques) is offered in the fall of even years; PHYS 40445 (Advanced Astrophysics) is offered in the fall of odd years.

**COURSE DESCRIPTIONS**

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on "Class Search" and selecting the subject *Physics*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## PREPROFESSIONAL STUDIES

**HONORS PROGRAM IN PHYSICS**

The goal of this honors program is to give our most talented students an exceptional background in physics research. Participation in this program will increase their level of commitment and productivity while preparing them for successful postgraduate work.

The program will accept junior physics majors in good academic standing who have already completed one semester of undergraduate research. Selection will be based on a research statement, transcript, and recommendation letter from their research advisor.

To graduate with this honor, students will have to complete:

1. At least three semesters and one summer of independent research either at Notre Dame or another university or research laboratory. Students are expected to apply for REU, COS-SURF or other summer funding as appropriate.
2. A thesis of at least 20 pages (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 3.25 in College of Science courses.

**Thesis Requirements:**

The final draft of the thesis will be written with the advisor, and will be submitted by April 1. 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.

Guidelines for the thesis and thesis reviewers will be provided.

The thesis learning goals are 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 Program in Physics, but would need approval by the Physics Undergraduate Research Committee.

During the first year under which this honors program is approved, seniors who are already making appropriate progress towards completing all requirements of the honors degree will automatically be considered part of the honors program and therefore eligible for the honors designation at graduation, assuming all requirements are completed.

SUMMARY OF REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN PHYSICS		
	<i>Physics</i>	<i>Physics in Medicine</i>
Mathematics	11.5	11.5
Physics	42	33
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
Education	—	—
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 and Assistant Dean:*

Rev. James K. Foster, C.S.C., M.D.

*Associate Dean:*

Sr. Kathleen Cannon, O.P.

*Assistant Dean:*

Kathleen J.S. Kolberg, Ph.D.

**Program of Studies.** The Department of Preprofessional Studies offers several programs in the two major sequences, namely the program sequence in premedical science studies and the programs in the Collegiate Sequence.

All of the programs are quite flexible and allow the student to design a curriculum, in consultation with the chair or the associate dean in the College of Science, to enable the student to enter the profession best suited for his or her talents. The program in premedical science studies enables the student to obtain an excellent preparation to enter any of the professions of medicine, dentistry or the other ancillary fields of the healing professions. The interdisciplinary programs of the collegiate sequence have been designed to offer significant flexibility to prepare students for the professions of science-education, science-business, and science-computing. All of the programs allow for a strong science background while also allowing a diverse background in the arts and humanities for individuals with a desire to obtain a broad educational background.

The major goal of this department is to provide an education in the best of liberal traditions of scientific thought and analysis, which the student can utilize for career opportunities in a variety of fields.

The program sequence in premedical science studies is a special program within the Department of Preprofessional Studies for students preparing to enter the professions of medicine, dentistry, osteopathy, veterinary medicine, podiatry, optometry, or other allied-health professions.

Notre Dame has been recognized as an accredited institution for premedical studies for more than 100 years. A proper selection of courses leading to the degree of bachelor of science will qualify the student for admission to any medical or dental school. The year before his or her expected entrance to medical school, the student takes the Medical College Admission Test or Dental Admission Test. Students taking this test should have completed the basic courses in chemistry, biology and physics. The curricula leading to the degree of bachelor of science in other departments in the College of Science also satisfy the requirements for admission to medical or dental school.

Information concerning the requirements for admission to schools of medicine, dentistry, osteopathy, veterinary medicine, optometry and podiatry, as well as information on several ancillary health careers, is available from the new office in the Center for Health Science Advising, 219 Jordan Hall of Science.

## PREPROFESSIONAL STUDIES

**BACHELOR OF SCIENCE WITH A MAJOR IN PREPROFESSIONAL STUDIES****PREMEDICAL SCIENCE SEQUENCE**

(124 semester hour credits; 64 science hour credits, minimum)

**First Year***First Semester*

WR 13100 English Writing and Rhetoric	3
MATH 10350	4
CHEM 10171	4
History or Social Science*	3
Philosophy or Theology*	3
Physical Education or ROTC	—

17

*Second Semester*

Philosophy or Elective*	3
MATH 10360	4
CHEM 10172	4
History or Social Science*	3
University Seminar	3
Physical Education or ROTC	—

17

**Sophomore Year***First Semester*

CHEM 20273	4
BIOS 20201. General Biology A	3
BIOS 21201. General Biology A Lab	1
Elective	3
Language	3

14

*Second Semester*

CHEM 20274	4
BIOS 20202. General Biology B	3
BIOS 21202. General Biology B Lab	1
Elective	3
Language	3

14

**Junior Year***First Semester*

Science Elective** (Note 3)	4
Physics (PHYS 30210, 31210)	4
Language or Elective	3
Philosophy or Elective	3
Science Elective	3

17

*Second Semester*

Science Elective** (Note 3)	3
Physics (PHYS 30220, 31220)	4
Electives	9

16

**Senior Year***First Semester*

Science Elective** (Note 3)	3
Science Elective** (Note 3)	4
Philosophy or Theology or upper-level English Literature (Note 6)	3
Electives	6

16

*Second Semester*

Science Elective** (Note 3)	4
Theology	3
Elective	3
Science Elective** (Note 3)	3

13

\* One of these courses must be a University Seminar; the literature University Seminar in English 13186 is recommended (see note 6).

\*\* See note 3.

**Notes:**

1. Most of the course instruction in the curricula of the Department of Preprofessional Studies is provided by other departments in the College of Science and other colleges of the University.

2. The elective courses in the senior year may include a thesis based on laboratory work performed in a registered course in a given department with the approval of the head of that department, who will specify the number of credits assigned to the thesis.

\*\* 3. The choice by the student of elective courses in science for the program in preprofessional studies will be based upon the requirements of the professional schools and upon the lists of courses suggested or recommended by those schools in which the student is interested; the choice will be based also upon the advice and counseling of the chair of the department. From the Medical and Dental School Requirements Books, the following courses would be the most highly recommended in addition to the five basic science courses, giving the student applicant the best science background to be a most attractive candidate to any school to which he or she wishes to apply: biochemistry, genetics, physiology, cell biology, developmental biology, and microbiology. Additional courses in higher mathematics, statistics and computer science are recommended for qualified students. Students not only must fulfill their requirements but, in the case of the sciences (mathematics, chemistry, biology and physics), also are strongly encouraged to follow the sequence of courses as listed. This sequence is designed in the light of health-related professional school requirements so that one course builds on knowledge gained from a prior course, even one from a different department; it is also structured to maintain a rigorous course load of at least two such courses per semester, with some adjustment possible in the senior year. Summer sessions, transfer credits and other modification in the regular curriculum should not be allowed to disturb this sequence of courses in the sciences without good reason.

4. For the selection of non-science electives for the programs, students should know that medicine and

the other healing professions need individuals with a diversity of educational backgrounds and a wide variety of talents and interests. All of these schools recognize the desirability of a broad education—a good foundation in the sciences (mathematics, chemistry, biology and physics), highly developed communication skills and a solid background in the social sciences and humanities.

5. Recommendation 1 of the recent Report of the Association of American Medical Colleges titled "Physicians for the 21st Century" encourages a broadening of preparation. The department continues to encourage students to follow that recommendation by using the requirements of history and social science, English and the general elective credits "to be an informed participant in contemporary society by understanding its politics, history and economics. To appreciate the many dimensions of human experience requires informed reflection upon the literature, the philosophy and the arts... of all people in our society."

6. To fulfill the medical school requirements of two semesters of English, students are required to take WR 13100 Writing and Rhetoric and one literature course taught in English. The literature course can be either a literature University Seminar in English 13186 or an upper-level literature course offered by the English Department and approved by the Department of Preprofessional Studies. Thus, if a student's University Seminar requirement is met by one of the literature options (in English), then the student will not be required to take upper-level English literature. Note, for this major only, a course in fine arts is not acceptable for the University literature/fine arts requirement. (A fine arts course will count as a general elective.)

7. In the curriculum for the program, there are listed the several courses required for the degree, including one semester each of history and social science, a course in literature, two courses in philosophy and two courses in theology. Students should remember that none of the required courses can be taken as a pass-fail option.

8. Students who have completed only six 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 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. Those students should see also the discussion on degree credit found later in this section of the Bulletin.

9. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 30210–31210.

10. Undergraduate Research (BIOS 48498 or SC 48100), Teaching Practicum (BIOS 37495), and Directed Readings (BIOS 48497) count toward the 64-hour preprofessional studies major science requirement; however, a maximum of two credits per semester and a combined total of six credit hours may be counted in fulfilling the 64-credit-hour science requirement as well as the maximum credit hours counted toward



## PREPROFESSIONAL STUDIES

graduation. Directed Readings (SCPP 46397) counts as general elective credit.

11. All students are welcome to join the Preprofessional, Premedical or Predental Societies. In addition, premedical students are encouraged to join AMSA, the American Medical Student Association.

12. All students who have had previous exposure to language will be required to take a placement examination in that language for placement in the proper course if the student wishes to continue in that language for the college requirement. If a student wishes to take a new language, of course, he or she must start from the beginning.

13. Interested parties may obtain additional information including various statistics from the department Web page. See [preprofessional.nd.edu](http://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
Writing and Rhetoric	3
Language, Intermediate-level Competency	**11
Philosophy*	6
Theology*	6
History*	3
Social Science*	3
Literature (University Seminar 13186 or upper-level English literature; see note 6)	3
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.

### COURSE DESCRIPTIONS

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

### COLLEGIATE SEQUENCE PROGRAMS

The three collegiate sequence programs, science-business, science-computing, and science-education, were instituted in 1987. These three programs allow students to obtain a strong science background while simultaneously preparing them for professions in health care, business, computing or education.

### SCIENCE-BUSINESS COLLEGIATE SEQUENCE

The Science-Business Collegiate Sequence in the Department of Preprofessional Studies is an individualized course of study which incorporates courses from the basic areas of business along with the four basic areas of science. The major prepares students to pursue health care professional education such as medical school, dental school, public health, or health care administration. It also enables students to attain a diversified background to enter an MBA program leading to a position in the scientific or health professions business area. It is also a complete and sufficient program to enable the B.S. graduate of the sequence to enter the scientific business market immediately upon graduation.

Information on the areas of public health and hospital administration, as well as the business needs of the pharmaceutical, biological and chemical industries are available in the office of the Department of Health Professions, 219 Jordan Hall of Science.

The other departments in the College of Science as well as the colleges of arts and letters and business administration provide all course instruction in the curricula of the Science-Business Collegiate Sequence.

### BACHELOR OF SCIENCE WITH A MAJOR IN SCIENCE-BUSINESS

All science-business majors take the following basic sequence of science courses:

General Biology (BIOS 20201–20202 and 21201 and 21202)<sup>1</sup>

CHEM 10171 and 11171 and (10172 and 11172 or 10122) and two of the following: CHEM 20273 and 21273, CHEM 20274 and 21274, ENVG 20110

Calculus (MATH 10350–10360 or 10550–10560)<sup>1,2</sup>

Physics (PHYS 30210–30220)<sup>3</sup> and 31210, 31220

Statistics (ACMS 20340 or BIOS 40411)

They also are required to take 20–21 credits of science electives,<sup>4</sup> completing a minimum of 64 credits of science courses.

Also required for the major are the following business and economics courses:

Principles of Microeconomics (ECON 10010 or 20010)<sup>5,6</sup>

Accountancy I (ACCT 20100)

Corporate Financial Management (FIN 20150)

Principles of Management (MGT 20200)

Principles of Marketing (MARK 20100)

One upper-level business elective for which prerequisites are completed.

Requirements for the program are summarized in the table following this section.

### Notes:

1. Equivalent or higher-level sequences in science may be substituted, e.g., BIOS 10161–10162 for BIOS 20201–20202 or MATH 10850–10860 for MATH 10550–10560.

2. Students who have completed only six hours of mathematics in their first year may transfer into the program, but they will be required to complete a mathematics sequence equivalent to MATH 10350, 10360 or MATH 10550, 10560. Students having taken MATH 10250, (or 10260 or 10270) may do this by taking MATH 10360, while those who have taken only one semester of lower-level calculus should take both MATH 10350, 10360. (See also the discussion on science degree credit, found later in this section of the Bulletin.)

3. PHYS 10310–10320 or PHYS 10411, 20435 may be substituted for PHYS 30210–30220.

4. The choice by the student of the elective courses in science for the program will be discussed with the student and will be based on the future industrial or health professions business interests of the student. Any major-level College of Science courses (i.e., those taken to meet science-major requirements and not those designated as “Recommended University electives”) and that are not being used to fulfill other specific graduation requirements can be used to satisfy the “Science Elective” requirement. Major-level geology courses cross-listed as science courses may be taken as science electives. Students are restricted to no more than two credits per semester (six total) for science credit and three credits per semester (nine total) for graduation credit of courses such as Undergraduate Research or Directed Readings.

5. The economics requirement for this major is fulfilled by taking Principles of Microeconomics either in the first year (ECON 10010) or in the sophomore year (ECON 20010). Note: The course ECON 13181 (Social Science University Seminar) will not fulfill the economics requirement for this major.

6. For this major, the University social science requirement will be fulfilled by the required economics course. Additional social science courses are recommended and will count toward the student’s general electives.

**Suggested Curriculum for the Degree of Bachelor of Science in the Science-Business Collegiate Sequence (124 semester hour credits: 64 science hour credits, minimum)**

### First Year

First Semester	
CHEM 10171, 11171	4
MATH 10350 or 10550. Calculus (Note 2)	4
WR 13100	3
Theology*	3
History*	3
Physical Education/ROTC	0

## PREPROFESSIONAL STUDIES

<i>Second Semester</i>	
CHEM 10172, 11172 or 10122	4(3)
MATH 10360 or 10560 Calculus	4
Fine Arts or Literature*	3
Philosophy*	3
ECON 10010*	3
Physical Education/ROTC	0
	<hr/>
	17

**Sophomore Year**

<i>First Semester</i>	
BIOS 20201 General Biology A	3
BIOS 21201 General Biology A Lab	1
CHEM 20273, 21273 (or SC 20110)	4
Language	3
Elective	3
	<hr/>
	14

*Second Semester*

BIOS 20202 General Biology B	3
BIOS 21202 General Biology B – Lab	1
CHEM 20274, 21274 or CHEM 10122	4 (3)
Language	3
Philosophy	3
	<hr/>
	14 (13)

**Junior Year**

<i>First Semester</i>	
Science Elective or	
ENVG 20110 Physical Geology	3 (4)
PHYS 30210, 31210 General Physics I	4
MGT 20200	3
Theology	3
Science Elective	3
	<hr/>
	16 (17)

*Second Semester*

BIOS 40411. Biostatistics or	
ACMS 20340 Statistics for Life Sciences	4 (3)
PHYS 30220, 31220 General Physics II	4
ACCT 20100	3
Elective	3
Science Elective	3
	<hr/>
	17 (16)

**Senior Year**

<i>First Semester</i>	
Science Electives	6
Elective	3
FIN 20150	3
MARK 20100	3
	<hr/>
	15
<i>Second Semester</i>	
Science Electives	6
Electives	6
Business Elective	3
	<hr/>
	15

\* One of these courses must be a University Seminar.

**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 20201–20202 and 21201 and 21202) <sup>1</sup>
CHEM 10171 and 11171, 10172 and 11172 or 10122 and two of (CHEM 20273 and 21273, CHEM 20274 and 21274, SC 20110)
Calculus (MATH 10350–10360 or 10550–10560) <sup>1,2</sup>
Physics (PHYS 30210–30220 and 31210–31220) <sup>3</sup> and 3121, 31220
Statistics (ACMS 20340 or BIOS 40411)

They also are required to take 20–21 credits of science elective,<sup>4</sup> 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., BIOS 10161–10162 for BIOS 20201–20202 or 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 30210–30220.

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 of courses such as Undergraduate Research or Directed Readings in the science elective total.

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**

<i>First Semester</i>	
CHEM 10171 and 11171	4
MATH 10550 Calculus (Note 2)	4
WR 13100	3
Theology*	3
History*	3
Physical Education/ROTC	—
	<hr/>
	17

*Second Semester*

CHEM 10172 and 11172 or 10122	4 (3)
MATH 10560 Calculus	4
Fine Arts/Literature*	3
Philosophy*	3
Social Science*	3
Physical Education/ROTC	—
	<hr/>
	17 (16)

**Sophomore Year**

<i>First Semester</i>	
BIOS 20201 General Biology A	3
BIOS 21201 General Biology A Lab	1
CHEM 20273 and 21273 or SC 20110	4
Language	3
CSE 20232 (Advanced Programming)	4
	<hr/>
	15

*Second Semester*

BIOS 20202 General Biology B	3
BIOS 21202 General Biology B Lab	1
CHEM 20274, 21274 (or CHEM 10122)	4
Language	3
Elective	3
	<hr/>
	14

## PREPROFESSIONAL STUDIES

**Junior Year***First Semester*

Science Elective	3
CSE 20211 Fundamentals of Computing	4
PHYS 30210, 31210 General Physics I	4
Theology	3
Elective (or Language)	3

17

*Second Semester*

BIOS 30411 Biostatistics or	
ACMS 20340 Statistics for Life Sciences	4 (3)
PHYS 30220, 31220 General Physics II	4
CSE 20212 Fundamentals of Computing II	4
Philosophy	3

15 (14)

**Senior Year***First Semester*

Science Electives	9
CSE 30331 Data Structures or	
CSE 20110 Discrete Mathematics	3
Electives	3

15

*Second Semester*

Science Electives	9
CSE 30246 Database Concepts	3
Electives	3

15

\* 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 office, 174 Hurley 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 20201–20202 and 21201 and 21202)<sup>1</sup>

CHEM 10171 and 10172 and [CHEM 20273 and 21273, CHEM 20274 and 21274] or (CHEM 20273 AND 21273, ENVG 20110) OR (ENVG 20110, ENVG 20120)]

Calculus (MATH 10350–10360 or 10550–10560)<sup>1,2</sup>

Physics (PHYS 30210–30220)<sup>3</sup> and 31210, 31220

They also are required to take 20 credits of science electives,<sup>4,5</sup> 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

SUMMARY OF MINIMAL REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN A COLLEGIATE SEQUENCE MAJOR

	<i>Science-Business</i>	<i>Science-Computing</i>	<i>Science-Education</i>
Biological Sciences	8	8	8
Chemistry	8	8	8
Organic Chemistry/Geology	8	8	8
Mathematics	8	8	8
Physics	8	8	8
Statistics: ACMS 20340 or BIOS 40411	3–4	3–4	0
Science Electives	20–21	20–21	20
<b>Total Required Science</b>	<b>64</b>	<b>64</b>	<b>60</b>
Business Courses	15	0	0
Computing Courses	0	14–15	0
Education Courses	0	0	33
Language	Intermediate Level Competency		
Writing and Rhetoric	3	3	3
Philosophy*	6	6	6
Theology*	6	6	6
History*	3	3	3
Social Sciences	3	3	3
Literature/Fine Arts	3	3	3
Free Electives	10**	10**	0**
Total	124	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.

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.

## SPECIAL PROGRAMS

Requirements for the program are summarized in the table found two pages back.

**Notes:**

1. *Equivalent or higher-level sequences in science may be substituted, e.g., BIOS 10161–10162 for BIOS 20201–20202 or 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 30210–30220.*

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 of courses such as Undergraduate Research or Directed Readings in the science elective total.*

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
WR 13100	3
Theology*	3
History*	3
Physical Education	—
	17

*Second Semester*

CHEM 10172 and 11172	4
MATH 10360 or 10560 Calculus	4
Elective*	3
Philosophy*	3
Social Science*	3
Physical Education	—
	17

**Sophomore Year***First Semester*

BIOS 20201 General Biology A	3
BIOS 21201 General Biology A Lab	1
ENVG 20110 Physical Geology	—
or	
CHEM 20273 and 21273	4
Language	3
Education 201F (SMC)	3
Elective	3
	17

*Second Semester*

BIOS 20202 General Biology B	3
BIOS 21202 General Biology B Lab	1
CHEM 20274 and 21274,	4 (3)
or CHEM 10122	
Language or Elective	3
Fine Arts/Literature	3
EDUC 220 (SMC)	3
	17 (16)

**Junior Year***First Semester*

PHYS 30210, 31210 General Physics I	4
Science Electives	6
EDUC 345 (SMC)	3
EDUC 356 (SMC)	3
	16

*Second Semester*

PHYS 30220, 31220 General Physics 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
Philosophy	3
Theology	3
	15

*Second Semester*

EDUC 475 (SMC)	12
	12

\* One of these must be a University Seminar

## Special Programs

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**DOUBLE MAJORS IN SCIENCE**

In certain instances, students have the option of pursuing majors in two departments in the College of Science. Combinations that are normally approved include: Biological Sciences with Chemistry; Biological Sciences with Mathematics; Biological Sciences with Physics; Biochemistry with Mathematics; Biochemistry with Physics; Chemistry with Mathematics; Chemistry with Physics; Environmental Sciences (first major) with Mathematics; Mathematics with Physics; and Science Business, Science Computing, Science Education with supplementary major in ACMS or Statistics. Examples of combinations that are normally forbidden include: Preprofessional Studies with any other science majors, Collegiate Sequence majors (Science Business, Science Computing, Science Education) with any other science majors except supplementary majors in ACMS and Statistics, parallel subprograms such as Mathematics and Life Sciences with Physics-in-Medicine and either of those with Biological Sciences or Biochemistry, any majors among Mathematics, ACMS and Statistics. All requirements of each major must be met, with no exceptions. Failing to complete a required course terminates that major for a student. Every student who wishes to major in two departments in the College of Science must prepare an agenda of specific courses to be taken, which both advisors and the dean must approve. This should be done as early as possible, but absolutely no later than the seventh day of the senior year. In certain instances, a student may possibly receive approval of a normally forbidden combination of majors, but only if a specific program has been set up by the seventh day of the sophomore year.

All double major programs in science are extremely challenging programs that require that the student take four or five science courses at a time. Thus, only students of superior scholastic ability should consider this as an option.

Students are warned that it is almost certain that completing a double major in two sciences will require total credits well over the college minimum of 124. Conflicts in scheduling of required courses may occur; neither the college nor the departments undertake to reschedule courses for the sake of double majors. For these reasons, it must be emphasized that completing a double major may well require more than four years. Only one degree is awarded (degrees in science do not specify a field).

## DUAL DEGREE PROGRAM WITH THE COLLEGE OF ENGINEERING

## 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:

Brian Lohr  
 Director of Admissions  
 Master of Business Administration Program  
 Malgorzata Dobrowolska-Furdyna  
 Associate Dean, College of Science

**Program of Studies.** The dual degree five-year program in the Mendoza College of Business and the College of Science enables the student to earn the master of business administration and bachelor of science degrees in a major in one of the five undergraduate departments in the College of Science.

This program, instituted in 1994, offers students the opportunity to better integrate studies in science and in management. The student completing this program will have a background in management as well as the first professional degree in one of the undergraduate majors of the College of Science. Because it is a demanding program, only those students of superior scholastic ability who have the aptitude, motivation and maturity necessary for the combined graduate and undergraduate program should apply. Those with outstanding internship experiences in business will be looked upon favorably. Advisors for the program are available for consultation about the advisability of applying for the program and about meeting the particular needs of students pursuing this program.

The program is open only to those currently enrolled Notre Dame students who have completed three years of an undergraduate science first major. Students interested in making application for the MBA/Science program should apply to the MBA program during their junior year. They should take the GMAT by December of their junior year. All candidates must schedule a personal interview as a part of the MBA admissions process. Students must also declare their intentions to the dean's office in the College of Science and request that a dean's eligibility letter be sent to the MBA Office for them.

An applicant who is not admitted to the dual degree MBA/Science program continues in the undergraduate program and completes his or her science major in the usual four-year period.

As a general guide, it is expected that a student accepted to this program will take two courses for the undergraduate degree during the summer session

following his or her junior year. Every dual-degree student is also expected to participate in the orientation for the MBA program. This program will occupy the entire day for the two weeks prior to the first day of classes. Orientation is mandatory for all students beginning the MBA program.

Students in the five-year science/MBA program are also required to:

- (1) Complete a minimum of 48 MBA credit hours and maintain a GPA of at least 3.0 to successfully complete the program.
- (2) Take all MBA courses in their fourth year.
- (3) Maintain full-time student status (minimum 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
Accit Review Workshop*	0
(Science Undergraduate Requirements)	6)

### Senior Year—(Science Undergraduate Requirements Each Semester 3–7)

<i>First Semester, Module 1:</i>	
ACCT 60100. Financial Accounting	2
MBET 60340. Conceptual Foundation of Business Ethics	2
MGT 60100. Statistics	2
MGT 60300. Organizational Behavior	2
<i>First Semester, Interterm Week:</i>	
Professional Development Seminar	0
Communications Seminar++	1
<i>First Semester, Module 2:</i>	
ACCT 60200. Cost Accounting	2
FIN 60400. Finance I	2
FIN 60210. Microeconomic Analysis	2
MARK 60100. Marketing Management	2
<i>Second Semester, Module 3:</i>	
FIN 70600. Finance II	2
FIN 60220. Macroeconomic Analysis	2
MGT 60900. Strategic Decision Making	2
Free Elective	2
<i>Second Semester, Interterm Week:</i>	
Values in Decision Making	1
Elective Course	1
<i>Second Semester, Module 4:</i>	
MGT 60400. Leadership and Teams	2
MGT 60700. Operations Management	2

### Fifth Year—(Science Undergraduate Requirements Each Semester 3–7)

<i>First Semester, Module 1:</i>	
MGT 60200. Problem Solving	2
Management Communication Elective I	2
Free Elective*	2
<i>Interterm Week:</i>	

OPTIONAL: Two one-credit-hour electives (TBD) OR	
Corporate Case Studies OR	
Offshore Program: China or Brussels	2
<i>First Semester, Module 2:</i>	
Ethics Elective	2
Management Communication Elective II	2
<i>Second Semester, Module 3:</i>	
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.	
<i>Second Semester, Interterm Week:</i>	
(OPTIONAL: Two one-credit-hour electives OR	
Corporate Case Studies OR	
Offshore Program: China or Brussels	2)
<i>Second Semester, Module 4:</i>	
Free Electives	4
(Floating Optional Elective	2)

+See “Arts and Letters Core” on the first page of the *College of Engineering* section.

++Special onetwo-week courses. All other MBA courses are seven weeks in length.

\*Occurs during August Orientation

Total for both degrees: 126–132 undergraduate, 48 MBA

Students involved in the MBA/Science program will complete their undergraduate program while completing MBA requirements. MBA course work will not apply to the undergraduate degree. Sample schedules for particular majors are available from advisors or the dean's office. Students who are behind in the completion of their major requirements are strongly recommended to obtain permission and advising before applying to the joint program.

## Nondepartmental Courses

### COURSE DESCRIPTIONS

All of the courses associated with this academic program can be found online at [registrar.nd.edu/students/class\\_search.php](http://registrar.nd.edu/students/class_search.php). The scheduled classes for a given semester may be found by clicking on “Class Search” and selecting the subject *Science (Non-departmental)*. Course descriptions can be found by clicking on the subject code and course number in the search results.

## Science Degree Credit

Courses are generally taken in the College of Science for one of three reasons: (1) for students in either the College of Arts and Letters, or the Mendoza College of Business, or the School of Architecture, to fulfill a University requirement; (2) for students in either the College of Engineering or the College of Science to fulfill a college requirement; and (3) for students in the College of Science, to fulfill a major requirement. As a result, the College of Science offers different sequences of courses which overlap considerably in content but not level. Thus it is possible for a student who has changed his or her college or major to have taken two courses which overlap in content. Both courses will appear on the student's transcript, but only one will count for degree credit.

As a guideline for the student and the student's advisors, listed below are the groups of courses that overlap considerably in content. (Courses within the same group are shown in the same row and are also enclosed within parentheses; courses listed within the same column generally show a typical normal progression through course work.) In every case, only one course per group should be counted for degree credit. Generally, only the course taken last should be counted. Students and advisors are warned not to use these groups when moving between course sequences but rather to seek advice from the offering department or the College of Science office.

For overlap with courses no longer taught in the year of publication of this *Bulletin*, please refer to previous editions of this *Bulletin*.

Credit is not given for both ACMS and MATH courses with the numbers 10140, 10150, 20210, 20340, 20610, 20750, 30440, 30530, 30540, 30610, or any course cross-listed between ACMS and MATH. In the following table the restrictions on MATH courses numbered 10140 and 20340 also apply to the ACMS courses with the same numbers.

**Applied and Computational  
Mathematics and Statistics**

(10140 10141 10145	20340		BIOS 40411	30540	MATH 30540)
	20210		MATH 20210)		
(	20620		MATH 20610)		
(	20550		PHYS 20451)		
(				30530	MATH 30530)
(				30610	MATH 30610)
(	20750	MATH 20750	PHYS 20452)		

**Biological Sciences**

(10101 10110	10156	10161		10191	10098	20201)
(10107 10117 10118 10119	10155	10162			10099	20202)
(		20241	30341)			
(		20250	20303)			
(			40342)			

**Chemistry and Biochemistry**

(10101 10113	10115	10117	10121	10125	10171	10181)
(10102 10114	10116	10118	10122	10126)		
(			20223	20235	20247	10172 10182)
(			20224	20236	20248	20273 20283)
(						20274 20284)
(			40420	30341	60521)	
(				30342	60522)	

**Mathematics**

(10120 10110)						
(10250 10240		10350	10550	10850	10860	10460)
(	10260	10270	10360	10560	10860	10460)
(		20210	ACMS 20210)			
(		20480	20610	ACMS 20620	20580	20810)
(		20480	20610	ACMS 20620	20580	20570)
(				20550		20850)
(			20750	ACMS 20750	30650)	
(ACMS 10140 / 10141 / 10145		ACMS 20340	BIOS 40411	30540	ACMS 30540)	
(				30530	ACMS 30530)	
(				30610	ACMS 30610)	
(					30390	40390)

**Physics**

(10111 10310		10411	30210	10091	10093	10095)
(10222 10320	10422	20435	30220	10092	10094	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

GREGORY P. CRAWFORD, Ph.D.

*Dean of the College of Science*

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*Assistant Dean of the College of Science*

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FRANCIS J. CASTELLINO, Ph.D.

*Director of the W.M. Keck Center for Transgene Research*

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MR. JAMES C. MARCUCCILLI

*Fort Wayne, Indiana*

MR. LAWRENCE A. MASTROVICH

*Coto de Caza, California*

DR. JILL B. McCORMACK

*Glen Ellyn, Illinois*

MR. JAMES E. McGRAW

*Savannah, Georgia*

DR. ANN HANK MONAHAN

*Woodland, Minnesota*

MR. JAMES M. MORRISON

*Valparaiso, Indiana*

MR. CHRISTOPHER J. MURPHY

*Omaha, Nebraska*

DR. BRUCE M. NAKFOOR

*Naples, Florida*

DR. MIKE PARSEGHIAN

*Tucson, Arizona*

DR. JOHN G. PASSARELLI

*Laurel Hollow, New York*

MR. RICHARD T. RILEY

*West Chester, Pennsylvania*

DR. MICHAEL D. RYAN

*Mequon, Wisconsin*

DR. ANDREW C. SERAZIN

*Seattle, Washington*

DR. CAROL LALLY SHIELDS

*Bryn Mawr, Pennsylvania*

MR. DENIS E. SPRINGER

*Inverness, Illinois*

DR. WILLIAM S. STAVROPOULOS

*Naples, Florida*

MR. DAVID L. TAICLET

*Clarkson Valley, Missouri*

MR. RAYMOND C. TOWER

*Glenview, Illinois*

DR. ELEANOR M. WALKER

*Troy, Michigan*

MR. PAUL F. WARE JR.

*Concord, Massachusetts*

MS. KATIE O. WASHINGTON

*Baltimore, Maryland*

DR. NORBERT L. WIECH

*Phoenix, Maryland*

DR. JOHN C. YORK II

*Canfield, Ohio*



# Faculty

*The following is the official faculty roster for the 2013–14 academic year as of July 9, 2013. 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.*

**Ruth Maree Abbey.** *Professor, Political Science.* Bachelor of Arts, Monash University, 1984; Master of Arts, McGill University, 1989; Doctor of Arts, *ibid.*, 1995 (2005)

**Christopher Paul Abram.** *Associate Professor, English.* Bachelor of Arts, University of Cambridge, 1998; Master of Philosophy, *ibid.*, 1999; Philosophiae Doctor, *ibid.*, 2004 (2013)

**Nicole Louise Achee.** *Research Associate Professor, Biological Sciences.* Master of Science, Texas A&M University, 1995; Philosophiae Doctor, Uniformed Services Health Sci., 2004 (2013)

**Carl Bruce Ackermann.** *Professional Specialist, Finance.* Bachelor of Arts (Latin), Amherst College, 1984; Philosophiae Doctor, UNC at Chapel Hill, 2000 (1998)

**David Acton.** *Assistant Professional Specialist, Snite Museum; Curator of Photography.* Bachelor of Arts, University of Michigan, 1976; Master of Arts, *ibid.*, 1979; Philosophiae Doctor, *ibid.*, 1993 (2013)

**Idris Adjerid.** *Instructor, Management.* Bachelor of Arts, Virginia Polytechnic Institute, 2005; Master of Business Admin, *ibid.*, 2008 (2013)

**John Felix Affleck-Graves.** *Executive Vice President; The Notre Dame Chair in Finance; Professor, Finance.* B.S. Mathematics, University of Cape Town, 1972; Master of Science, *ibid.*, 1974; Philosophiae Doctor, *ibid.*, 1977; B.S. Commerce, *ibid.*, 1982 (1986)

**Lauren Ajamie.** *Assistant Librarian, Hesburgh Libraries; Electronic Resources Librarian.* Bachelor of Arts, Barnard College, 2006; Master of Library & Info Sci, Univ of Oklahoma-Norman, 2012 (2012)

**Maurizio Albahari.** *Assistant Professor, Anthropology.* Bachelor of Arts, Università Degli Studi, 2000; Master of Arts, Univ California Irvine, 2002; Philosophiae Doctor, *ibid.*, 2006 (2008)

**Mark S. Alber.** *The Vincent J. Duncan Family Professor of Applied Mathematics; Professor, Applied Computational Mathematics & Statistics; Director, Center for Study of Biocomplexity; Concurrent Professor, Computer Science and Engineering; Concurrent Professor, Physics.* Master of Science, Moscow Institute of Technology, 1983; Philosophiae Doctor, Univ of Pennsylvania, 1990 (1990)

**Simeon Alder.** *Assistant Professor, Department of Economics; Fellow, Kellogg Institute for International Studies.* Bachelor of Arts, Graduate Inst of Int’L Studies, 1998; Master of Arts, UCLA, 2005; Philosophiae Doctor, *ibid.*, 2009 (2009)

**Roger Paul Alford.** *Professor, Law School; Fellow, Kellogg Institute for International Studies; Associate Dean for International and Graduate Programs, Law School.* Bachelor of Arts, Baylor University, 1985; Master of Divinity, Southern Baptist Theological S, 1988; Juris Doctor, New York University, 1991 (2012)

**Robert Lawrence Alworth.** *Assistant Professional Specialist, College of Engineering.* Bach of Sci in Mech Engr, University of Notre Dame, 1972; Master of Science, Cornell University, 1974 (2009)

**Joseph Phillip Amar.** *Professor, Classics; Concurrent Professor, Theology.* Philosophiae Doctor, Catholic University of America, 1988 (1988)

**George Alex Ambrose.** *Assistant Professional Specialist, First Year of Studies; Assistant Professor, Military Science.* Bachelor of Arts, Rutgers State University of NJ, 2002; Master of Education, *ibid.*, 2003 (2008)

**Karl P. Ameriks.** *The McMahon-Hank Chair in Philosophy; Professor, Philosophy.* Bachelor of Arts, Yale University, 1969; Philosophiae Doctor, *ibid.*, 1973 (1973)

**Geraldine A. Ameriks.** *Associate Professional Specialist, Romance Languages and Literatures; Associate Teaching Professor.* Bachelor of Arts, Smith College, 1969; Master of Arts, Stanford University, 1971 (1980)

**Selena Kathleen Anders.** *Assistant Professional Specialist, School of Architecture; Professor of the Practice.* Bachelor of Arts, DePaul University, 2005; Master of Arts in Architecture, University of Notre Dame, 2009 (2009)

**Thomas Francis Anderson.** *Dr. Scholl Associate Prof. of Romance Languages & Literatures; Professor, Romance Languages and Literatures; Fellow, Institute for Latino Studies; Fellow, Kellogg Institute for International Studies; Department Chair, Romance Languages and Literatures.* Bachelor of Arts, Bowdoin College, 1992; Master of Arts, Univ of Pennsylvania, 1994; Philosophiae Doctor, *ibid.*, 1998 (1998)

**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)

**Megan Andrew.** *Assistant Professor, Sociology.* Bachelor of Science, Utah State University, 1999; Master of Science, Univ of Wisconsin-Madison, 2004; Philosophiae Doctor, *ibid.*, 2009 (2011)

**Wendy Angst.** *Associate Professional Specialist, Management.* Bachelor of Science, Michigan State University, 1995; Master of Business Admin, University of La Verne, 2000 (2010)

**Corey M. Angst.** *Associate Professor, Management.* 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)

**Panos J. Antsaklis.** *H. Clifford & Evelyn A. Brosey II Chair; Professor, Electrical Engineering; Concurrent Professor, Applied Computational Mathematics & Statistics; Concurrent Professor, Applied Computational Mathematics.* Diploma, Natl Technical Univ of Athens, 1972; Master of Science, Brown University, 1974; Philosophiae Doctor, *ibid.*, 1977 (1980)

**Robert Scott Appleby.** *The John M. Regan Jr. Director; Professor, History; Director, Joan B. Kroc Institute for International Peace; Fellow, Joan B. Kroc Institute for International Peace; Fellow, Kellogg Institute for International Studies.* Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, University of Chicago, 1979; Philosophiae Doctor, *ibid.*, 1985 (1994)

**Ani Aprahamian.** *The Frank M. Freimann Professor of Physics; Professor, Physics.* Bachelor of Arts, Clark University, 1980; Philosophiae Doctor, *ibid.*, 1986 (1989)

## FACULTY

**Francisco Jose Aragon.** *Assistant Professional Specialist, 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)

**J. Douglas Archer.** *Librarian, Hesburgh Libraries.* Bachelor of Arts, Duke University, 1968; Master of Divinity, Colgate Rochester Divinity Sch, 1972; Master in Library Science, Western Michigan University, 1981 (1978)

**Elizabeth A. Archie.** *Clare Booth Luce Assistant Professor; Assistant Professor, Biological Sciences.* Bachelor of Arts, Bowdoin College, 1997; Philosophiae Doctor, Duke University, 2005 (2009)

**Arezoo Ardekani.** *John Cardinal O'Hara, C.S.C Assistant Professor of Aerospace and Mechanical Engineering; Assistant Professor, Aerospace and Mechanical Engineering.* Bachelor of Science, Sharif Univ. of Technology, 2003; Master of Science, Univ California Irvine, 2005; Philosophiae Doctor, *ibid.*, 2009 (2011)

**Neil Arner.** *Assistant Professor, Theology.* Bachelor of Science, Georgia Institute of Technology, 2001; Master of Divinity, Princeton Theological Seminary, 2006; Master of Theological Studies, Yale University-Div School, 2007; Undeclared, East Tennessee State University, (2013)

**Peri E. Arnold.** *Professor, Political Science.* Bachelor of Arts, Roosevelt University, 1964; Master of Arts, University of Chicago, 1967; Philosophiae Doctor, *ibid.*, 1972 (1972)

**Julie Ellen Arnott.** *Librarian, Hesburgh Libraries.* Bachelor of Arts, University of Missouri-St. Lou, 1976; M.S. Library Science, Univ of IL Urbana-Champaign, 1986 (2005)

**Carolina Arroyo.** *Associate Professional Specialist, Political Science.* Bachelor of Arts, SUNY at Buffalo, 1983; Master of Arts, Stanford University, 1990 (1996)

**Brandon Lee Ashfeld.** *Assistant Professor, Chemistry and Biochemistry.* Bachelor of Science, University of Minnesota, 1998; Philosophiae Doctor, Univ of Texas-Austin, 2004 (2007)

**James Matthew Ashley.** *Associate Professor, Theology; Fellow, Center for Social Concerns.* Bachelor of Science, Saint Louis University, 1982; Master of Teacher Science, Weston School of Theology, 1988; Philosophiae Doctor, University of Chicago, 1993 (1993)

**Ann W. Astell.** *Professor, Theology.* Bachelor of Science, Marquette University, 1974; Master of Arts, *ibid.*, 1981; Philosophiae Doctor, Univ of Wisconsin-Madison, 1987 (2007)

**Hafiz M. Atassi.** *The Viola D. Hank Chair in Aerospace and Mechanical Engineering; Professor, Aerospace and Mechanical Engineering.* Philosophiae Doctor, University of Paris I, 1966 (1969)

**Robert Audi.** *The David E. Gallo Chair in Business Ethics; Professor, Philosophy.* Bachelor of Arts, Colgate University, 1963; Master of Arts, University of Michigan, 1965; Philosophiae Doctor, *ibid.*, 1967 (2003)

**Yury Petrovich Avvakumov.** *Assistant Professor, Theology.* Master of Arts, Leningrad State University, 1981; Philosophiae Doctor, Russian Theological Seminary, 1990; Philosophiae Doctor, Ludwig-Maximilians Univ Munich, 2001 (2009)

**Brad Alan Badertscher.** *Associate Professor, Accountancy.* Bachelor of Arts, Univ. of Nebraska at Kearney, 2001; Master of Business Admin, University of Iowa, 2003; Master of Business Admin, *ibid.*, 2003; Philosophiae Doctor, *ibid.*, 2007 (2007)

**Colleen Margaret Baker.** *Concurrent Associate Professor, Finance; Associate Professor, Law School.* Bachelor of Arts, University of Notre Dame, 1995; Master of Science, Carnegie Mellon University, 1998; Juris Doctor, University of Virginia, 2004; Master of Business Admin, *ibid.*, 2004 (2010)

**Brian M. Baker.** *Professor, Chemistry and Biochemistry; Associate Dean of Research and Graduate Studies, College of Science.* Bachelor of Science, New Mexico State Univ. Park, 1992; Philosophiae Doctor, University of Iowa, 1997 (2001)

**Harriet E. Baldwin.** *Associate Professional Specialist, College of Arts and Letters.* Bachelor of Science, Kansas State University, 1966 (1980)

**Aaron Bradley Bales.** *Assistant Librarian, Hesburgh Libraries.* Bachelor of Arts, Harvard University, 1988; Master in Library Science, Indiana Univ-Bloomington, 2001 (1992)

**Christopher Gordon Ball.** *Assistant 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.** *Associate Professor, Physics.* Bachelor of Science, Jai Hind College, 1977; Master of Science, Indian Inst of Tech Kanpur, 1982; Master of Science, University of Chicago, 1986; Philosophiae Doctor, Univ of IL Urbana-Champaign, 1990 (2001)

**Rashna Dinshaw Balsara.** *Research Assistant Professor, Center For Transgene Research.* Bachelor of Science, University of Bombay, 1985; Master of Science, *ibid.*, 1991; Philosophiae Doctor, *ibid.*, 1998 (2007)

**Zygmunt Guido Baranski.** *Professor, Romance Languages and Literatures; Notre Dame Professor of Dante and Italian Studies.* Bachelor of Arts, University of Hull, 1973; Philosophiae Doctor, *ibid.*, 1976 (2007)

**Sotirios Angel Barber.** *Professor, Political Science.* Bachelor of Arts, Univ of IL Urbana-Champaign, 1964; Master of Arts, University of Chicago, 1967; Philosophiae Doctor, *ibid.*, 1973 (1986)

**Christopher Andrew Baron.** *Assistant Professor, Classics.* Bachelor of Arts (Latin), Illinois Wesleyan University, 1995; Philosophiae Doctor, Univ of Pennsylvania, 2006 (2006)

**Matthew James Barrett.** *Professor, Law School.* Bachelor of Business Admin., University of Notre Dame, 1982; Juris Doctor, *ibid.*, 1985; Juris Doctor, *ibid.*, 1985 (1990)

**Amy Coney Barrett.** *Professor, Law School.* Bachelor of Arts, Rhodes College, 1994; Juris Doctor, University of Notre Dame, 1997 (2002)

**Katrina D. Barron.** *Associate Professor, Mathematics.* B.S. Mathematics, University of Chicago, 1986; B.S. Physics, *ibid.*, 1987; Philosophiae Doctor, Rutgers University, 1996 (2001)

**Kevin Barry.** *Professional Specialist, Kaneb Center for Teaching and Learning; Director, Kaneb Center for Teaching and Learning; Fellow, Institute for Latino Studies.* Bachelor of Science, Florida Institute of Technolog, 1988; Master of Science, *ibid.*, 1990 (1994)

**David M. Bartels.** *Professional Specialist, Radiation Laboratory; Concurrent Professional Specialist, Chemistry and Biochemistry.* Bachelor of Science, Hope College, 1977; Philosophiae Doctor, Northwestern University, 1982 (2003)

**Viva Ona Bartkus.** *Associate Professor, Management; Fellow, Kellogg Institute for International Studies.* Bachelor of Arts, Yale University, 1989; Master of Arts, *ibid.*, 1989; Master of Arts, University of Oxford, 1991; Philosophiae Doctor, *ibid.*, 1993 (2004)

## FACULTY

- Robert Henry Battalio.** *Professor, Finance.* Bachelor of Science, Texas A&M University, 1988; Philosophiae Doctor, Indiana Univ-Bloomington, 1995 (2000)
- Joseph P. Bauer.** *Professor, Law School.* Bachelor of Arts, Univ of Pennsylvania, 1965; Juris Doctor, Harvard University, 1969 (1973)
- Peter Heinz Bauer.** *Professor, Electrical Engineering.* Philosophiae Doctor, University of Miami, 1987 (1988)
- Barry William Baumbaugh.** *Professional Specialist, Physics.* Bachelor of Science, Indiana Institute of Technology, 1976 (1978)
- Laura A. Bayard.** *Librarian, Hesburgh Libraries.* Bachelor of Arts, Shippensburg University, 1969; Master of Science, University of Pittsburgh, 1974 (1989)
- Timothy James Bays.** *Associate Professor, Philosophy.* Bachelor of Arts, Northwestern University, 1988; Philosophiae Doctor, UCLA, 1994; Doctor of Philosophy, *ibid.*, 1999 (1999)
- Mary Louise Beard.** *Research Assistant Professor, Physics.* Bachelor of Science, University of Surrey, 2003; Master of Science, *ibid.*, 2003; , University of Notre Dame, 2010; , *ibid.*, 2010 (2010)
- Edward N. Beatty.** *Associate Professor, History; Fellow, Kellogg Institute for International Studies.* Bachelor of Arts, Princeton University, 1983; Master of Arts, University of New Mexico Main, 1992; Philosophiae Doctor, Stanford University, 1996 (2000)
- Emily Scott Beck.** *Assistant Professional Specialist, Art, Art History, and Design; Assistant Professor of the Practice.* 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; Fellow, Nanovic Institute for European Studies.* Bachelor of Arts, Univ of IL Urbana-Champaign, 1993; Master of Arts, Univ of Wisconsin-Madison, 1995; Philosophiae Doctor, *ibid.*, 2001 (2000)
- Mary Patricia Beckman.** *Professional Specialist, Center for Social Concerns; Associate Director for Academic Affairs and Research; Concurrent Professional Specialist, Economics and Policy Studies.* Bachelor of Arts, University of Notre Dame, 1975; Master of Arts, *ibid.*, 1984; Philosophiae Doctor, *ibid.*, 1986 (2001)
- Gail Bederman.** *Associate Professor, History; Concurrent Associate Professor, American Studies.* Bachelor of Arts, New York University, 1978; Master of Arts, Brown University, 1984; Philosophiae Doctor, *ibid.*, 1993 (1992)
- Susanta K. Behura.** *Research Assistant Professor, Biological Sciences.* Bachelor of Science, Utkal University, 1995; Master of Science, Guru Nanak Dev University, 1998; Philosophiae Doctor, Utkal University, 2000 (2008)
- Kimberly Hope Belcher.** *Assistant Professor, Theology.* Bachelor of Science, University of Florida, 2001; Master of Theological Studies, University of Notre Dame, 2003; Philosophiae Doctor, *ibid.*, 2009 (2013)
- Anthony Joseph Bellia.** *Professor, Law School; 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.** *Professor, Law School; Notre Dame Presidential Fellow.* Bachelor of Arts (Latin), Harvard University, 1991; Juris Doctor, Yale University, 1995 (2000)
- Gary E. Belovsky.** *Professor, Biological Sciences; Martin J. Gillen Director of the Environmental Research Center.* Bachelor of Business Admin., University of Notre Dame, 1972; Master of Science, Yale University, 1974; Philosophiae Doctor, Harvard University, 1977 (2001)
- Jada Perdita Benn Torres.** *Assistant Professor, Anthropology.* Bachelor of Arts, University of Notre Dame, 1999; Master of Science, University of New Mexico Main, 2001; Philosophiae Doctor, *ibid.*, 2006 (2008)
- David Paul Bennett.** *Research Professor, Physics.* Bachelor of Science, Case Western Reserve Univ., 1981; Master of Science, Stanford University, 1983; Philosophiae Doctor, *ibid.*, 1986 (1996)
- Gerald Steward Bennett.** *Assistant Professor, Naval Science.* Bachelor Degree - Unspecified, U. S. Naval Academy, 2006; Master Degree - Unspecified, Univ of Oklahoma-Norman, 2011 (2011)
- Mark Berends.** *Professor, Sociology.* Bachelor of Arts, Calvin College, 1985; Master of Science, Univ of Wisconsin-Madison, 1988; Philosophiae Doctor, *ibid.*, 1992 (2009)
- Georg Peter Berg.** *Research Professor, Physics.* Bachelor of Science, State University Groningen, 1968; Diploma, University of Cologne, 1972; Doctor of Science, *ibid.*, 1974 (2009)
- Cindy S. Bergeman.** *Professor, Psychology.* Bachelor of Science, University of Idaho, 1979; Master of Science, Pennsylvania State University, 1987; Philosophiae Doctor, *ibid.*, 1989 (1990)
- Jeffrey Harold Bergstrand.** *Professor, Finance; Fellow, Kellogg Institute for International Studies; Concurrent Professor, Department of Economics; Associate Dean, Mendoza College of Business.* Bachelor of Arts, Northwestern University, 1974; Master of Arts, Univ of Wisconsin-Madison, 1979; Philosophiae Doctor, *ibid.*, 1981 (1986)
- Tracy Catherine Bergstrom.** *Associate Librarian, Hesburgh Libraries; Director, Hesburgh Libraries.* Bachelor of Arts, Smith College, 1998; Master of Arts, Yale University, 2002; Master in Library Science, Southern Connecticut State Col, 2007 (2007)
- Melissa Berke.** *Assistant Professor, Civil Engineering and Geological Sciences.* Bachelor of Arts, Oberlin College, 2000; Master of Science, Univ of California Riverside, 2003; Philosophiae Doctor, University of Minnesota at Dul, 2011 (2013)
- Paola Bernardini.** *Assistant Professional Specialist, Joan B. Kroc Institute for International Peace.* Master of Education, Harvard University, 1999; Philosophiae Doctor, Universitate a St. Thomas Aquin, 2012 (2012)
- Robert James Bernhard.** *Vice President for Research, Office of VP Research; Professor, Aerospace and Mechanical Engineering.* Bach of Sci in Mech Engr, Iowa State University, 1976; M.S. Mechanical Engr, University of Maryland, 1976; Philosophiae Doctor, Iowa State University, 1982 (2007)
- Gary H. Bernstein.** *Frank Freimann Prof. in Engineering-II, Electrical Engineering; Professor, Electrical Engineering; Associate Chair, 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)
- Henry Gordon Berry.** *Professor, Physics.* Bachelor of Arts, University College Oxford, 1962; Master of Science, University of Wisconsin Center, 1963; Philosophiae Doctor, *ibid.*, 1967 (1994)
- Anne Hostetler Berry.** *Assistant Professional Specialist, Art, Art History, and Design; Assistant Professor of the Practice.* Master of Fine Arts, Kent State University, 2008; Bachelor of Arts, Goshen College, (2011)

## FACULTY

**Nora J. Besansky.** *Professor, Biological Sciences.* Bachelor of Science, Oberlin College, 1982; Master of Science, Yale University, 1987; Philosophiae Doctor, *ibid.*, 1990 (1997)

**Philip Hartzel Bess.** *Professor, School of Architecture.* Bachelor of Arts, Whittier College, 1973; Master of Theological Studies, Harvard University, 1976; Master of Architecture, University of Virginia, 1981 (2004)

**David M. Betson.** *Associate Professor, College of Arts and Letters.* Bachelor of Arts, Kalamazoo College, 1972; Master of Arts, Univ of Wisconsin-Madison, 1975; Philosophiae Doctor, *ibid.*, 1980 (1982)

**John Renner Betz.** *Associate Professor, Theology.* Bachelor of Arts, Wake Forest University, 1991; Philosophiae Doctor, University of Virginia, 1999 (2010)

**Mark C. Beudert.** *Professional Specialist, Music; Teaching Professor.* Bachelor of Arts, Columbia University, 1982; Master of Arts, University of Michigan, 1991; Doctor of Music, *ibid.*, 1995 (2007)

**Kraig Beyerlein.** *Assistant Professor, Sociology.* Bachelor of Arts, Concordia University, 1998; Master of Arts, UNC at Chapel Hill, 2002; Philosophiae Doctor, *ibid.*, 2006 (2009)

**Souvik Bhattacharjee.** *Research Assistant Professor, Biological Sciences.* Bachelor of Science, University of Delhi, 1995; Master of Science, Madurai Kamaraj University, 1997; Philosophiae Doctor, Inst. of Microbial Technology, 2003 (2008)

**Ikaros I. Bigi.** *The Grace-Rupley Chair in Physics; Professor, Physics.* Master of Science, Max-Planck-Gesellschaft, 1973; Philosophiae Doctor, *ibid.*, 1976 (1988)

**Zihni Basar Bilgicer.** *Assistant Professor, Chemical and Biomolecular Engineering.* Bachelor of Science, Bogazici Universitesi, 1998; Philosophiae Doctor, Tufts University, 2004 (2008)

**Alexander Blachly.** *Professor, Music.* Bachelor of Arts, Haverford College, 1967; Master of Arts, Columbia University, 1972; Philosophiae Doctor, *ibid.*, 1995 (1993)

**John Andrew Blacklow.** *Associate Professor, Music; Fellow, Nanovic Institute for European Studies.* Bachelor of Music, Harvard University, 1987; Master of Music, The Juilliard School, 1989; Doctor of Music, Univ of Southern California, 1996 (2002)

**Howard A. Blackstead.** *Professor, Physics.* Bachelor of Science, North Dakota State University, 1962; Master of Arts, Dartmouth College, 1964; Philosophiae Doctor, Rice University, 1967 (1969)

**Alessia Blad.** *Associate Professional Specialist, Romance Languages and Literatures.* Bachelor Degree - Unspecified, Indiana Univ South Bend, 2008; Master of Arts, University of Notre Dame, 2008 (2010)

**Patricia A. Blanchette.** *Professor, Philosophy.* Bachelor of Arts, Univ California San Diego, 1983; Philosophiae Doctor, Stanford University, 1990 (1993)

**Marina Blanton.** *Assistant Professor, Computer Science and Engineering.* Master of Science, Ohio University, 2004; Master of Science, Purdue University, 2005; Philosophiae Doctor, *ibid.*, 2007 (2007)

**Jaimie Bleck.** *Assistant Professor, Political Science; Concurrent Assistant Professor, African and African American Studies.* Bachelor of Arts, University of IL at Chicago, 2003; Master of Arts, Cornell University, 2008; Philosophiae Doctor, *ibid.*, 2011 (2011)

**Emily Sarah Block.** *Assistant Professor, Management.* Bachelor of Arts, University of Notre Dame, 1999; Philosophiae Doctor, Univ of IL Urbana-Champaign, 2009 (2008)

**Matt Bloom.** *Associate Professor, Management.* Bachelor of Science, Baker University, 1983; Master of Arts, University of Kansas, 1989; Philosophiae Doctor, Cornell University, 1996 (1996)

**W. Martin Bloomer.** *Professor, Classics; Director, PhD Literature.* Bachelor of Arts, Yale University, 1982; Master of Arts, *ibid.*, 1983; Master of Philosophy, *ibid.*, 1984; Philosophiae Doctor, *ibid.*, 1987 (1998)

**Susan D. Blum.** *Professor, Anthropology; Fellow, Kellogg Institute for International Studies.* Bachelor of Arts (Latin), Stanford University, 1980; Master of Arts, University of Michigan, 1986; Master of Arts, *ibid.*, 1988; Philosophiae Doctor, *ibid.*, 1994 (2000)

**Joseph Gerard Bock.** *Professional Specialist, College of Science; Teaching Professor.* Bachelor of Social Work, Univ of Missouri-Columbia, 1980; Master of Science, *ibid.*, 1981; Philosophiae Doctor, American University, 1985 (2007)

**Andriy Bodnaruk.** *Assistant Professor, Finance.* Bachelor of Science, Univ. of Kiev-Mohyla Academy, 1997; Master of Arts, *ibid.*, 1999; Philosophiae Doctor, Stockholm School of Economics, 2005 (2008)

**Tobias Boes.** *Associate Professor, German and Russian Languages and Literature.* Bachelor of Arts, Reed College, 1999; Master of Philosophy, Yale University, 2003; Philosophiae Doctor, *ibid.*, 2006 (2007)

**William Cecil Boggess.** *Professional Specialist, Chemistry and Biochemistry.* Bachelor of Science, Davis and Elkins College, 1988; Philosophiae Doctor, University Tennessee Knoxville, 1994 (1994)

**Paul William Bohn.** *Arthur J. Schmitt Chair, Chemical & Biomolecular Engineering; Professor, Chemical and Biomolecular Engineering; Joint Appointment, Chemistry and Biochemistry; Concurrent Professor, Chemistry and Biochemistry.* Bachelor of Science, University of Notre Dame, 1977; Philosophiae Doctor, Univ of Wisconsin-Madison, 1981 (2006)

**Catherine Elizabeth Bolten.** *Assistant Professor, Anthropology; Concurrent Assistant Professor, African and African American Studies; Fellow, Kellogg Institute for International Studies.* B.S. Biology, Williams College, 1998; Master of Science, University of Cambridge, 2000; Philosophiae Doctor, University of Michigan, 2008 (2009)

**Francesca Maria Bordogna.** *Associate Professor, Program of Liberal Studies; Concurrent Associate Professor, History.* Philosophiae Doctor, University of Chicago, 1998 (2011)

**Tatiana Botero.** *Associate Professional Specialist, Romance Languages and Literatures; Associate Teaching Professor.* Associate in Arts, Miami-Dade Community College, 1986; Bachelor of Arts, West Virginia University, 1996; Master of Arts Education, *ibid.*, 1997 (2011)

**Eileen Hunt Botting.** *Associate Professor, Political Science.* Bachelor of Arts, Bowdoin College, 1993; Bachelor of Arts, University of Cambridge, 1995; Master of Arts, Yale University, 1997; Master of Philosophy, *ibid.*, 1998; Philosophiae Doctor, *ibid.*, 2001 (2001)

**D'Arcy J. D. Boulton.** *Professional Specialist, Medieval Institute; Concurrent Professional Specialist, History; Professor of the Practice.* Bachelor of Arts, U of Trinity Coll Toronto, 1969; Master of Arts, Univ of Pennsylvania, 1970; Philosophiae Doctor, University of Oxford, 1976; Philosophiae Doctor, Univ of Pennsylvania, 1978 (1989)

## FACULTY

**Maureen B. M. Boulton.** *Professor, Romance Languages and Literatures.* Bachelor of Arts, College of New Rochelle, 1970; Master of Arts, Univ of Pennsylvania, 1972; Philosophiae Doctor, *ibid.*, 1976; Master of Literature, University of Oxford, 1980 (1985)

**Kevin W. Bowyer.** *Schubmehl-Prein Family Chair in Computer Science & Engineering; Professor, Computer Science and Engineering; Department Chair, Computer Science and Engineering; Concurrent Professor, Electrical Engineering.* B.S. Economics, George Mason University, 1976; Philosophiae Doctor, Duke University, 1980 (2001)

**Sunny K. Boyd.** *Professor, Biological Sciences.* Philosophiae Doctor, Oregon State University, 1987 (1987)

**Fernandre D. Boze.** *Associate Librarian, Hesburgh Libraries.* Bachelor of Arts, Univ of IL Urbana-Champaign, 1977; Master of Science, *ibid.*, 1989 (1991)

**Carol Ann Brach.** *Associate Librarian, Hesburgh Libraries.* Bachelor of Arts, Duquesne University, 1974; Master in Library Science, University of Pittsburgh, 1975 (1991)

**Tonya Patrice Williams Bradford.** *Assistant Professor, Marketing.* Bachelor of Arts, Northwestern University, 1986; Master of Arts, *ibid.*, 1991; Philosophiae Doctor, *ibid.*, 2007 (2007)

**Kevin Duane Bradford.** *Associate Professional Specialist, Marketing.* Bachelor of Arts, University of Northern Iowa, 1984; Master of Business Admin, University of Notre Dame, 1991; Philosophiae Doctor, University of Florida, 2000 (1999)

**Katherine A. Brading.** *Associate Professor, Philosophy; Director, History and Philosophy of Science.* Bachelor of Science, University of London, 1992; Bachelor of Philosophy, University of Oxford, 1996; Philosophiae Doctor, *ibid.*, 2001 (2004)

**Keith R. Bradley.** *The Eli J. Shabean Chair in Classics; Professor, Classics; Concurrent Professor, History.* Bachelor of Arts, University of Sheffield, 1967; Master of Arts, *ibid.*, 1968; Doctor of Fine Arts, University College Oxford, 1970; Philosophiae Doctor, University of Sheffield, 1980 (2001)

**Gerard Vincent Bradley.** *Professor, Law School.* Bachelor of Arts, Cornell University, 1976; Juris Doctor, *ibid.*, 1980 (1992)

**Douglas E. Bradley.** *Concurrent Professional Specialist, Anthropology; Professional Specialist, Snite Museum.* Bachelor of Arts, University of Notre Dame, 1971; Master of Arts, University of Michigan, 1976 (1979)

**Steven James Brady.** *Fellow, Nanovic Institute for European Studies; Associate Professional Specialist, First Year of Studies; Concurrent Associate Professional Specialist, History.* Bachelor of Arts, Roosevelt University, 1989; Master of Arts, University of Notre Dame, 1992; Philosophiae Doctor, *ibid.*, 1998 (1998)

**Jay William Brandenberger.** *Professional Specialist, Center for Social Concerns; Concurrent Professional Specialist, Psychology; Fellow, Institute for Educational Initiatives.* Bachelor of Arts, University of Notre Dame, 1978; Master of Arts, University of Pittsburgh, 1987; Philosophiae Doctor, *ibid.*, 1990 (1991)

**Robert Joseph Brandt.** *Professional Specialist, School of Architecture.* Bachelor of Science, University of Southern Indiana, 1986; Master of Fine Arts, Indiana State University Main, 1989 (1992)

**Julia Margaret Braungart-Rieker.** *Professor, Psychology.* Bachelor of Science, Syracuse University, 1987; Master of Science, Pennsylvania State University, 1990; Philosophiae Doctor, *ibid.*, 1992 (1992)

**Joan Frances Brennecke.** *The Bernard Keating-Crawford Chair in Engineering; Professor, Chemical and Biomolecular Engineering.* Philosophiae Doctor, Univ of IL Urbana-Champaign, 1989 (1989)

**Sarah Ellen Brenner.** *Associate Professional Specialist, First Year of Studies.* Bachelor of Arts, University of Notre Dame, 1998; Master of Arts, Ohio State University, 2003; M.S. Social Work, *ibid.*, 2003 (1995)

**Paul Raymond Brenner.** *Research Assistant Professor, Computer Science and Engineering.* Bachelor of Science, University of Notre Dame, 1998; Master of Science, Ohio State University, 2000; Philosophiae Doctor, University of Notre Dame, 2007 (2007)

**Robert D. Bretz.** *The Joe and Jane Giovanini Chair in Management; Professor, Management.* Bachelor of Arts, Bethany College, 1980; Master of Business Admin, University of Kansas, 1984; Philosophiae Doctor, *ibid.*, 1988 (1997)

**Margaret Brinig.** *Fritz Duda Family Chair in Law; Professor, Law School.* Juris Doctor, Seton Hall University, 1970; B.A. History, Duke University, 1970; Master of Arts (Latin), George Mason University, 1993 (2006)

**Jay Barrett Brockman.** *Associate Dean, Computer Science and Engineering; Associate Professor, Computer Science and Engineering; Concurrent Associate Professor, Electrical Engineering.* Bachelor of Science, Brown University, 1982; Master of Engineering, Carnegie Mellon University, 1988; Philosophiae Doctor, *ibid.*, 1992 (1992)

**James Robert Brockmole.** *Associate Professor, Psychology; Acting Associate Dean, Office of Arts and Letters Undergraduate Study.* Bachelor of Arts, University of Notre Dame, 1999; Master of Arts, Univ of IL Urbana-Champaign, 2001; Philosophiae Doctor, *ibid.*, 2003 (2009)

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