



First Year
of
Studies

The First Year of Studies

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All students admitted to Notre Dame as undergraduate first-year students enter the First Year of Studies. The responsibilities of the First Year of Studies are to arrange the academic programs for the first-year students and to provide the guidance needed as they adjust to their new environment and meet the challenges of the Notre Dame Academic Program.

The academic program for each first-year student is constructed around a framework called the First-Year Curriculum. The First-Year Curriculum includes five courses plus physical education or ROTC each semester. Seven of the 10 courses are in specified areas and three are electives. This arrangement provides 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 major.

At Notre Dame, no first-year student is in a major. In the First-Year Curriculum, all students are given the opportunity to sample areas before they are required to declare a commitment to any one of them.

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 opportunity to explore areas of interest open to them.

The First Year of Studies advisors provide information regarding the First-Year Curriculum and its relation to further education and life goals. Also, the advisors assist the first-year students as they plan their first year at Notre Dame and then the transition into the sophomore year.

Upon successful completion of the First-Year Curriculum, Notre Dame students advance from the First Year of Studies to one of four undergraduate colleges: Arts and Letters, Business, Engineering or Science, or the School of Architecture.

First-Year Curriculum

The First-Year Curriculum consists of five courses plus physical education or ROTC each semester. The five courses are arranged as follows:

Course 1

1 semester of a University Seminar
and

1 semester of Composition

Course 2

2 semester courses in mathematics

Course 3

2 semester courses in a natural science

Course 4

1 semester course of an Arts and Letters

University requirement chosen from:

history, social science, philosophy,

theology or fine arts *and*

1 semester elective course

Course 5

2 semester courses of University or program requirements

Entering students are expected to take the entire First-Year Curriculum of five courses per semester, along with the laboratories and tutorials that accompany those courses, plus physical education or ROTC. It is possible to take an activity or experiential learning one-credit course, such as chapel choir, chorale, chorus, glee club, marching band, orchestra and other music ensembles. The colleges will have restrictions on how many one-credit voluntary courses may be applied to the total number of credits required for graduation from the colleges.

Certain courses and course areas in the First-Year Curriculum are included among the University requirements for all undergraduate students at Notre Dame. These courses and course areas are: a University Seminar; Composition; two semester courses in mathematics; two semester courses in a natural science; one semester course chosen from history, social science, philosophy, theology, fine arts; and two semester courses in physical education or in ROTC. Foreign language is not a University requirement, but it is required in the programs of the College of Arts and Letters and the College of Science.

In addition to these courses and course areas, the First-Year Curriculum includes three semester elective courses which may be used to sample particular areas of focused education or to further general education. To aid in the sampling, we recommend specific courses as the best preparation for certain of the college programs. General recommendations concerning each of the courses in the First-Year Curriculum are given in the following pages, along with descriptions of the courses named. In addition, complete instructions for making course selections and detailed course descriptions are included in the *First Year Academic Guide*, which is mailed to all incoming freshmen during the month of June.



Eileen Kolman, dean of the First Year of Studies and concurrent assistant professor of mathematics

Course 1— A University Seminar/ Composition

A University Seminar and Composition are companion courses that all Notre Dame undergraduate first-year students take as University requirement courses. Both courses, a University Seminar and FYC 110, must be taken, one in each semester.

COURSE DESCRIPTIONS

A UNIVERSITY SEMINAR

University seminars are designed to foster intense interaction between first-year students and faculty in small settings. These courses, designated by the "180" number, are offered by every department (except computer applications) within the College of Arts and Letters and will satisfy the relevant University requirement in history, literature, fine arts, and social science, as well as 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. Each first-year student will be required to complete one University seminar.

FYC 110. First-Year Composition

First-Year Composition is designed to help students learn how to craft an argument based on different sources of information. Three different essays are required that develop specific skills by creating university-level conversations about a public issue. The first essay is an argument in conversation with the student's experience, the second is a researched essay in conversation with scholarship, and the third is an independent research project the student will craft.

The third essay requires the student to take on the voice of the researcher by constructing his or her own research project and interpreting the results in the context of a university-level argument. To enhance the third component of this course, there are eight sections of Composition 110 that involve a community-based learning component. In cooperation with the Center for Social Concerns, these sections place the students in learning situations in the wider community, where they will be in contact with people who are dealing with the specific content issue of their section. Students are expected to create a conversation between scholarship in that field, their community-based learning experience and the common conversation in the classroom. The content of these sections varies; there are several issues addressed that provide the common conversation for the course. For example: literacy in the community, education of the disadvantaged, Catholic/Christian identity in education, and similar topics.

The following prepare the student to read and write in the University: (1) identifying an issue amid different and conflicting points of view in the readings; (2) framing and sustaining an argument that not only includes both the analysis and exposition of information but also establishes what is at stake in the argument; (3) providing relevant advice to support a given point of view; (4) identifying and analyzing potential counterarguments; (5) developing skills for writing a University-level research proposal, for conducting original research, and for using print and electronic resources from the library.

First-Year Composition aims at developing the following critical reading skills that are complementary with the writing skills above: the ability to (1) identify a writer's line of argument (2) evaluate a writer's claim in light of the evidence the writer provides, (3) identify underlying assumptions as well as what a writer leaves unsaid, and (4) evaluate the implications of an argument.

FYC 115. Advanced First-Year Composition

Advanced First-Year Composition (115) is a writing workshop designed for students who have Advanced Placement credit for FYC 110 but who seek opportunities to enhance their academic writing skills.

Course 2—Mathematics

All Notre Dame first-year students must take two semesters of mathematics as a University requirement. Note the special sequencing of the two semesters of mathematics. Students who have credit for the first level of calculus (whether MATH 105, 119, 125, or 165) will not fulfill the University requirement unless they take a second level of calculus (MATH 108, 110, 120, 126, 166) or MATH 104, or courses chosen from grouping MATH 112–118.

Students in the College of Arts and Letters may fulfill their mathematics requirement by taking any of the calculus sequences required of students in other colleges or the School of Architecture. The only exceptions are for the arts and letters preprofessional (premedical) and math major programs (as noted below under MATH 119–120 and MATH 165–166). Additionally, there are other mathematics courses specially designed for students in this college. These include Finite Mathematics (MATH 104) and courses chosen from the grouping MATH 111–118. (Note: The course MATH 103 fulfills only a University natural science requirement and not a University mathematics requirement.)

For students in the Mendoza College of Business, the required calculus sequence is MATH 105, 108. Also acceptable are the calculus sequences required of students in the College of Engineering or the College of Science.

Students in the School of Architecture take MATH 105, 110. Also acceptable are the calculus sequences MATH 105, 108; or 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 119–120, MATH 125–126, MATH 165–166 or MATH 195–196. The sequences MATH 119–120 and MATH 195–196 are acceptable for students in certain programs emphasizing the life sciences, such as biological sciences, or the preprofessional programs in either the College of Science or the College of Arts and Letters. For students in the College of Engineering, the mathematics requirement is fulfilled through the calculus sequence MATH 125–126 or MATH 165–166.

The sequence MATH 165–166, which is a more rigorous course, is designed especially for students who plan to enter either the Honors Mathematics sequence in the College of Science or the Mathematics Major in the College of Arts and Letters. It is also open to other students with strong high school mathematics backgrounds who desire a greater intellectual challenge and a deeper insight into the calculus than is offered by the other calculus sequences. The course stresses concepts and proofs.

A student who completes the MATH 105, 108 or 105, 110 sequences and then decides to enter a science or engineering program will have to take additional courses in mathematics, as prescribed by the administrator of the program.

Students planning to major in biochemistry must take MATH 125–126. Students planning to enter other science programs that require only two semesters of calculus also may use MATH 119–120 to satisfy the requirement, but they should be aware that it is not a suitable prerequisite for the sophomore sequence MATH 225, 228, or 225, 230 required by many of the College of Science programs.



COURSE DESCRIPTIONS

MATH 104. Finite Mathematics

(3-0-3)

For students in the College of Arts and Letters.

Credit is not given for both MATH 104 and MATH 107. This course is recommended particularly to students with interests in the social sciences.

Elements of probability, statistics and matrix theory with applications including Markov chains, game theory and the mathematics of finance.

MATH 105. Elements of Calculus I

(3-0-3)

For students in the College of Arts and Letters, the Mendoza College of Business or the School of Architecture.

A study of differential and integral calculus as part of a liberal education. Topics include functions and their graphs, derivatives, integrals and applications.

MATH 107. Principles of Finite Mathematics

(3-0-4)

For students in Arts and Letters. Credit is not given for both MATH 107 and MATH 104. For first-year students who lack the necessary background for MATH 104.

Topics include elementary probability, data analysis, statistical inference and information codes.

MATH 108. Elements of Calculus II for Business

(3-0-3)

Prerequisite: MATH 105 or equivalent. Credit is not given for both MATH 108 and either MATH 110 or MATH 120. For first-year students intending to major in the Mendoza College of Business. It is also acceptable for students intending to major in the College of Arts and Letters.

An introduction to the basic concepts of calculus, with the emphasis on problems arising in business and economics.

MATH 110. Elements of Calculus II in Basic Sciences

(3-0-3)

Prerequisite: MATH 105 or equivalent. Credit is not given for both MATH 110 and either MATH 108 or MATH 120. For students intending to major in the College of Arts and Letters or the School of Architecture.

An introduction to some basic applications of elementary calculus, especially those arising in the basic sciences. Topics will include the suspension bridge, nuclear clocks and population growth. Each topic will be preceded by a review of the required elements of mathematics and science.

MATH 111. Principles of Calculus

(3-0-4)

For students in the College of Arts and Letters.

Credit is not given for this course and any other calculus course.

A terminal course introducing the principles of calculus. Topics include basic properties of functions, derivatives and integrals. This course is not intended to prepare students for more advanced work in calculus.

MATH 112. Beginning Logic

(3-0-3)

For students in the College of Arts and Letters.

An introduction to formal languages, systems of proof, and symbolic logic.

MATH 114. Elements of Statistics

For students in arts and letters, architecture, or as an elective for students in business administration.

A non-calculus introduction to statistics. Topics include hypothesis testing, sampling, experiment design, continuous density functions, least square regression lines, covariance, as well as elementary probability theory.

MATH 119–120. Calculus A and B

(3-1-4) (3-1-4)

Primarily for students in science whose programs require a one-year terminal course in calculus of one variable. The course is also open to students in the College of Arts and Letters or the Mendoza College of Business who desire a more thorough exposure to calculus than is offered in MATH 105–108/110.

Topics include sets, functions, limits, continuity, derivatives, integrals and applications.

MATH 125–126. Calculus I and II

(3-1-4) (3-1-4)

For students in the College of Science and the College of Engineering.

A comprehensive treatment of calculus of one variable. Topics include sets, functions, limits, continuity, derivatives, integrals and applications. Also covered are transcendental functions and their inverses, infinite sequences and series, parameterized curves in the plane and polar coordinates.

MATH 165–166. Honors Calculus I and II

(4-0-4) (4-0-4)

Required for honors mathematics majors.

A rigorous course in differential and integral calculus of one variable. Topics include an axiomatic formulation of the real numbers, mathematical induction, infima and suprema, functions, continuity, derivatives, integrals, infinite sequences and series transcendental functions and their inverses and applications. The course stresses careful mathematical definitions and emphasizes the proofs of the standard theorems of the subject.

Course 3— Natural Science

First-year students usually take two semesters of a natural science as Course 3 in the First-Year Curriculum.

While determining which course you will take as Course 3, you should consider the following:

1. All Notre Dame students must, as a University requirement, take two semesters of a natural science before completion of their sophomore year. However, it is recommended that the natural science requirement be met in the first year. Students planning to participate in an international study program during their sophomore year must complete the natural science requirement in the first year, along with the required language for international study (see Course 5).

2. Students contemplating any of the College of Engineering or College of Science programs or preprofessional studies (premedical and other health-related fields) in the College of Arts and Letters take the natural science requirement in their first year. The natural science is often a prerequisite for other courses in these programs. Students thinking of entering any of the following programs in the College of Science are advised to take CHEM 113–114 or CHEM 117–118 as their natural science requirement in the first year: chemistry, biochemistry, environmental sciences, science preprofessional, science collegiate sequences, biological sciences, mathematics and physics. A second science course is required and discussed under Course 5 for students interested in chemistry, biochemistry, biological sciences, mathematics, and physics. Students planning to enter the College of Arts and Letters Preprofessional Program will also take CHEM 113–114 or CHEM 117–118 in their first year.

3. Students planning on an engineering program are required to take CHEM 113–114 or CHEM 121–122 as the sequence to satisfy the requirement. The correct option is determined by criteria described in the *First Year of Studies Academic Guide*.

4. Prospective arts and letters or business students interested in the environmental sciences second major offered by the College of Science should take CHEM 113–114 or CHEM 117–118 as their natural science requirement.

5. Students planning to enter the Mendoza College of Business programs or the College of Arts and Letters programs other than mathematics or preprofessional studies may select freely from among any of the natural science courses offered and for which they are prepared. However, the following courses are specially designed for the students planning to enter these programs: BIOS 101 through 117; CHEM 101 through 104; MATH 103; PHYS 101, 102, 110, 115, 116, 171, 174; SCPP 101.

6. First-year students may substitute two semesters of a foreign language in place of two semesters of science to complete first-year course requirements. (Refer to Course 5 for information on foreign language.)

COURSE DESCRIPTIONS

Series I—Laboratory Sciences

The courses offered by the College of Science for first-year students are broadly grouped into two main categories. The first series of courses, Laboratory Sciences, are listed below. They 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.

BIOS 155–156, 155–156L. Biological Sciences I and II

Prerequisites: High school biology and chemistry. BIOS 155 is a prerequisite for BIOS 156.

Corequisite: CHEM 113–114/CHEM 117–118. Restricted to biological science and biochemistry intents/majors.

This is a two-semester course with three lectures and one three-hour laboratory a week (four credit hours per semester) for first-year students contemplating a career in biology, biochemistry or related areas. This sequence is designed to properly prepare students for more advanced biology courses to be taken in subsequent years. It is, therefore, not a typical survey course but rather a course which will emphasize and develop biological concepts in selected areas utilizing an experimental approach to the subject matter.

The topics presented in the first semester in the context of modern evolutionary theory include biological diversity, ecology and organismic physiology. The second semester follows with a description of biologically important molecules and then proceeds to cell structure, energy metabolism and classical and modern genetics.

The laboratory sessions are an integral part of this course, which will complement the lectures. In addition, students learn to present their findings as they would for a journal article or a scientific meeting (seminar and poster presentations). The lab sessions will offer the student direct experience in using the scientific method and simultaneously provide an introduction to numerous biological analytical techniques.

CHEM 113–114. General Chemistry I-T and II-T

Prerequisites: High school chemistry and physics and three-and-one-half units of mathematics.

This course offers students within any degree program a full year of lecture and laboratory work, supplemented by weekly tutorial sections (four credit hours per semester). The general topics, textbook and laboratory are the same as those for CHEM 117–118.



Introduction to the principles and concepts of chemistry and its application in the world. Topics include periodic properties of the elements, reaction stoichiometry, atomic theory, molecular structure and bonding, acids and bases, reduction-oxidation reactions, gas-laws, thermochemistry, equilibrium and chemical kinetics. Lectures, demonstrations, laboratory experiments and tutorial sections are integrated to promote a deeper understanding of chemistry fundamentals and to develop the analytical skills necessary for solving problems.

CHEM 113–114 is designed to help students gain a deeper understanding of chemistry fundamentals while developing the analytical skills necessary for solving problems. In the weekly tutorials, students will work in small groups at solving problems collaboratively; students will actively learn how to apply and integrate chemistry concepts from the lecture, laboratory and text. The extra guidance and interaction offered in tutorial sections can help students discover new and effective ways to analyze and work through problems.

CHEM 114 will serve as a prerequisite course to all upper-level courses which list CHEM 118 as a prerequisite.

CHEM 117–118. General Chemistry I and II

Prerequisites: High school chemistry and physics, and three-and-one-half units of mathematics.

This is intended as the primary course for science students. It includes a full year of both lecture and laboratory work (four credit hours per semester). This lecture course covers classical/modern chemistry, with applications, in the approximate order: stoichiometry and classical atomic theory of chemistry; periodic properties; gas laws; chemical equilibrium; solution chemistry (acids and bases, solubility, physical properties of solution); thermochemistry; chemical kinetics; modern quantum theory of atomic and molecular structure and periodic properties.

Descriptive chemistry is included throughout in all developments. Frequent live demonstrations and classroom computer use emphasize the unifying experimental and theoretical aspects of the subject.

The lab introduces experimental chemistry with examples from all areas of chemistry. The experiments range from traditional wet chemistry to modern instrumental analysis. The lab consists of pre-lab lecture and individual laboratory work. Computers are integrated into experiments to promote problem-solving skills and provide experimental simulation.

CHEM 121–122. General Chemistry Fundamentals and Biological Processes

Prerequisites: high school chemistry and physics, three-and-one-half-units of mathematics.

Designed for first-year students intending to major in engineering. In the first semester, the fundamental principles of chemistry are presented including atomic and molecular structure, molecular properties, periodic trends in reactivity, solution chemistry, thermodynamics and kinetics. Quantitative aspects are stressed. A laboratory is offered with part of this course. In the second semester, these topics are woven into key themes of modern biology, including protein structure and function, gene structure and manipulation, and basics of biotechnology. Emphasis is placed in common themes rather than biological systems of interest to engineers.

The course will serve as a prerequisite course to all upper-level courses that list CHEM 118 or CHEM 126 as a prerequisite.

CHEM 125–126. General Chemistry I-M and II-M

Prerequisites: High school chemistry and physics; three-and-one-half units of mathematics.

Corequisites: MATH 125–126.

A course in modern chemistry recommended for students with a special interest in the subject, especially those intending to major or wishing to explore a major in chemistry or biochemistry. A thorough and rigorous study that provides a background for further study in chemistry for students of science or engineering. This four-credit-hour course integrates the class and laboratory work closely, seeking to emphasize the unifying experimental and theoretical aspects of the subject. Contemporary studies provide a basis for a critical understanding of the evolving nature of this science and of its importance in the modern world. Students will work extensively with class and laboratory materials developed especially for this course.

ENVG 131. Physical Geology

Prerequisite: Open to engineering and science common core intents.

An introduction to the Earth: its processes, composition, evolution, and structure. The course introduces student to mineralogy, petrology, structural geology, oceanography, surficial processes, and environmental geology. Lecture and laboratory meetings.

PHYS 131–132. General Physics I-M and II-M

Prerequisites for PHYS 131: High school chemistry and physics and three-and-one-half units of mathematics.

Corequisite for PHYS 131: MATH 125 or equivalent.

Prerequisites for PHYS 132: PHYS 131 or 151, and MATH 125.

Corequisite for PHYS 132: MATH 126 or equivalent.

A two-semester sequence in general physics. Topics include the kinematics and mechanics of a particle; work, energy and momentum, and associated conservation laws; rotation, torque and angular

momentum; oscillations and wave motions; electrostatics, electric current and circuits; magnetism, electromagnetic induction and waves; geometrical optics. A course designed for students of science and engineering. Laboratory meetings in alternating weeks only. Weekly tutorial sessions.

PHYS 151–152. General Physics I-M and II-M

Prerequisites for PHYS 151: High school chemistry and physics, and three-and-one-half units of mathematics.

Corequisite for PHYS 151: MATH 125 or equivalent.

Prerequisites for PHYS 152: PHYS 151 or 131, and MATH 125.

Corequisite for PHYS 152: MATH 126 or equivalent.

The first two semesters of a three-semester sequence in general physics. Topics include the kinematics and mechanics of a particle; work, energy and momentum, and associated conservation laws; rotation, torque and angular momentum; oscillations and wave motions; electrostatics, electric current and circuits; magnetism, electromagnetic induction and waves; geometrical optics. A course designed for students intending to enter the Department of Physics. Laboratory meetings each week.

**Series II—Topical Sciences**

The second series of courses, Series II, Topical Sciences, is designed for those first-year students who are planning eventually to enter the College of Arts and Letters, the Mendoza College of Business or the School of Architecture. These courses differ from the courses noted above chiefly in that they are somewhat interdisciplinary in nature and/or that they focus on themes which may have, in part, an ethical or value-related dimension. It should be emphasized that these courses are often just as rigorous and intellectually demanding as the laboratory courses offered by the college.

BIOS 101. Human Genetics, Evolution, and Society

Prerequisite: One year of high school biology and chemistry.

The Human Genetics, Evolution, and Society course sequence is designed to provide a “working” overview of the field—freely drawing upon actual case studies to illuminate the exciting interrelationships, challenges and even tensions, in this most rapidly developing branch of science. The primary goal of the course will be the demonstration of what science really is and how scientists go about their work utilizing human genetics as our model. This course addresses fundamental biological principles using the two cornerstones of modern biology—genetics and evolution. Topics considered include cell theory, reproduction and development, birth defects, sexual development, gender assignment, cancer genetics, and the genetic basis of intelligence and skin color. Aspects of genetic engineering research includes stem cell studies and their societal implications will be presented and considered. The format of the course includes two formal lecture presentations and one small interactive discussion session each week.

BIOS 106. Common Human Diseases

Prerequisites: One year of high school biology; one year of high school chemistry.

The goal of this course is to introduce students to diseases that may afflict them, their parents and/or their children, as well as other health problems common to the tropics. It will provide the student with the information necessary to understand the biology of the disease process.

BIOS 107. Environment and Evolution

Emphasis will be placed on today’s ecological and environmental problems and the possible effect they may have upon the future evolution of life on Earth. Topics will generally include an overview of the theory of evolution and a discussion of ecological principles as observed at the population, community and ecosystem levels. The influence of cultural and political factors will also be discussed. Each academic year, one or more more sections will be offered; some may be individually subtitled, allowing for a one-time presentation of specific topics within the context of “environment and evolution” in addition to multiple-semester presentations of a specific topic (e.g., evolutionary ecology, ecology and environmental issues, freshwater and society, environmental issues and solutions).

BIOS 108. Revolution in Biology

The goal of this course is to teach six basic tenets of biology, the historical context for each discovery, the scientific and technical advances made and their ethical implications. The topics will include genetics and evolution: cell biology and biochemistry; the germ theory; and ecology. A term paper is required. BIOS 108 is generally offered only in the summer session.

BIOS 109. Human Reproduction and Society

This introductory course is offered to non-science majors. Basic aspects of human development and reproduction will be covered, from conception through sexual senescence. In addition, the science behind currently debated social issues will be discussed. Possible topics are causes and treatment of infertility, *in vitro* fertilization, control of male and female fertility, pregnancy and paternity testing, prenatal genetic testing, gene therapy, the effects of legal and illegal drug use on reproductive function and embryonic/fetal development, and the impact of current health care reform legislation on prenatal care.

BIOS 110. Genetics, Technology, and Society

The objectives of this course are to give students an overview of human genetics and an appreciation for the relatively new field of molecular biology that is currently being used to study human genetic diseases. Genetic technologies such as cloning and manipulating genes, genetic biotechnology, gene therapy, DNA testing, and so forth will be emphasized. The ethical, social, and legal implications of these technologies will also be covered. In addition, this course will address the role of genetics in human cancer, behavior, obesity, intelligence, and sexual orientation.

BIOS 116. Biology and Nutrition

Prerequisite: One year of high school biology and chemistry.

This course, designed for non-science majors, will provide a general overview of the field of nutrition. The course will be in a lecture format, with online and other computer activities along with hour exams and a final exam. Topics to be presented include an introduction to the field of nutrition, nutrient composition of foods, recommended intakes and health claims, a review of the nutrients (i.e., carbohydrates, lipids, proteins, vitamins, and minerals), food intake and energy balance, sports nutrition, eating disorders, current issues of food safety, fads, and other aspects of nutrition encompassing nutrition during all stages of life.

BIOS 117: Biodiversity: Its Challenge and Future

Prerequisite: One year of high school biology and chemistry.

Today, species of plants and animals are going extinct at an unprecedented rate in the 3.5 billion-year history of life on Earth. Not only are species going extinct, but complete assemblages of species in particular habitats are threatened as well. The class will survey the reasons why this disappearance of species and habitats concerns biologists, the basic concepts that biologists hope to employ to help prevent the continuance of this trend, and the problems faced

in formulating policies that address this problem.

This human problem is important locally and globally, since legislation attempting to halt the loss of biological diversity will affect the actions of people at the community, state, national and international levels. To the majority of people in the USA and other developed countries concern for biodiversity is second only to their economic well-being.

CHEM 101. Foundations of Chemistry

Not open to students who have taken CHEM 103, 115 or 117.

This course covers forms, properties, and separation of matter, atomic structure and periodicity, nuclear chemistry, chemical bonding and structure, reactivity with applications to acid-base and oxidation-reduction reactions, chemistry of carbon and living systems.

CHEM 102. Chemistry, Environment and Energy

Prerequisite: CHEM 101 or permission of the instructor. Not open to students who have taken CHEM 116 or 118.

Chemistry of the atmosphere, hydrosphere and lithosphere, agricultural chemistry and pesticides, food and drugs, hazardous and solid wastes, recycling. Fossil fuels, and nuclear, solar, geothermal and other types of energy.

MATH 103. Processes of Mathematical Thought

For students in the College of Arts and Letters or the Mendoza College of Business.

A study of mathematical thought as an analytical tool to solve real-life problems. The class is divided into teams, each analyzing a topic from such areas as commercial games, consensus within diversity, governmental economic planning and chaos theory. Teams will present their findings in a seminar format. This course satisfies one semester of the University science requirement but does not count toward the University mathematics requirement.

PHYS 101–102. Concepts of Physics I and II

This course is intended for students who will not be majoring in science or in engineering. A study of the major concepts and laws of classical and modern physics, in some historical context, provides the student with a foundation for understanding, at a conceptual level, natural phenomena and technological devices encountered in everyday experience. PHYS 101 will include a study of motion and Newton's laws, momentum and energy, the structure of matter, thermodynamics and relativity (taught in fall semester). PHYS 102 will cover wave motion, electromagnetism, light, and the quantum nature of the atomic and subatomic world (taught in fall semester). PHYS 101 is *not* a prerequisite for PHYS 102. This course fulfills the University science requirement.

PHYS 105. Science Literacy

This course is intended to provide you the tools needed for a basic understanding of scientific developments, and how they affect your life. Consider the laser; you find it in everywhere, from defense and medicine to printing and music. Is laser light different from "ordinary" light? Could its applications, such as those just mentioned, have been foreseen when the laser was first invented? Part of the increasing importance of science is because of the role which it plays in communications and information processing. But did you know that this role largely evolves around the discovery of a single defect in a crystal? We will discuss the staggering pace of developments in biology, chemistry, physics, mathematics, engineering and computer sciences and how they come together.

PHYS 110. Descriptive Astronomy

Prerequisites: Three units of high school algebra and geometry. One unit of high school science.

A description of the motions and structures of the earth, moon and planets. An exposition of the modern theories of solar and stellar structure, nebulae and galaxies. Basics of stellar evolution, black holes, quasars and other recent developments. An introduction to cosmology. This course includes elementary observational projects. The course is open to all students. It fulfills one semester of the University science requirement.

PHYS 115–116. Principles of Physics I and II

Prerequisites: A knowledge of algebra and trigonometry and the ability to use them in solving problems. High school chemistry is recommended. PHYS 115 is a prerequisite to PHYS 116.

A course intended for students who desire a grounding in all the major principles of physics but who plan to major in some area other than science or engineering. The ability to apply these principles to the solution of problems is a major goal of the course. The following topics are normally included: Kinematics and dynamics of a particle, equilibrium of forces and torques, work, energy, momentum, collisions, harmonic motion, gravitation and circular orbits; wave motion, interference, standing waves, the Doppler effect; temperature, heat, first law of thermodynamics, kinetic theory of gases; electric charge, Coulomb's law, electric field and potential, current, resistance, DC circuits; magnetic force, electromagnetic induction; the nature of light, the spectrum; photons, photoelectric effect, Compton scattering, deBroglie waves, energy levels, X-rays; nuclei and radioactivity; special relativity. Additional material will be at the discretion of the instructor. The division between PHYS 115 and 116 will depend on the order of presentation. This course fulfills the University science requirement.



First Year of Studies faculty/staff. Seated: Elaine Tracy, Eileen Kolman, Louise Litzinger, Angie Chamblee, Rita Grontkowski, Laura Flynn, Andrea Bueno, Holly Martin. Standing: Nahid Erfan, Anita Stratton, Kenneth DeBoer, Melvin Tardy, Raymond Sepeta, Steven Brady, Sandra Harmatiuk, Kevin Rooney, Karmen Duke, Timothy McNeill, Barbara Whalen. Not pictured: Jaleh Dashti-Gibson, Christy Fleming.

PHYS 171. Elementary Cosmology

Prerequisites: High school physics, algebra and trigonometry.

An elective course for students planning to major in the College of Arts and Letters or the Mendoza College of Business. It is designed to acquaint students not mathematically inclined with the most important discoveries in physics of the last few decades and how they have altered our perceptions of the origin and structure of the universe. The course examines such questions as "Where did the universe come from?" "Why do scientists feel sure that it was born in a cosmic fireball called the Big Bang?" and "Where did the Big Bang itself come from?"

This is a reading-intensive course based on popularizations of science written for the curious and intelligent lay person. The emphasis is on class discussion of the readings. This course satisfies one semester of the University science requirement.

PHYS 174. Physics of Music and Sound Reproduction

Prerequisites: High school algebra, geometry and trigonometry.

The physics of sound reproduction, including the acoustical and electronic production and reproduction of sound. The course will include basic Newtonian mechanics, oscillating systems, wave

motion, sound, Fourier synthesis, musical acoustics including detailed descriptions of various acoustical instruments, introduction to electricity and magnetism and the physics of microphones, loudspeakers, phonographs, tape recording, digital compact discs and electronic synthesizers. This course satisfies one semester of the University science requirement.

PHYS 178. Physical Methods in Art and Archaeology

Prerequisite: High school physics and algebra.

A course that gives an overview of the various physics-based analysis and dating techniques used in art and archaeology. The course will cover topics such as X-ray fluorescence and X-ray absorption, proton-induced X-ray emission, neutron-induced activation analysis, radiocarbon dating, accelerator mass spectroscopy, luminescence dating, and methods of archeometry. Multiple examples of the use of the techniques in art and archaeology will be given, e.g., under X-ray techniques and accelerator mass spectrometry, the analysis of ancient coins and violin varnish and the Iceman and the Turin Shroud are used respectively as examples. Physics principles of the methods and techniques will be taught in a descriptive manner. This course is intended for students in arts and letters or business and satisfies one semester of the University science requirement. If taken by science or engineering students, this course counts as general elective credit.

SCPP 101. Medical Science from Birth to Death

First-year students only.

The course will cover the science behind the technological advances used in various medical specialties that raise ethical questions from the beginning to the end of life. It will provide students with an overview of the biotechnological advances that are in the news, reshaping the scientific culture of modern medicine and challenging personal and societal human values. This course fulfills one semester of the University science requirement.

Course 4— History, Philosophy, Social Science, Theology, or Fine Arts/Elective

Every Notre Dame first-year student must take at least one semester of either history, philosophy, social science, theology, or fine arts/literature as a University requirement during their first year of studies.

The courses available in the First-Year Curriculum for satisfying this requirement are listed below. Limited spaces in fine arts courses are available to first-year students. The literature requirement typically is satisfied after the first year or by taking a literature University Seminar in the first year.

COURSE DESCRIPTIONS FOR HISTORY, PHILOSOPHY, SOCIAL SCIENCE, THEOLOGY, AND FINE ARTS

ANTH 109. Introduction to Anthropology

This lecture course, designed specifically for first-year students, is an introduction to one of the most exciting of the social sciences. Anthropology helps answer some of the most basic questions about ourselves and others: How and why did humans evolve? How did the human culture develop and why the many differences? How does human language work and in what ways does it affect our ability to perceive the “real” world? Why are there so many different cultures? Are human behavior and human nature best explained by reference to genes, adaptation to environment or the symbolic nature of culture itself? Exploring these questions offers students a fascinating opportunity to learn more about other cultures and ultimately more about themselves. Regardless of whether the student’s major is science, engineering or the liberal arts, ANTH 109 is an elective of significance to a liberal education.

ARHI 251-252. Art Traditions I and II

This is a two-semester survey of the history of Western art, *either semester of which may be taken alone*. In the fall, the course follows the development of art, from the first remarkable images painted by prehistoric men on the ceilings and walls of the caves of Altamira and Lascaux, through the glorious era of Grecian humanism and Roman grandeur, to the period which produced the soaring, magnificent French Gothic cathedrals. In the spring semester, the course begins with a consideration of the Italian Renaissance and the reintegration of humans and their world in the work of such artists as Leonardo Da Vinci and Michelangelo. It continues with an examination of the expansive and opulent art of the baroque and then concludes with a discussion of the modern era from romanticism to impression, from cubism to abstract expressionism, and from pop to today. Either course satisfies the University’s fine arts requirement.

ECON 101. Principles of Economics I

An introduction to economics, with particular attention to the pricing mechanism, competitive and monopolistic markets, government regulation of the economy, labor-management relations and programs, income determination and public policy, foreign trade, and the international economy.

ECON 102. Principles of Economics II

Prerequisite: ECON 101.

A continuation of introductory economics with emphasis on the nature and method of economics, national income and its determinants, fluctuations in national income, money and credit, fiscal and monetary policies and economic growth.

FTT 104. Basics of Film and Television

Corequisite: FTT 104L. Serves as a prerequisite to upper-level film and television courses.

This is an introduction to film and television studies from a critical perspective, examining the form, meaning, and style of film and television texts. Students develop skills in the critical analysis of film and television. With a strong emphasis on narrative, the course examines film and television techniques, genre, stardom, and authorship. Students also will become acquainted with the major approaches to the study of film and television. Evening lab screenings are required.

FTT 105. Introduction to Theatre

Serves as a prerequisite to upper-level theatre courses. This is a study of theatre viewed from three perspectives: historical, literary, and contemporary production practices. Through lectures, readings, and discussions, students will study this art form to understand its relevance to other art forms and to their own lives. A basic understanding of the history of theatre and the recognition of the duties and responsibilities of the personnel involved in producing live theatre performances allows students to become more critical in their own theatre experiences. Requirements include attending live theatre performances and viewing videotapes.

HIST 111. Western Civilization I

A survey of the major events and issues in Western history, from the emergence of civilization in Egypt and Mesopotamia until the 15th century. Subjects studied at length include Greek culture, democracy, and imperialism; the Roman Republic and Empire; and the emergence of the Christian civilization of the Middle Ages. The contributions of Africa and Asia to Western culture also will be discussed. Fall only.

HIST 112. Western Civilization II

This course will examine important topics in European history from the Renaissance to the present: the evolution of statecraft in Machiavelli’s Florence; the impact of the Reformation on European society and political life; the English Civil War and the revolutions of the 17th century; the Scientific Revolution and the Enlightenment; the French Revolution and its aftermath; the development of liberalism, socialism, feminism and nationalism in the 19th century; the evolution of 20th-century warfare; the Russian Revolution of 1917; the bloody history of fascism and Nazism; the Holocaust; the “atomic age,” the Cold War and the collapse of the Soviet empire. **Spring only.**

HIST 115. The Growth of the American Nation

A survey of the social, cultural and political history of the British North American Colonies and the United States to the close of the Civil War. Organized around the question of American “nationhood,” topics include Indian, European and African encounters; regional and sectional divergence; religious impulses and revivals; imperial conflict and revolution; constitutional development and argument; immigration and nativism; the frontier hypothesis and westward expansion; slavery and emancipation; sectional division and the Civil War. Fall only.

HIST 116. The Development of Modern America

This course is a topical and chronological survey of the political, social, diplomatic and economic life of the American people from the end of the Civil War to the present. The principal areas of investigation will include the Reconstruction period, the age of industrialism, the progressive era, World War I, the Great Depression and the New Deal, World War II and the Cold War, the revolution in Civil Rights, Kennedy-Johnson and the war in Vietnam, and the troubled presidencies of Nixon, Carter and Reagan.

HIST 261F. American Catholic Experience

A survey of the history of Roman Catholicism in the United States from colonial times to the present, with emphasis on the 20th-century experience. The first half of the course covers the Catholic missions and settlements in the New World, Republican-era Catholicism’s experiment with democracy and the immigrant church from 1820 to 1950. The second half of the course focuses on the preparations for, and impact of, the Second Vatican Council (1962-65). Assigned reading includes a packet of articles and primary sources about the Liturgical Renewal, Catholic Action, social justice movements and other preconciliar developments. **Spring only.**

MUS 120. Introduction to Classical Music

A music appreciation course requiring no musical background and no prerequisites. General coverage of the various elements, styles and structures of music. Recommended for all first-year students.

MUS 121. Introduction to Jazz

A music appreciation course requiring no musical background and no prerequisites. General coverage of the history, various styles and major performers of jazz with an emphasis on current practice. Recommended for all first-year students.

MUS 123. Introduction to Music of the Catholic Rite

This course covers the music of the Church from Gregorian chant through repertoires composed in response to Vatican II. No prior musical experience is required. Recommended for all first-year students. **Fall only.**

MUS 125. Current Jazz

An in-depth study of current (within the past 10 years) trends and styles in jazz performance, along with a study of the major jazz artists and improvisors of today. Recommended for all first-year students.

**MUS 126. Introduction to American Music**

An appreciation-level course that concentrates upon the major stylistic and historical developments of American music since the colonial period.

MUS 127. Gender, Race, Class, Sexuality

A music appreciation course requiring no musical background and no prerequisites.

MUS 129. Introduction to Music of the 18th Century

Introduction to the major composers of the 18th century, including Bach, Handel and Mozart, and the genres of the century. No musical background required. *Fall only.*

MUS 230. Theory for Non-Majors

A one-semester survey of the structure of tonal music. Topics covered include chord formation, voice leading, harmonic progression, cadences, dissonance treatment and form. No musical background required.

MUS 241. Music History I

A survey of music. The study of the major forms and styles of Western history. Musical background required.

PHIL 101. Introduction to Philosophy

This course is a general introduction to philosophy and emphasizes such perennial topics as the existence of God, human freedom and moral obligation. The course is also intended to sharpen the student's skills of critical thinking.

Designed for first-year students, this course (or its sophomore-level equivalent, PHIL 201) is a University requirement and a prerequisite for all other philosophy courses. It typically requires both exams and short papers and combines lectures and discussion.

POLS 140. Introduction to American Politics

This course surveys the basic institutions and practices of American politics. The course emphasizes the institutional and constitutional framework of American politics so as to identify the key ideas needed to understand the subject and develop a basis for evaluating politics today. The premise of the course is that American government has advantages and disadvantages alike, which come from the same source—the Constitution and the American approach to power that it reflects. In particular, we will look at current events in light of the tendencies of the last 30 years, focusing on the changing roles of parties and interest groups—the traditional links between government and the people. Although the course should prepare prospective political science majors for further study of American politics, its primary aim is to introduce students of all backgrounds to the information and ideas that will enable them to understand American politics better, and to help them become more thoughtful and responsible citizens. This course fulfills a political science major requirement.

POLS 141. Introduction to International Relations

This course provides a basic understanding of the major concepts, issues, and theories in international relations. What explains conflict and cooperation in world politics? We will examine competing theories of state behavior, briefly review the evolution of international history, and discuss enduring and contemporary issues such as interstate war; civil, ethnic, and religious conflict; proliferation of weapons of mass destruction; terrorism; international trade and finance; globalization; the information revolution; and international law, organization, and institutions. The ultimate goal of the course is to enhance our capacity to think critically about the basic forces that drive international politics, thereby improving our ability to evaluate and shape our world. Discussion sections use historical and current events to illustrate concepts introduced in lectures. This course fulfills a political science major requirement.

POLS 142. Introduction to Comparative Politics

This course is an introduction to the main themes and areas of the comparative politics subfield. The course covers issues such as regime type, Leninism and socialism's collapse, authoritarianism and authoritarian collapse, Islam and theocracy, transitions to democracy, democratic state-building, political parties and electoral systems, economic reform, and civil and ethnic conflict. Geographically, the course introduces students to the institutions and politics of most regions of the world. The emphasis is on East Asia, Africa, the former Soviet Union, South Asia, and Latin America. This course fulfills a political science major requirement.

PSY 111. Introductory Psychology

No prerequisite.

The course poses and attempts to answer such questions as: What are psychologists and what do they do? What methods can be employed to further our understanding of behavior? How is the behavior of one person affected by that of others? What is intelligence and how does it develop? How does a child become an adult? How do we perceive the world around us? What role do heredity and the environment play in determining our behavior? What physiological variables affect behavior? What motivates people to behave as they do? What are emotions, what determines them and how can they be measured? What are the various states of consciousness and what alters them? What does it mean to be mentally ill, how does one get this way and what can be done about it? This is a lecture-course team taught by three instructors, each covering each one's respective specialty area. While Introductory Psychology is a required course for the psychology major, it is designed as an elective for any student with an interest in the behavior and interactions of human beings.

SOC 102. Understanding Societies

No prerequisite.

This course will show you how sociology can help you understand societies by looking at how people connect with each other through social relationships, groups, networks and organizations. Through this introductory course, you will discover answers to many questions you might have about societies and social interactions such as: How are stereotypes undermined? Where do their identities come from? What do people do when they experience role conflict? How are ideas and information diffused through networks? Why are there bureaucracies? How can you figure out what is going on in another culture? Why are some people more powerful than others? Who is in the middle class? How have race relations changed? Why do women earn less than men? How are some societies changing as a result of computer technology and the Internet, social movements, and the fact that women are having fewer children and people are living longer?

SOC 122. Social Psychology*No prerequisite.*

Social psychology studies how individuals and groups are influenced by other individuals and groups. In this broad introduction to social behavior, we will learn about what makes people do the things they do: What decides who someone will fall in love with? Where do aggressive, violent, and criminal behaviors come from? Why are some people more charitable than others? Why do some people obey authority and conform while others always have to buck the trend? Why are some people lazier when they work in groups? What is the source of people's stereotypes and prejudices? How can we overcome them? And finally, what makes us become who we are?

THEO 100. Foundations of Theology: Biblical/Historical

This course, or its sophomore-level equivalent (THEO 200), is a prerequisite for all other theology courses.

The course introduces students to theology as an academic discipline through an introduction to the Hebrew Bible, the New Testament and Christian literature of the post-biblical centuries.

Elective

The first-year curriculum provides an opportunity for each first-year student to take three elective courses. Typically, these courses are used to satisfy University or intended college program requirements or to sample areas that might be of interest.

Specific recommendations for the Course 4 elective are made for only three of the intended college programs. The College of Engineering recommends that first-year students planning programs in engineering take PHYS 131 in the spring semester as the Course 4 elective. Architecture intenders are advised to take ARCH 132G in the spring semester, while first-year students intending the combined College of Arts and Letters-Engineering Program are advised to take PHYS 131 in the spring semester.

COURSE DESCRIPTIONS FOR ELECTIVES**ARCH 143G. Graphics I: Drawing**

Instruction and practice in drawing as a means of exploring and communicating formal and theoretical concepts. Aspects of freehand drawing in pencil, charcoal, and watercolor are taught with subjects from buildings, nature, and the human figure. The course is open to all students. Studio format. Strongly recommended for those entering the architecture program.

PHYS 131. General Physics I

For a description of this course, please see the entry under "Natural Sciences, Series I—Laboratory Sciences," earlier in this section of the *Bulletin*.

**Course 5—
University or College
Requirement**

The following suggestions are offered as a guide in selecting the Course 5 electives.

1. Any of the arts and letters courses listed under Course 4 may be taken as a Course 5 elective.

2. A language course.

(a) Language is required by the College of Arts and Letters and the College of Science. The College of Arts and Letters requires its students to complete at least the intermediate level of a language and, regardless of initial placement level at Notre Dame, to take at least one course in the language at Notre Dame. In the College of Science, students who place higher than the intermediate level are considered to have fulfilled the language requirement and need not take any further courses in language. Language courses, however, are good electives for the other college programs.

(b) The languages available include Arabic, Chinese, French, German, Greek, Irish, Italian, Japanese, Latin, Portuguese, Russian and Spanish.

For French, Spanish and German, placement is based on the SAT II Subject Test, AP Test, or a Notre Dame departmental exam. *For Latin*, the AP test or Notre Dame departmental exam is required.

For all other languages, placement is made on the basis of a Notre Dame departmental exam or interview.

(c) The first-year student who plans to participate in an International Study Program must use the Course 3 and Course 5 slots to take both a natural science and foreign language. There is no opportunity to take a natural science course abroad, and the requirement must be satisfied by the end of the sophomore year.

3. A second science course.

The programs in the College of Science in the basic sciences—biology, biochemistry, chemistry, mathematics and physics—include more than one science. The second science course sequence for the chemistry and mathematics programs is PHYS 131–132; for the biochemistry and biology programs, it is BIOS 155–156; and for the physics program, it is PHYS 151–152. (Refer to "Natural Sciences, Series I," earlier in this section of the *Bulletin*.)

4. A special course.

(a) The College of Arts and Letters recommends that students intending programs in art take DESN 111S and ARST 121S; students intending programs in music take MUS 231 and 232 and a one-credit skills course each semester.

(b) Students intending to major in architecture are expected to take ARCH 143G and 144.

(c) College of Engineering intents should enroll in EG 111–112.

COURSE DESCRIPTIONS

ARCH 132G. Graphics II: Drafting

Instruction and practice in the skills necessary to draw and think like an architect. The course emphasizes mechanical drawing with exercises that include descriptive geometry, perspective, and other means of representing three-dimensional architectural problems with two-dimensional techniques, including those using computers. The course is open to all students. Studio format. Required for those intending to enter the architecture program.

ARCH 144. Analysis of Architectural Writing

This course examines concepts of architecture within writings about architecture. It explores universal issues of function, strength, and beauty, along with the interactions between theory and practice and the tensions between tradition and innovation. The coursework consists of analytical drawings, design exercises, and exams. It is open to all students. Required for those intending to enter the architecture program.

ARST 121S. Drawing I

No prerequisite.

A foundation course dealing with form depiction in its many aspects and modes. Intended for students entering studio practice for the first time. The student will learn the basics of drawing: proportion, perspective, light and shade. The student also will use a variety of media: pencil, pen and ink, charcoal, etc. Most of the work will be done in the studio, which meets six hours a week, with occasional outside assignments.

ARST 133S. Painting I

A basic course in oil painting systems, techniques and composition, including stretcher and canvas preparation.

ARST 149S. 3-D Foundations Studies

Open to a limited number of students.

An introduction to the basic techniques, materials and tools of the sculptor for those who wish to major in art. The student will explore the sculptural potentials of clay, wood, metal and paper in both figurative and abstract directions using fabrication, lamination, modeling and casting techniques. Emphasis is on technique and individual ideas. This course meets six hours per week.

DESN 111S. 2-D Foundations Studies

Open to a limited number of students.

Basis Design is a foundation course for those who wish to major in art. It is a course dealing with the fundamentals of two- and three-dimensional design. This course meets six hours per week.

EG 111–112. Introduction to Engineering Systems I and II

Corequisite: MATH 125 or equivalent. Required for engineering intents.

This sequence of two introductory courses is intended to introduce engineering intents to the role of engineers in society and to illustrate how engineers design systems and solve problems. It introduces basic engineering skills, including how to identify, formulate and solve problems, how to verify and communicate results, and how to use computers to aid in this process. The students are actively engaged in applying engineering design methods to solve practical problems. This involves a team approach to plan, design, analyze, implement, evaluate and report engineering activities.

The students are introduced to the University computer systems and resources and use various computers to perform automated calculations, information processing and engineering system control. Further instruction is provided in the use of spreadsheets and documents. Computer-based problem-solving environments, such as MATLAB, and structured language programming of microcontrollers are integrated into the courses as essential tools for today's engineers.

Group projects are used to introduce issues in multidisciplinary engineering system design. Project topics emphasize the use of modeling, analysis and simulation. Students are expected to design, fabricate, demonstrate and document the design of various simple systems, with particular emphasis on the use of microprocessors for information gathering and for control.

MUS 231–232. Music Theory I and II

A systematic approach to the understanding and manipulation of the basic materials of music. Required of and intended for music majors but open to students with sufficient musical background, with permission of instructor.

MUS 233–234. Musicianship I and II

Exercise and mastery of basic skills in music: melodic, harmonic, rhythmic and keyboard. To be taken along with Theory I and II. Required of all students intending to major in music. One credit.

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.



FIRST YEAR OF STUDIES

<i>Advanced Placement Examination</i>	<i>Advanced Placement Grade Required</i>	<i>Number of Credits Awarded</i>	<i>Notre Dame Course Typically Waived</i>
American History	4	6	History 115 and 116
Art History	4	6	Art Traditions 251 and 252
Biology	5	8	Biological Sciences 201 and 202 and 201L and 202L
Biology	4	3	Biological Sciences 101
Calculus AB	3	3	Mathematics 105
Calculus AB	4	4	Mathematics 125
Calculus BC	3	3	Mathematics 105
Calculus BC	4	8	Mathematics 125 and 126
Calculus BC (AB Subscore)	3	3	Mathematics 105
Calculus BC (AB Subscore)	4	4	Mathematics 125
Chemistry	5	8	Chemistry 117 and 118
Chemistry	4	3	Chemistry 101
Computer Science A	4	3	Business Administration 296 (elective credit)
Computer Science AB	4	3	Business Administration 296 (elective credit)
Economics (Macroeconomics)	5	3	Economics 102
Economics (Microeconomics)	5	3	Economics 101
English (either exam)	4	3	FYC 110 (formerly English 110)
European History	4	6	History 111 and 112
Government (American Politics)	4	3	Political Science 140
Government (Comparative)	4	3	Political Science 142
Latin (either exam)	4	6	Latin 102 and 103
Physics B	5	8	Physics 221 and 222
Physics B	4	6	Physics 115 and 116
Physics C, Mechanics	5	4	Physics 131
Physics C, Mechanics	4	3	Physics 115
Physics C, Elec. and Magnetism	5	4	Physics 132
Physics C, Elec. and Magnetism	4	3	Physics 116
Psychology	4	3	Psychology 111
Statistics	4	3	Business Administration 295 (elective credit)

Credit by Examination

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 and Spanish, (3) through the International Baccalaureate Program administered by International Baccalaureate North America, and (4) through the Notre Dame Examination Program.

1. **Advanced Placement Program** — Students who submit results of Advanced Placement examinations are eligible to receive credit in accordance with the accompanying table.

2. **SAT-II Subject Tests** — Results of CEEB Advanced Placement Examinations or the SAT-II Subject Tests in French, German or Spanish are used for course placement and credit by examination purposes in accordance with the accompanying table.

3. **International Baccalaureate Program** — Students who submit results of International Baccalaureate Higher Level examinations are eligible to receive credit in accordance with the accompanying table. The University does not give credit for Subsidiary Level examinations.

4. **Notre Dame Examination Program** — First-year students may take examinations for possible course credit in mathematics and foreign language. The examinations will be based on college-level courses. These departmental exams will be offered during the July language testing and advising sessions and again during the August orientation weekend.

In all of the cases, the credit awarded by the dean of the First Year of Studies is entered on the student transcript, which is maintained by the registrar's office. This 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 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.

FIRST YEAR OF STUDIES

<i>IB Examination Higher Level</i>	<i>IB Grade Required</i>	<i>Number of Credit Hours Awarded</i>	<i>Notre Dame Course Typically Waived</i>
Biology	6	6	Biological Sciences 101–107
	7	8	Biological Sciences 201–202
Chemistry	6	6	Chemistry 101–102
	7	8	Chemistry 117–118
Economics	6	6	Economics 101–102
English	6	3	First-Year Composition 110
Foreign Languages			
Arabic	6	6	Arabic 101–102
Chinese	6	6	Chinese 101–102
French	6	6	French 101–102
German	6	6	German 101–102
Italian	6	6	Italian 101–102
Japanese	6	6	Japanese 101–102
Latin	6	6	Latin 101–102
Russian	6	6	Russian 101–102
Spanish	6	6	Spanish 101–102
History of Americas	6	6	History 115–116
Mathematics	6	6	Mathematics 105–108
	7	8	Mathematics 125–126
Music	6	3	Music 220
Physics	6	6	Physics 115–116
	7	8	Physics 131–132
Psychology	6	3	Psychology 111
Sociology/Anthropology	6	3	Anthropology 109

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 115-116 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 the engineering college program since the initial physics course in this college program is PHYS 131. 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 125-126 also satisfies the mathematics requirement for programs requiring MATH 105-108 or MATH 119-120.

Language placement—Students with no previous background in a language should elect a beginning-level course. Students are required to complete three semesters of a language or equivalent course work. Those who place into an intermediate or advanced course are granted six credits by examination. A maximum of six credits can be granted for previous study in a given language.

Regardless of their scores on placement exams, students in the College of Arts and Letters must take at least one language course in residence at Notre Dame at the intermediate or higher level which deals with texts in the original language. 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 to take any additional courses in the language. Students contemplating an international study program which 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.

The placement exam for students who wish to begin language study in their sophomore year, will be given again prior to spring advanced registration. 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 test results.

FIRST YEAR OF STUDIES

SAT-II Subject Tests — Results of CEEB Advanced Placement Examinations or the SAT-II Subject Tests in French, French w/ Listening, German, German w/ Listening, or Spanish, Spanish w/ Listening are used for course placement and credit by examination purposes in accordance with the following schedules:

<i>FRENCH and FRENCH with LISTENING SAT-II Subject Test</i>	<i>Advanced Placement</i>	<i>Credits (Courses)</i>	<i>Placement Level</i>
790–800	5 (lang.)/4 (lit.)	6 (201F–202)	310 or 320F
690–780	4 (lang.)/3 (lit.)	6 (201F–202)	230F or higher
590–680	3 (lang.)/2 (lit.)	6 (102–201F)	202
490–580	2 (lang.)/1 (lit.)	6 (101–102)	201F/215
480	1 (lang.)	3 (101)	102/115

<i>SPANISH and SPANISH with LISTENING SAT-II Subject Test</i>	<i>Advanced Placement</i>	<i>Credits (Courses)</i>	<i>Placement Level</i>
800	5 (lang.)/4 (lit.)	6 (201E–202E)	310 or 320
690–790	4 (lang.)/3 (lit.)	6 (201E–202E)	230E or higher
570–680	3 (lang.)/2 (lit.)	6 (102–201E)	202E
460–560	2 (lang.)/1 (lit.)	6 (101–102)	201E
450	1 (lang.)	3 (101)	102/115

<i>GERMAN and GERMAN with LISTENING SAT-II Subject Test</i>	<i>Advanced Placement</i>	<i>Credits (Courses)</i>	<i>Placement Level</i>
790–800	5 (lang.)/4 (lit.)	6 (102–201)	202 or 300+
690–780	4 (lang.)/3 (lit.)	6 (101–102)	201
590–680	3 (lang.)/2 (lit.)	3 (101)	102

College Credit from Other Institutions

A. College courses completed on college campuses and used to satisfy high school graduation requirements or Notre Dame requirements for first-year admission are *not* accepted for credit.

B. Other college courses completed on college campuses prior to first-year enrollment at Notre Dame are considered for credit as determined by the First Year of Studies in consultation with the University's other colleges and departments. Normally, courses specified in the First Year Curriculum may not be satisfied through transfer credit. First-year students will be instructed to resolve all college credit situations before or during their **first semester** at Notre Dame and should present the necessary descriptions and other documentation as needed.

Advising Program

During the first year, academic and personal advising is provided by the First Year of Studies Office. First-year advising is done through a team approach. Each student is assigned to an advising team, which includes an advisor-director, several undergraduate peer advisors and consultants from among the faculties of the many departments of the University.

A meeting between a first-year student and a member of his or her advising team may be initiated by the advising team or by the student. A first-year student may request a meeting with a member of his or her advising team at any time and for any reason. All first-year students are encouraged to take advantage of this opportunity for personal guidance and assistance.



Learning Resource Center

The Learning Resource Center houses the Learning Strategies Program, the Tutoring Program, and the Collaborative Learning Program.

LEARNING STRATEGIES PROGRAM

All First Year students interested in improving their skills for success in college may schedule workshops or individual meetings. The Learning Strategies Program covers a variety of topics of practical value to students (e.g., time management, note-taking, test preparation), including individual assistance with writing and reading.

TUTORING PROGRAM

The First Year of Studies Tutoring Program is available to all first-year students who would like to improve their understanding of course material. Students meet in small groups of up to 15. The smaller size and more flexible pace of the tutoring session encourages peer interaction, which may not occur naturally in a large lecture format, in addition to the more traditional tutor-student interaction, and provides a conducive setting for students to ask individual questions.

The tutoring offered through this program is not meant to replace classroom instruction, tutorials, recitation-quiz sections, private meetings or any other aids offered by a teacher or through a course.

Some of the tutoring is done individually, but most is done in small groups. There is never a charge for tutoring in the First Year of Studies tutoring program.

COLLABORATIVE LEARNING PROGRAM

The Collaborative Learning Program is open to all first-year students. In collaborative learning sessions, students solve homework problems together with more of a focus on the problem-solving method used rather than the correct answer. Collaborative learning resource leaders monitor the sessions, encourage problem-solving and collaboration among group members, and help answer questions when necessary.



