

NATURAL SCIENCES



XAVIER
UNIVERSITY

NATURAL SCIENCES is an interdisciplinary biology and chemistry major specifically designed as a pathway for students wishing to pursue a career in medicine, dentistry or other health sciences. The program emphasizes the sciences required for admission into professional schools. Students obtain a solid foundation in liberal arts, regarded as an important base for forming effective health care practitioners, and develop the scientific background necessary for graduate and professional school study in numerous fields, including health professions.

Bachelor of Science (BS) in Natural Sciences

Minor: Natural sciences

The Xavier Advantage:

- ▶ Receive mentoring and shadowing opportunities from leading Xavier alumni in the Pre-Health Preceptorship Program.
- ▶ Engage in research side-by-side with faculty and present findings at regional and national meetings.
- ▶ Practice in mock interviews to prepare for graduate school admission.
- ▶ Receive pre-professional health career advising from a Xavier committee comprised of biology, chemistry and physics faculty.
- ▶ Join the Xavier chapter of the national pre-professional health honor society Alpha Epsilon Delta.
- ▶ Apply to medical and dental schools with the kind of preparation that enables Xavier graduates to be accepted at a higher rate than the national percentage.

Xavier natural sciences graduates go on to:

- ▶ Boston University
- ▶ Case Western Reserve University
- ▶ Georgetown University
- ▶ University of Illinois
- ▶ University of Michigan
- ▶ Johns Hopkins School of Medicine

Learn more www.xavier.edu/biology/Natural-Sciences.cfm

Ask us xuadmit@xavier.edu

Visit campus www.xavier.edu/visit



RECOMMENDED CLASS SCHEDULES

BACHELOR OF SCIENCE [BS] IN NATURAL SCIENCES

These schedules serve as a guideline for progress toward a degree. Students should consult with their academic advisor.

First Semester	Sem. Hrs.
FRESHMAN YEAR	
BIOL 160, General Biology I	3
BIOL 161, General Biology I Lab	2
CHEM 160, General Chemistry I	3
CHEM 161, General Chemistry I Lab	1
Foreign Language elective	3
ENGL 101 OR 115, Engl Comp/Rhetoric	3
Total	15

Second Semester	Sem. Hrs.
FRESHMAN YEAR	
BIOL 162, General Biology II	3
BIOL 163, General Biology II Lab	2
CHEM 162, General Chemistry II	3
CHEM 163, General Chemistry II Lab	2
Foreign Language elective	3
PHIL 100, Ethics as Intro to Phil	3
Total	16

SOPHOMORE YEAR	Sem. Hrs.
SOPHOMORE YEAR	
CHEM 240, Organic Chemistry I	3
CHEM 241, Organic Chemistry I Lab	1
PHYS 160, College Physics I	3
PHYS 161, Introductory Physics Lab I	1
MATH 150, Elements of Calculus I OR MATH 170, Calculus I	3 (4)
THEO 111, Theological Foundations	3
Total	14/15

SOPHOMORE YEAR	Sem. Hrs.
SOPHOMORE YEAR	
CHEM 242, Organic Chemistry II	3
CHEM 243, Organic Chemistry II Lab	1
PHYS 162, College Physics II	3
PHYS 163, Introductory Physics Lab II	1
MATH 156, General Statistics OR MATH 171, Calculus II	3 (4)
ENGL/CLAS/SPAN/FREN 205 Lit & Moral Imag	3
Cultural Diversity elective	1
Total	15/16

JUNIOR YEAR	Sem. Hrs.
JUNIOR YEAR	
BIOL 410, Vertebrate Physiology	2
BIOL 411, Vertebrate Physiology Lab	2
CHEM 220, Principles of Physical Chem	3
CHEM 221, Analytical Chemistry Lab	1
History I elective	3
Theo Scrip/Hist OR Christ Sys elective	3
Literature elective	3
Total	17

JUNIOR YEAR	Sem. Hrs.
JUNIOR YEAR	
BIOL 230, Genetics	3
BIOL 231, Genetics Lab	1
BIOL 354, Vertebrate Anatomy	2
BIOL 355, Vertebrate Anatomy Lab	2
PHIL 290, Theory of Knowledge	3
History II elective	3
Total	14

SENIOR YEAR	Sem. Hrs.
SENIOR YEAR	
BIOL 498/CHEM 400 Biology OR Chemical Research	1
Biology OR Chemistry elective ¹	4
Theology Ethics OR Rel/Cult elective	3
Philosophy elective	3
PSYC 101, General Psychology	3
Total	14

SENIOR YEAR	Sem. Hrs.
SENIOR YEAR	
BIOL 499/CHEM 400, Biological OR Chemical Research	1
Biology OR Chemistry elective ¹	2
Social Science elective	3
E/RS Focus elective	3
General elective	3
Fine Arts elective	3
Total	15

- Scheduling notes:** ¹ Student selects a senior year concentration of courses plus research in either biology or chemistry. Courses vary from year to year, so contact your academic advisor for current selections. Students concentrating in chemistry should add chemical literature (one credit hour) to their junior year schedule.
- Consult the undergraduate Core Curriculum requirements.
 - The E/RS Focus elective requirement may be used to satisfy another element of the Core or the major.
 - A minimum of 120 credit hours is required for the degree.
 - Students are required to take 6 hours of approved courses representing two different disciplines to fulfill the Core Diversity requirement.

► For additional degree class schedule information, see www.xavier.edu/biology/Natural-Sciences.cfm.

THE PROGRAM

The Department of Biology offers the Bachelor of Science (BS) degree in Natural Sciences in cooperation with the Departments of Chemistry and Physics. Students may choose to focus on applied physics, biology or chemistry as part of the natural sciences major. A minor in natural sciences also is available for undergraduate students who wish to complete science courses generally required of applicants to medical school while completing their bachelor's degree in a non-science major.

Important admission information: The natural sciences program has a limited number of spaces each year for undergraduates. Admission is competitive. In fact, because the natural sciences major is so popular, and available spaces are limited, Xavier may place interested students on a waitlist for enrollment in the program. It is advisable to apply early and indicate natural sciences as the intended major. For more information on admission requirements, visit www.xavier.edu/undergraduate-admission/admission-process.

A solid foundation in the liberal arts is regarded by admission committees at graduate and professional schools as one of the most important factors in forming effective and capable health care professionals.

Undergraduate research is required of all natural sciences majors. Students have numerous opportunities to present their research results to the science departments and the University, and at regional and national professional meetings.

Faculty members are readily available to students through individual counseling sessions and through a high degree of student-faculty interaction in laboratory instruction. Classes are instructed by faculty, not by graduate teaching assistants. Peer-led supplemental instruction provides additional review of course materials. Tutors are also available.

RESOURCES

The Department of Biology is housed in Albers Hall, a three-story building renovated in 1992. It contains seven teaching laboratories well-equipped with compound and stereoscopic microscopes, models and specimens. Specialized equipment is maintained for the study of vertebrate physiology, plant biology, development, anatomy, genetics, and bacteriology. An additional seven labs are devoted to research projects performed by faculty and student groups.

The following programs offer undergraduates direct contact with medical professionals:

- ▶ **Alpha Epsilon Delta:** Xavier hosts a national chapter of the national pre-professional health honor society. Upperclassmen who demonstrate exemplary service and scholarship in pre-professional health studies are invited to join. Students also may choose to participate in student-governed pre-med and pre-dental society clubs to participate in group service events and other activities outside the classroom.
- ▶ **Pre-Health Preceptorship Program:** Xavier alumni offer students mentoring and shadowing opportunities.

OUTCOMES

A degree in natural sciences prepares students to go on to study medicine, dentistry and other health specialties, and also to enter graduate school to obtain an advanced degree. An advanced degree also prepares a natural sciences graduate to be hired for a faculty position in life sciences departments in colleges and universities.

Individuals who graduate with a degree in natural sciences, with or without advanced degrees, can be hired as researchers in industry, government agencies, medical centers and drug companies.

The wide range of career options for natural science majors includes:

- Environmental health
- Food and drug administration
- Hospital administration
- Industrial research
- Optometry
- Osteopathic medicine
- Pharmacy
- Physical therapy
- Podiatry
- Public health
- Research and consulting organizations
- Veterinary medicine

Xavier's pre-medical/pre-dental graduates have been accepted at medical and dental schools across the country.

- Over the past three years, 84 percent of Xavier pre-medical graduates have been accepted into professional schools, compared to 45 percent nationally.
- Over the past five years, 63 percent of Xavier's pre-dental graduates were accepted to dental schools, compared to the national dental school acceptance rate of 40 percent.

Xavier natural sciences graduates have gone on to advanced study at a range of institutions including:

- Baylor University
- Boston University School of Medicine
- Case Western Reserve University
- Creighton University
- Georgetown University
- Indiana University
- Johns Hopkins School of Medicine
- Loyola University of Chicago
- Marquette University College of Dentistry
- Michigan State University College of Osteopathic Medicine
- Ohio State University Schools of Medicine, Dentistry, Pharmacy, Optometry, Veterinary Sciences, and graduate Physical Therapy
- Scholl College of Podiatric Medicine
- St. Louis University
- Temple University
- Tulane University
- University of Cincinnati Schools of Medicine, Pharmacy, Physical Therapy and graduate Nursing
- University of Illinois
- University of Kentucky School of Medicine, Pharmacy and Dentistry
- University of Louisville,
- University of Miami
- University of Michigan
- University of Southern California School of Optometry
- Vanderbilt University
- Wright State University

PRE-PROFESSIONAL HEALTH ADVISING

All Xavier students have a faculty advisor in their academic major/area of study. To help students prepare for successful admission to a health professional school, Xavier also provides each student with a separate advisor through the Office of Pre-Professional Health Advising.

Xavier University's Health Sciences Committee is comprised of science faculty from biology, chemistry and physics committed to encouraging student access and success in professional health careers. With the Director of Pre-Professional Health Advising, the committee works with students on their preparation for application to professional graduate health programs in important ways:

- ▶ Writing a composite committee letter of recommendation for professional health schools.
- ▶ Conducting a mandatory mock interview that helps prepare an applicant for admission interviews.
- ▶ Offering guidance on professional health and science-related graduate programs and career options.

Advising workshops on various hot topics for students are held throughout the year, and full-length and computerized AAMC Practice MCAT tests are offered twice a year at a significantly reduced cost for students. (Learn more by reviewing the separate academic brochure called Pre-Medicine & Pre-Health.)

CORE CURRICULUM

The foundation of Xavier's success is its commitment to its Jesuit heritage. The Core Curriculum embodies Xavier's mission and philosophy of education and serves as a valuable foundation for all undergraduate students. Within the Core, the four-course Ethics/Religion and Society (E/RS) Focus fosters students' understanding of socially significant issues through study of the humanities, especially literature, philosophy and theology, as well as the social and natural sciences. Along with courses in their major, Xavier students also take Core courses in: cultural diversity, English composition, fine arts, foreign language, history, literature, mathematics, philosophy, science, social science and theology.

ACADEMIC REQUIREMENTS

Core Curriculum: Minimum 64 credit hours

Major in natural sciences: 59 credit hours, including 20 semester hours of biology, including general biology, physiology, anatomy and genetics; 24 semester hours of chemistry, including general, organic, physical and biochemistry; and eight semester hours of physics. An additional five to six semester hours in a biology or chemistry concentration must also be completed.



XAVIER AT A GLANCE

Founded in 1831, Xavier University is a Jesuit Catholic university in Cincinnati, Ohio, annually ranked among the nation's best universities. Its three colleges offer 85 undergraduate majors, 54 minors and 11 graduate programs to 7,019 total students, including 4,368 undergraduates.

FOR MORE INFORMATION

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