

UNDERGRADUATE CATALOG 2016–17

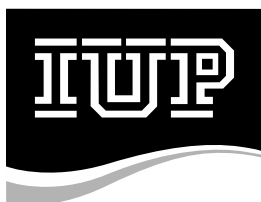
College of Natural Sciences and
Mathematics

www.iup.edu/natsciandmath

College Information
Sustainability Studies Minor

This document is a direct extract from the full 2016–17 *Undergraduate Catalog*. As a result, the original page numbering will appear.

For information on other colleges at IUP, or about specific courses, please consult the full 2016–17 catalog, available at www.iup.edu/registrar/catalog. Earlier catalogs are also available at this web address.



Indiana University of Pennsylvania

The College of Natural Sciences and Mathematics

Deanne L. Snavey, Dean

Aleksandra B. Kaniasty, Assistant Dean

Daniel A. Burkett, Dean's Associate for Academic Affairs

Website: www.iup.edu/natsciandmath

We change lives through science and math. Our graduates change the world as educators, scientists, and leaders.

We change lives through:

- opportunities to explore, create, and innovate,
- team-based problem-solving in teaching and learning,
- interdisciplinary scientific research, and
- challenges that inspire individual achievement.

These four mission objectives encompass the College of Natural Sciences and Mathematics' (CNSM) approach for education of its students now and in the future. New scientific and mathematical methods often arise through an integration of qualitative and quantitative concepts to identify patterns and processes. Thus, progress in the natural sciences and mathematics is maximized through interdisciplinary-collaborative teams built on separate and specific knowledge and approaches of their respective disciplines. Scientific endeavors increasingly depend on this integrative approach that includes interconnecting scientific theory, experimentation, and simulation. Solutions to the problems facing future generations will involve ever larger and more complex databases capturing information of ever finer resolution. The college's graduates become responsible lifelong learners, applying lessons learned in the natural sciences and mathematics to their professional and personal lives, changing the world as educators, scientists, and leaders.

Degrees Offered

- Biochemistry
- Biology (Tracks available: Cell and Molecular; Ecology, Conservation, and Environmental Biology; Environmental Health; Pre-medical; Pre-veterinary; Honors)
- Biology Education
- Chemistry (Tracks available: Interdisciplinary Chemistry, Pre-medical, and Pre-pharmacy)
- Chemistry Education
- Computer Science (Tracks available: Cyber Security, Languages and Systems, Software Engineering)
- Earth and Space Science Education
- Geology (Tracks available: Geology, Energy Resources, Environmental)
- Mathematics (Tracks available: Actuarial, Applied)
- Mathematics Education
- Natural Science (Tracks available: Pre-audiology, Pre-chiropractic, Pre-dentistry, Pre-optometry, Pre-pharmacy, Pre-physical Therapy, Pre-physician, Pre-podiatry)
- Physics (Tracks available: Applied Physics, Nanomanufacturing Technology, Pre-engineering)
- Physics Education
- Psychology (Track available: Honors)

Degree Requirements

In addition to the university's Liberal Studies requirements, all students seeking a baccalaureate degree in the CNSM must complete the requirements for a major as established by the department through which they wish to specialize. Statements of these requirements and those for minor in a specific field appear in the department sections that follow. A double major or minor may encompass a discipline outside as well as within the college but should be selected only with advisor approval. As a general principle, there is considerable latitude in course choice for Natural Sciences and Mathematics majors; for specifically required courses, substitution in any program must have the written approval of the student's department chairperson or the college dean.

Degrees

The departments of Biology, Chemistry, and Computer Science offer work leading to either a bachelor of science or a bachelor of arts degree, depending on the specific course program pursued. The bachelor of science degree is awarded for successful work in the departments of Geoscience, Mathematics, Natural Science, and Physics. The bachelor of arts degree is awarded by the Department of Psychology.

Several departments in the college sponsor master of arts, master of science, or professional science master's degrees. The Department of Psychology offers the doctor of clinical psychology degree. Information on these programs can be obtained from the School of Graduate Studies and Research.

The Foreign Language Requirement

Several programs require some level of foreign language competency. See individual program requirements for more information.

Any foreign student, registered as such at IUP, whose acquired native language is other than English and who demonstrates an acceptable proficiency in English, is exempt from the foreign language requirement for a Natural Sciences and Mathematics degree if the department he/she is majoring in does not require a specific language not thus covered.

Internship Programs

Several departments in the CNSM have established extensive internship programs under which students engage in an off-campus supervised work experience for credit. For more information about specific internship programs, students should consult with the chairperson of the department in which the student is majoring. Students eligible for internships may receive federal or state funding.

Preprofessional Programs

The college offers programs for the preparation of students for acceptance by a professional school: pre-medical (including osteopathic medicine) and pre-veterinary medicine. In addition, the college offers a major in the natural sciences for those students whose goal is audiology, dentistry, pharmacy or pharmacology, optometry, podiatry, chiropractic medicine, or physical therapy. All programs are so designed that, should work at a professional school not ensue, the student may earn an IUP baccalaureate degree, provided he/she has been faithful to faculty advisement.

The preprofessional health programs in the college presuppose that the student has an excellent background in the high school sciences and mathematics and will prove to be an excellent college student. Students should identify their proposed field of study upon admission to IUP.

Cooperative Programs

IUP has been fortunate to enter into cooperative agreements with a number of outstanding institutions to provide significant career opportunities to students. These formal agreements provide for accelerated graduate or professional degree programs or carefully planned and coordinated undergraduate programming with the cooperating institution. Programs are intended to ensure acceptance of properly qualified students by the cooperating professional schools. Additional information about specific programs can be found under the appropriate academic department in this catalog.

- **Chiropractic** (See Natural Science): The New York Chiropractic College, Palmer Chiropractic College, Sherman College of Straight Chiropractic, Parker College of Chiropractic, and Logan Chiropractic College programs are designed to accelerate professional training of IUP students in the field of chiropractic medicine.

- **Dentistry** (see Natural Science): The Temple University School of Dentistry program is designed to accelerate the professional training of IUP students in the field of dentistry.
- **Jefferson Medical College, Physician Shortage Area Program** (See Department of Biology): The program increases the opportunities for IUP students to be admitted to Jefferson Medical College.*
- **Lake Erie College of Osteopathic Medicine (LECOM)** (See Department of Biology): LECOM and IUP have a cooperative “3+4” program. Students will be awarded a BS degree with a major in biology from IUP upon successful completion of the first-year curriculum at LECOM and of the undergraduate requirements at IUP.*
- **Optometry** (See Natural Science): The Pennsylvania College of Optometry program accelerates the professional training of IUP students in the field of optometry.
- **Pharmacy** (see Natural Science): The Shenandoah University School of Pharmacy or LECOM School of Pharmacy programs are designed to accelerate the professional training of IUP students in the field of pharmacy.
- **Physical Therapy** (see Natural Science): The Gannon University School of Physical Therapy program is designed to enhance the professional training of IUP students in the field of physical therapy.
- **Podiatry** (See Natural Science): The Temple University School of Podiatric Medicine program accelerates the professional training of IUP students in the field of podiatry.
- **Primary Care Scholars Program:** This program enables the college to identify students with primary care potential and to provide these students with the opportunity to interact with primary care faculty, physicians, and medical students at the Pennsylvania State University College of Medicine for one week during the summer.*
- **Philadelphia College of Osteopathic Medicine (PCOM)** (See Department of Biology): PCOM has established this “3+4” Early Acceptance program with IUP. The program will enable students who have demonstrated academic excellence and a commitment to the practice of medicine to gain a provisional acceptance to PCOM. Students will be awarded a BS degree with a major in biology from IUP upon successful completion of the first-year curriculum at PCOM and the undergraduate requirements at IUP.*

*Contact the pre-medical advisor, R. Hinrichsen, for specific information.

Sustainability Studies Minor

Karen Rose Cercone, College Contact

The Sustainability Studies minor is an interdisciplinary program that draws from expertise across the university. The program conceptualizes “sustainability” as an interdisciplinary approach to knowledge production and action that focuses on “the health and integrity of human societies and the natural world.” Sustainability is classically defined as a stool with three legs—the social, the economic, and the environmental; the purpose of this program is to address the challenges of sustainability by balancing the humanities, social sciences, and natural sciences. The minor equips students to broaden their thinking about the origins of sustainability problems and possible solutions to include human institutions, ethics and cultures, as well as technologies and natural sciences. In so doing, the minor aims to foster student agency with regard to research on sustainability, responsibility to both human and non-human life, and civic engagement with local sustainability projects. The minor can supplement all majors in the university. Career possibilities include positions in design, law, food industries, planning and architecture, education, building certification, renewable energy, and waste management.

Students must complete 18 credits and a capstone experience (described below) to earn a minor in sustainability studies. The program’s interdisciplinary approach encourages students to take courses from a variety of departments. The program is structured as follows:

1. All students will take SUST 201 Introduction to Sustainability.
2. Students must then take at least 12 credits from Category A, defined as courses in which substantial content is foundational to engagement with sustainability. These credits must be distributed across three “clusters,”

- each of which denotes a major aspect of sustainability. Having taken one course from each of the three clusters, students will then be able to take the remaining Category A credits from a cluster of their choosing.
3. Only 3cr may come from Category B, defined as courses in which significant content is foundational to engagement with sustainability. Because their content may vary, courses from Category B must be approved by the program director to count for the minor.
4. At least 6cr must be at the 300 level or above.
5. Only one course may come from the student’s major.
6. With the exception of SUST courses, no course prefix may be used more than twice without written permission from the program director.
7. Special topics, independent study courses, and internship courses may be applied to either Category A or Category B with the approval of the Sustainability Studies Committee.
8. Students should consult with the program director to determine if there are any prerequisites for the courses. Through counseling, the program coordinator will work with individual departments to determine if students may qualify for prerequisite exemptions.
9. Students will work with an advisor from the Sustainability Studies program to develop a capstone experience that synthesizes their knowledge and skills related to sustainability. This requirement may be fulfilled by one of the following options: a portfolio, conference presentation, or other scholarly activity approved by the program director.

Minor—Sustainability Studies 18

Required course: 3

SUST 201 Introduction to Sustainability 3cr

Category A 12-15

Cluster I: Ethics, Culture, and Society

ANTH 420 Environmental Anthropology 3cr

ANTH 430 Anthropology of Food 3cr

ENGL 361 Environmental Literature 3cr

HIST 385 People in Nature 3cr

PHIL 270 Ethics and the Environment 3cr

RLST 365 Native North American Religions 3cr

Cluster II: Natural Sciences and Environmental Stewardship

BIOL 103 Life on Earth 4cr

BIOL 114 Environmental Science 3cr

BIOL 115 Biotic Diversity of North America 3cr

BIOL 201 Principles of Ecology and Evolution 4cr

BIOL 221 Environmental Health and Protection 4cr

BIOL 272 Conservation of Plant and Animal Resources 3cr

BIOL 450 Field Biology at Pymatuning Laboratory of Ecology 4cr

BIOL 490 Field Studies in Biology 3cr

GEOS 101 The Dynamic Earth 3cr

GEOS 103 Oceans and Atmospheres 3cr

GEOS 310 Environmental Geology 4cr

GEOS 370 Oceanography 4cr

PHYS 101 Energy and Our Environment 3cr

PSYC 331 Environmental Psychology 3cr

Cluster III: Environmental Policy, Economics, and Law

CRIM 374 Environmental Crime and Justice 3cr

ECON 361 Environmental Economics 3cr

FDNT 470 Human Food Consumption Patterns 3cr

GEOG/RGPL 103 Global Cities: Issues in Planning and Development 3cr

GEOG 104 World Geography: Global Context 3cr

GEOG/RGPL 343 Geography of Fresh Water Resources 3cr

GEOG/RGPL 345 Biogeography for Environmental Managers 3cr

GEOG/RGPL 440 Conservation: Environmental Analysis 3cr

MKTG 444 Green Marketing 3cr

RGPL 426 Environmental Land Use Planning 3cr

Category B 0-3

ANTH 110 Contemporary Anthropology 3cr

ANTH 213 World Archaeology 3cr

ANTH 314 Contemporary Native American Cultures 3cr

ANTH 444	Medical Anthropology	3cr
ART 113	Three-Dimensional Design	3cr
ART 213	Woodworking: Function and Form	3cr
BIOL 323	Introduction to Toxicology and Risk Assessment	3cr
BIOL 362	Ecology	3cr
BIOL 456	Ecological Toxicology	3cr
BIOL 460	Fundamentals of Environmental Epidemiology	3cr
ECON 338	Poverty in Africa	3cr
ECON 339	Economic Development I	3cr
ECON 365	Economics of Tourism	3cr
GEOG 230	Cultural Geography	3cr
GEOG 435	Geography of Energy	3cr
GEOS 150	Geology of National Parks	3cr
GEOS 152	Physical Resources of the Earth	3cr
GEOS 201	Foundations of Geology	4cr
GEOS 324	Geology of Oil and Gas	4cr
JRNL 375	World News Coverage	3cr
JRNL 466	Community Journalism	3cr
KHSS 143	Physical Well-Being	3cr
NURS 143	Healthy People—Promoting Wellness	3cr
PHIL 122	Contemporary Moral Issues	3cr
PLSC 250	Public Policy	3cr
PLSC 389	International Development Strategies	3cr
PSYC 330	Social Psychology	3cr
RLST 485	Selected Topics in Feminist Studies of Religion	3cr
SOC 314	Sociology of Native Americans	3cr
SOC 337	Society, Globalization, and Risk	3cr
SOC 340	Sociology of Industry	3cr
SOC 417	Global Service Learning	3cr
