

## **COLLEGE OF SCIENCE CORE REQUIREMENTS (Information For Biology Majors)**

This document was last updated on June 16, 2009. It applies to students who enter Purdue Fall 2007 and after. The most recent information about Science degree requirements is available at <http://www.science.purdue.edu/core/requirements2.asp>.

### **COMPOSITION AND PRESENTATION**

**Freshman Composition:** All students must complete one of these Freshman Composition options:

- ENGL 10600 (First-Year Composition)
- ENGL 10800 (Accelerated First-Year Composition).

**Technical Writing and Technical Presenting (TWTP):** *Non-native English speakers are required to take COM 21700, Science Writing and Presentation. Native English speakers may fulfill the TWTP requirement using the options listed below.*

**Technical writing:** This requirement can be met by completing one of the following options:

- 1) Science-based technical communication course:
  - BIOL 23200 (27100) (Lab in Cell Structure & Function)
  - BIOL 28900 (Honors Laboratory in Organisms and Population)
  - COM 21700 (Science Writing & Presentation)
- 2) Other courses may be available (see your advisor for more information)
- 3) Scholarly publication (any one of the following three) (must follow CoS guidelines – check before writing paper[s])
  - a. Paper accepted for publication in a peer-reviewed journal or peer-reviewed conference proceedings in which the student is the lead author or has written the large majority of the paper
  - b. Paper a College of Science faculty member with expertise in the area deems of publishable quality
  - c. Three approved papers of at least 1,500 words each at least one of which makes a strong or persuasive argument.

**Technical presentation:** Requirement can be met by completing one of the following options:

- 1) Science-based technical communication course:
  - BIOL 23200 (27100) (Lab in Cell Structure & Function)
  - BIOL 28900 (Honors Laboratory in Organisms and Population)
  - BIOL 44100 (Senior Seminar in Genetics)
  - COM 21700 (Science Writing & Presentation)
- 2) Other courses may be available (see your advisor for more information)
- 3) Presentation at a scientific meeting (sole or predominant presenter) (must follow CoS guidelines – check before presentation)
- 4) Presentation of work at an adjudicated poster session (must follow CoS guidelines – check before presentation)
  - a. Presentation must be made in the presence of a certified judge
  - b. Written feedback must be provided to the student
- 5) Presentation of work during an internship or co-op (must follow CoS guidelines – check before presentation)
- 6) Three approved 10-minute (or longer) presentations within science course(s) (must follow CoS guidelines – check before presentation)

### **TEAMBUILDING AND COLLABORATION**

Students must learn the concepts involved in science team projects --team function, team roles, common goal, and utilizing strengths of team members. Must meet both Teamwork and Collaboration Principles and Experience. Principles must precede Experience. Can be met by completing one of the following options:

- 1) Teamwork and Collaboration Principles:
  - SCI 13000 (Team Work)
  - ABC program
  - Science Teambuilding and Leadership Institute (STALI)
- Teamwork and Collaboration Experience:
  - BIOL 39500 (Principles of Physiology) (spring 2009 only)
  - BIOL 59500 (Physiology BioDesign Lab) (fall 2009 only)
  - CS 15800 (C Programming) (fall 2009)
  - CS 17700 (Programming with Multimedia Objects) (spring 2008, fall 2009)
  - SCI 11000 (Science Honors Seminar)
  - PHYS 17200 (Modern Mechanics)
  - ENTR capstone course
  - Approved EPICS, Co-op, Internship, or Research Experience
- 2) Approved teambuilding and collaboration activity that satisfies requirements of both the principles and experience:
  - ENGR 12600 (Engineering Problem Solving & Computer Tools)
  - EDCI 49800 (Supervised Teaching Experience)
- 3) An approved course in teambuilding and collaboration.

### **MATHEMATICS**

Students must take a minimum of a one-year sequence of single variable calculus. Options include:

- MA 16100 (Plane Analytic Geometry and Calculus I) and MA 16200 (Plane Analytic Geometry and Calculus II)
- MA 16500 (Analytic Geometry and Calculus I) and MA 16600 (Analytic Geometry and Calculus II)
- MA 23100 (Calculus for Life Sciences I) and MA 23200 (Calculus for Life Sciences II) (**Not an option for other CoS majors**).

### **STATISTICS**

STAT 50300 (Statistical Methods for Biology) is the required statistics course for Biology majors.

### **COMPUTING**

Students must take a course in computing concepts taught using an interpreted or compiled programming language. Course content will include basic control structures and function calls. One of these (or an equivalent course) must be completed:

- CS 15800 (Programming I)
- CS 15900 (Programming Applications for Engineers)
- CS 17700 (Programming With Multimedia Objects)
- CS 18000 (Programming I)
- CS 19000 (Introduction to Computational Thinking)

## LANGUAGE AND CULTURE

All College of Science majors are expected to have an understanding of another culture in addition to their own. This can be demonstrated by completing:

- 1) 3 courses from option 1; **or**
- 2) 2 courses from option 1 and 1 additional course from options 2 or 3; **or**
- 3) An approved study abroad experience that satisfies the following:
  - a. Must be at least one semester in duration and must take place outside the United States.
  - b. Must consist of taking courses and/or working on a research project.
  - c. The student must have significant immersion in the local culture and language independent of any US-based program in which the student may be participating.
- 4) Students whose **native language is not English** may also use demonstrated proficiency in their native language to fulfill this requirement. See advisors for guidelines for demonstrating proficiency.

### Language and Culture options

- 1) Courses in a foreign language, other than your native language. All courses must be in the same language.
- 2) Courses on culture and/or civilization of a foreign culture. (<http://www.science.purdue.edu/core/ApprovedCultureCourses2007.asp>)
- 3) Approved courses on diversity. (<http://www.science.purdue.edu/core/ApprovedDiversityCourses2007.asp>)

## GENERAL EDUCATION:

### Great Issues In Science

This requirement addresses the impact of Science on society and the ramifications of scientific advances. The list of approved courses:

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| • BIOL 48300 (Environmental & Conservation Biology) (fall 2009 only) | • HONR 39900 (Biotechnology: Social & Ethical Issues) (fall 2009 only) |
| • EAS 39100 (Changing the Water Paradigm) (spring 2009 only)         | • OLS 58100 (Communicating Global Climate Change).                     |
| • EAS 39100 (Fossil Fuels, Energy & Society)                         | • PHYS 31700 (49000) (Special Nuclear Materials)                       |
|  | • SCI 49000 (Great Issues in Science)                                  |

### Humanities / Social Sciences And / Or Management

All College of Science students will be required to select three courses (9 credits) from the areas listed below, per the following guidelines:

- 1) A two-course sequence (6 credits) must be selected from area (a) Humanities / Social Sciences. The second course in the sequence should be an extension or enhancement of the first. (This could be a second course in a series or a course that adds an interdisciplinary approach, i.e. a course in US history could be followed with a course in Women's studies or in African American studies or may be an approved experience, internship etc.)
- 2) To complete the requirement, students must take one additional course (3 credits) from either of the two areas listed below.
  - a. Humanities / Social Sciences (Approved courses in literature, philosophy, history, political science, psychology, sociology, anthropology, interdisciplinary studies, communication, or visual and performing arts.) **or**
  - b. Management (Approved courses in management, economics, or organizational behavior and resource management.)

### Unacceptable Courses:

Independent research courses are not acceptable. Courses cross-listed with a course in the College of Science or any that have a laboratory or studio component are also not acceptable. In addition, the following specific courses are not acceptable to meet this requirement:

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| • PHIL 15000 (Principles of Logic)           | • PSY 50000 (Statistical Methods Applied to Psychology, Education, and Sociology) |
| • PHIL 45000 (Symbolic Logic)                | • PSY 50100 (Mathematics Essential for Quantitative Psychology)                   |
| • PHIL 55000 (Advanced Symbolic Logic)       | • SOC 38200 (Introduction to Methods of Social Research)                          |
| • PSY 20400 (Use of Computers in Psychology) |   |

## LABORATORY SCIENCE

Biology majors meet this requirement automatically because of the chemistry and physics required of biology majors.

## MULTIDISCIPLINARY EXPERIENCE

The multidisciplinary requirement can be met by completing one of the following options:

- 1) Complete a course or experience which involves a multidisciplinary approach to examining a problem or issue, preferably involving multidisciplinary teams at the junior level or above. Approved choices include:
  - approved research project or internship (must get CoS approval prior to the project/internship)
  - Entrepreneurship certificate.
  - BIOL 39500 (Household Biology & Chemistry)
  - BIOL 47800 (Introduction to Bioinformatics)
  - BIOL 56200 (Neural Systems)
  - BIOL 59500 (Physiology BioDesign Lab) (fall 2009 only)
  - CHM 59900 (Applied Bioinformatics)
  - EDCI 42100 (The Teaching of Biology in Secondary Schools)
  - MA 37300 (Financial Mathematics)
  - MA 49000 (Computational Cell Biology)
  - SCI 29000 (Integrated Science)
- 2) Complete an additional major or minor which gives the student experience in another discipline's approach to examining important problems and issues in that discipline. Such an additional major or minor must require at least 3 courses not required for the student's major.