INDIANA UNIVERSITY

University Graduate School
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Academic Bulletin

Scientific Computing

College of Arts and Sciences
Bloomington

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Associate Professors
Randall Bramley* (Informatics), Gregory Olyphant* (Geological Sciences)

Ph.D. Minor in Scientific Computing

Scientific computing is an interdisciplinary, interdepartmental graduate minor recognizing important changes that have introduced a powerful and entirely new mode of scientific research. The increasing availability of high-performance computers has led to a method of scientific inquiry based on mathematical models solved by means of numerical computations, analyzed and viewed by means of advanced computer graphics. Carrying out research by these means is necessarily multidisciplinary, calling on advanced skills in areas that span many classical divisions of academia. The Ph.D. minor in scientific computing provides the interdepartmental education necessary to equip students for research within this new paradigm. Scientific computing courses are generally organized into four categories: numerical analysis, behavior of systems, scientific visualization, and high-performance computing. Students are encouraged to develop expertise in more than one of those areas.

Course Requirements
Twelve (12) credit hours in approved courses, 6 credit hours of which must be outside the student's major department. The course P573 Introduction to Scientific Computing I has been created as an introductory course for students in the program. Students entering with a background in computational science or engineering, in consultation with their advisor on the Scientific Computing Committee, may omit this course from their curriculum. Students develop their course of study with two faculty: one from the student's home department and the other a member of the Graduate Committee on Scientific Computing from outside the student's home department. The proposed course of study will be submitted for approval by the Graduate Committee on Scientific Computing. If approved, a letter detailing the course of study will be signed by the committee chair with copies given to the student and the student's home department. Significant changes to the course of study need to undergo the same process of development and approval. Certification of completion of the minor requirements will be by the committee chair or an appointed representative.

Courses

Courses that can be used to satisfy the Scientific Computing minor requirement include, but are not limited to, the following list:

A550 (Astronomy), A570 (Astronomy), B673 (CSCI), B582 (CSCI), P573 (CSCI), C668 (Chemistry), P410 (Physics), P609 (Physics), P700 (Physics), M571 (Mathematics), M572 (Mathematics), G612 (Geological Sciences), G514 (Geological Sciences), and G614 (Geological Sciences).