

INDIANA UNIVERSITY

University Graduate School
2005-2006
Academic Bulletin

Informatics

School of Informatics
Indianapolis

Associate Director

Snehasis Mukhopadhyay*

Graduate Faculty

(An asterisk [*] denotes membership in the University Graduate School faculty with the endorsement to direct doctoral dissertations.)

Professors

Yue Chen*, Keith Dunker*, Ariel Fernandez, Sara Anne Hook, Steven Mannheimer, Douglas G. Perry, Narayanan Perumal*

Associate Professors

M. Pauline Baker, Chung-Kou Chang, Garland C. Elmore, Anthony Faiola, Edgar Shaohua Huang, Mahesh H. Merchant, Samuel Milosevich, Gunther Schadow, Durwin Sarmiento Talon

Assistant Professor

Daniel Louis Baldwin, Jake Chen, Joseph Michael Defazio, Jeffrey Huang, Pedro Rafael Romero

Academic Advisor

Ph.D. Minor in Bioinformatics

Bioinformatics gathers knowledge and information from various fields such as informatics, chemistry, computer science, medicine, and biology. Students in relevant Ph.D. programs such as biochemistry and molecular biology, medical and molecular genetics, medicine, chemistry, or biology are the target audience for the Ph.D. minor in bioinformatics.

A minor in bioinformatics requires 12 credit hours. The core curriculum consists of graduate-level courses in informatics. Electives may be chosen based on personal interests from a broad list of courses in biology, chemistry, computer science, information science, and medical and molecular genetics.

Requirements

The graduate bioinformatics courses in the School of Informatics assume a minimal knowledge of cell and molecular biology. That level of understanding could be gained with at least 6 undergraduate credit hours in molecular biology, genetics, or evolution.

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Courses

Core Courses

INFO I500 Fundamental Computer Concepts for Informatics (3 cr.)

INFO I501 Introduction to Informatics (3 cr.)

INFO I502 Information Management (3 cr.)

INFO I505 Informatics Project Management (3 cr.)

INFO I510 Data Acquisition and Laboratory Automation (3 cr.)

INFO I511 Laboratory Information Management Systems (LIMS) (3 cr.)

INFO I512 Scientific Data Management and Analysis (3 cr.)

INFO I531 Seminar in Health Informatics (1-3 cr.) Variable topic. Emphasis is on advanced topics and research in health informatics. Can be repeated with different topics, subject to approval of the Dean.

INFO I532 Seminar in Bioinformatics (1-3 cr.) Variable topic. Emphasis is on advanced topics and research in bioinformatics. Can be repeated with different topics, subject to approval of the Dean.

INFO I533 Seminar in Chemical Informatics (1-3 cr.) Variable topic. Emphasis is on advanced topics and research in chemical informatics. Can be repeated with different topics, subject to approval of the Dean.

INFO I534 Seminar in Human-Computer Interaction (1-3 cr.) P: Graduate Standing. Variable topic. Emphasis is on advanced topics and research in human-computer interaction. Can be repeated with different topics, subject to approval of Dean.

INFO I535 Clinical Information Systems (3 cr.)

INFO I540 Data Mining for Security (3 cr.)

INFO I550 Legal and Business Issues in Informatics (3cr.)

INFO I571 Chemical Information Technology (3 cr.) P: Consent of Instructor. Overview of chemical informatics techniques, including: chemical structure coding, chemical data representation, chemical database and search systems, molecular visualization and modeling techniques, and the development of chemical informatics software.

INFO I572 Computational Chemistry and Molecular Modeling (3 cr.) P: INFO-I571. Computer models of molecules and their behavior in gas and condensed phases; implicit and explicit solvation models; quantum and molecular mechanics; search strategies for conformational analysis, geometry optimization methods; information content from Monte Carlo and molecular dynamics simulations; QSAR; CoMFA; docking.

INFO I575 Informatics Research Design (3 cr.)

INFO I576 Structural Approaches to Systems Biology (3 cr.) Computational approaches to characterizing and predicting tertiary protein configuration, based on known data of atomic, intramolecular and intermolecular interactions.

INFO I590 Topics in Informatics (1-3 cr.) Graduate standing. Variable topic. Emphasis is on new developments and research in informatics. Can be repeated with different topics, subject to approval of the Dean.

Required Graduate Courses**CSCI 548 Introduction to Bioinformatics (3 cr.)****Electives**

A student's committee, working in conjunction with an Informatics committee designated to oversee the minor, will decide what elective courses are appropriate for a given student.

Required Graduate Courses

NEWM N500 Foundations of Digital Arts Production (3 cr.) This course examines issues related to digital media communication in the context of e-commerce and the information industry, especially its impact on the cultural, economic, social, and ethical dimensions of local and global communities. Topics also include usability, intellectual property, and a diversity of user markets for new media products.

NEWM N501 Topic: Foundations of Digital Arts Production (3 cr.) This course examines the production process and management of digital multimedia. Students investigate and produce projects by researching foundations in the use of digital video with special emphasis on production process of storytelling. Skills learned will include project development and video production. Students will develop presentation skills through research papers.