INFORMATICS

An interdisciplinary major at the University of Michigan

Three University of Michigan colleges/schools created and launched a new undergraduate concentration in Informatics in fall 2008. The planning phase of the program was supported by a generous grant from the Provost's Multidisciplinary Learning and Team Teaching Initiative. The program is a multidisciplinary collaboration among faculty from the LSA Departments of Statistics and Mathematics, the School of Information, and the CoE Computer Science & Engineering Division. It is based in LSA.

The new program has been in place for one academic year, and is on track for the first cadre of Informatics concentrators to graduate in the 2009-10 academic year. Thirty-five students are currently enrolled in the program. Informatics has four tracks: Computational Informatics; Data Mining and Information Analysis; Life Science Informatics; Social Computing. The program requires 44 credit hours for completion, including a core curriculum of four highly complementary courses (16 credits), three to five courses in one of four flexible program tracks (between 11 and 18 credits), and concentration electives selected from a list of recommended courses (between 10 and 17 credits).

What is Informatics?
Informatics is the study of how human and technical information processing systems are used to understand and gain meaning from data. Students in the informatics concentration learn to use computational and mathematical tools in a cognitive and social framework to analyze, represent, and communicate information. Upon completing the concentration, students will be able to critically analyze various approaches to processing information, and will have the skills to help design, implement, and evaluate information technology tools for specific scientific, business, and cultural needs.

Accomplishments, 2008-09

LSA Integration: We have developed effective working relationships with key University and College units and programs, including the Office of Undergraduate Admissions (OUA), LSA Recruitment; the Center for Educational Outreach (CEO), the Business Engagement Center (BEC), the Career Center, the School of Information's Career Services, LSA Advising, Engineering Advising, and Michigan Learning Communities (MLCs). Our goals are first to introduce informatics as a word and an academic discipline and second to form complementary working relationships with these and other units and programs. Our efforts have been met with interest and enthusiasm. Informatics is enjoying increasing faculty and staff support in all three schools. As the program grows, we intend to deepen our existing campus relationships and reach out to additional programs and units.

Student Recruiting: In addition, in the interest of meeting our target of 12-15 concentrators in the first academic year, we purchased Diag Banner and Diag Board advertising, sent email announcements, placed posters and flyers in residence halls, academic and community buildings on Central and North

Campuses, participated in the 2008 and 2009 LSA Concentration Fairs, and held group information sessions and numerous individual student meetings. In addition to on campus recruiting, we joined OUA's team of admissions staff at a number of recruitment events in Detroit area high schools.

Our first year enrollment figures exceeded our expectations. Thirty-five students have declared the concentration. All four tracks have students enrolled, with Social Computing being the most popular to date. The student group is well balanced by gender (16 female, 19 male), which is one of the primary goals of the program. Students maintain a median GPA of 3.22. Informatics may turn out to be a popular choice for dual concentration; already one-third of Informatics concentrators are also pursuing a second concentration, distributed across fields as economics, business, English, and biology.

Curriculum Development and Modification: The full Informatics curriculum design was approved by the three participating schools, the LSA Curriculum Committee, the LSA Executive Committee, and the Presidents' Council of the State Universities of Michigan. The concentration was successfully launched at the beginning of the Fall 2008 term. Ten new courses have been developed for the concentration.

W08	EECS/SI 182	Building Applications for Information Environments (Prereq)
W09	EECS 282	Programming, Data Structures, & Databases (Core)
TBD	EECS 476	Theory of Internet Applications (Track/Elective)
W09	SI 301	Models of Social Information Processing (Track/Elective)
W09	SI 422	Evaluation of Systems and Services (Track/Elective)
F09	SI 410	Ethics and Information Technology (Core)
F09	SI 446	Personal Privacy: Policy, Practice and Technology Issues (Elective)
TBD	SI 330	Security of Digital Systems (Elective)
W08	STATS 415	Data Mining and Statistical Learning (Track)
F08	STATS 403	Introduction to Quantitative Research Methods (Core)

Modifications have been made to the originally outlined organization of core, track, and elective courses throughout the year.

The Informatics concentration has taken an active team-based approach to curriculum development, although none of the individual courses is team-taught. For example, EECS/SI 182 Building Applications for Information Environments, was designed by faculty from the School of Information and the College of Engineering, is taught in alternating years by faculty from the two schools, and is jointly evaluated. SI 410 Ethics and Information Technology has been similarly co-developed; the course's modular design supports teaching of the fundamental intellectual content by faculty from multiple schools. The Center for Research on Learning and Technology has assisted through the year in both the design and the evaluation of select Informatics courses.

In response to the unequal distribution of students across the four tracks of study, the curricula for two tracks are being adjusted. For the Data Mining & Information Analysis track, a slightly different balance of track and elective courses will be put in place for the 2009-10 academic year. For the Life Science Informatics track, we have proposed a new mix of life science and computational/quantitative courses, so that the Informatics concentration is more clearly distinguishable from certain undergraduate

biology concentrations. We are also considering the ways for Informatics concentrators to satisfy the LSA Upper Level Writing Requirement, the addition of an Honors program, and mechanisms for accommodating practical internships.

Governance: The Informatics concentration is based in LSA but is jointly administered by faculty from the three colleges/schools. A formal governance structure is now in place to support this innovative educational model. A six member committee of faculty oversees curriculum development, student recruiting and advising, and intra-school communication. This Faculty Steering Committee is appointed by and reports to a Governing Board that is comprised of designates of the Deans of the participating schools and is responsible for the long-term welfare and oversight of the program.

Student Feedback

The results of a student-designed and administered survey of three newly developed courses indicates that students are, indeed, developing the necessary skills to master interdisciplinary modes of academic thought. Synopses from the survey include the following:

> *"...students commented on valuable skills gained from taking EECS 282, such as the ability to independently understand the Java API, sort/interpret large quantities of data, create simple games, manipulate text and debug/test programs."*
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> *"Students were extremely confident that the knowledge and skills acquired from SI 301 would assist them greatly in the future, both in life and their careers. Almost all of the students mentioned the course concept of "Wisdom of Crowds" and how eye opening and applicable to real life they found it to be. The detailed coverage of Networks throughout the semester was also highly retained by the students of SI 301."*
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> *"Most responses indicated that in addition to learning how to properly write formal reports to illustrate findings, students became more aware of the importance and effectiveness of testing and evaluation in the real world. Students who plan on pursuing a career in software and/or website development found the concepts taught in SI 422 to be particularly valuable."*

Informatics Faculty Steering Committee, 2009-2010

- Kerby Shedden, Associate Professor, Department of Statistics, LSA, chair
- Paul Conway, Associate Professor, School of Information
- Anna Gilbert, Associate Professor, Department of Mathematics, LSA
- H. V. Jagadish, Professor, Computer Science & Engineering, CoE
- Atul Prakash, Professor, Computer Science & Engineering, CoE
- Charles Severance, Clinical Assistant Professor, School of Information
- Meghan Genovese, Program Manager, Department of Statistics, LSA, ex officio

Informatics Governing Board, 2009-10

- Farnam Jahanian, Chair, CSE Division, College of Engineering
- Jeffrey MacKie-Mason, Associate Dean, School of Information
- Vijay Nair, Chair, Department of Statistics, LSA