Department of Informatics

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Overview

Our world runs on information, with more and more aspects of daily life having information technologies and digital systems at their core. Topics such as open-source software, virtual organizations, online political campaigns, digital television, social media, and computer games need to be understood and advanced from both a technical and human perspective simultaneously.

This is what Informatics does.

We seek to make a positive difference in how people live, work and build in a digital world. To that end, we study interactions among information technologies and people, create innovative information technologies that serve the diverse needs of society, and educate our students to be leaders in these endeavors.

Our work is shaped by four key values:

- **Creativity**. We create new technologies, new experiences, and new ways of understanding. We believe that information technology provides a rich platform for expression, from programming environments to digital media, and creative arts.
- **Engagement**. We focus on real-world concerns, with a strong empirical focus and a commitment to understanding and advancing technology in real life, around the world.
- **Interdisciplinarity**. We use knowledge and methods from multiple disciplines to study and improve the relationships among people, information, and technology from a holistic perspective.
- **Partnership**. We build relationships across campus and beyond, partnering with other schools and educational institutions; with corporations and technology providers; with civic agencies and nonprofits; and with consumers, advocates, and interest groups to locate novel and important contexts for conducting and applying our work.

These values help us deliver results that matter. Our research has, as just a few examples, resulted in technology that improves the early diagnosis of cerebral palsy in preterm babies; in apps that help kids with autism spectrum disorder live fuller lives; and in new tools that assist software developers in locating and fixing bugs — real results that make a difference every day.

Our values similarly define the nature of our teaching. Our students' experience is not confined to campus. Instead, they are constantly exposed to the real world, the issues at play, and the possibilities of information technology making a difference. For instance, students in our capstone design course have designed a customizable Analytics dashboard for Google; a new web portal for the Down Syndrome Foundation; an at-home energy saving recommender for Edison; a mobile application to capture statistical data related to clinical cases for the UC Irvine Medical Center; and a freelance game in which a mystical fish has to protect its aquatic environment.

Our constant work with the surrounding community is another natural outgrowth of our values. We benefit significantly from our relationships with corporations, technology providers, civic agencies, and nonprofits, to name a few. These partners serve as field sites for our studies, perform trial deployments of new technology we develop, and support students' class projects. Google, IBM, Intel, Microsoft, Raytheon, Northrup Grumman, Boeing, Children's Hospital of Orange County, Disney, Boeing, Nokia, Mirth, HP, Accenture, and Hitachi represent just a sample of our long list of partners.

Our research takes us beyond individual partners as well, frequently studying the interplay of people, information, and technology in particular communities or societies. Our students and faculty, for instance, have engaged in extended field observations in Australia, Hong Kong, China, Korea, Thailand, India, Zambia, South Africa, China, and other locales.

We encourage you to explore our website (http://www.informatics.uci.edu) for additional examples of the many projects in which we are engaged, and to find out how you can become involved in making a positive difference. These are exciting times, and we would love to partner!

Undergraduate Major in Informatics

Want to learn how to design better user interfaces? Curious to learn how to observe people when they use information technology and how to turn your findings into innovative products? Wondering how evolving privacy laws affect the design of software worldwide? Care about helping people in need with smart apps? Interested in learning how organizations work and how information technology can support their practices?

If you answered yes to one or more of these questions, UC Irvine's Informatics major just might be the choice for you.

The B.S. in Informatics is designed around a small set of core courses that introduce the fundamentals of Informatics (human computer interaction, design), software (programming, requirements analysis), and human behavior (social analysis of computerization). From there, three specializations —human-computer interaction, health informatics, and organizations and information technology — enable students to focus their learning with more

than three dozen courses from which they can choose. The major is inherently interdisciplinary, with courses ranging from sociology and psychology to management and public health, depending on the specialization chosen.

Throughout the major, a variety of project courses offer students hands-on experiences in creative design practices, app development, ethnography, information management, business IT, and other topics. You learn how to apply your skills in different domains and work in different teams, culminating in a two-quarter capstone course in which you engage in a real-world project sponsored by a company or organization outside the university.

Overall, the major strongly emphasizes people and design; building an understanding of how existing technologies shape human behavior, society, and culture; and how we can design future technologies that better fit human and organizational practices. Given the fluid nature of people's expectations for information technology and what tomorrow's technology can offer, students learn how to adapt to the continuous new circumstances of the profession — whether it is a new client and their habits, an emerging new device or software capability, or a new team and its practices.

Informatics majors complete one of four specializations: Human-Computer Interaction (HCI), Organizations and Information Technology (OIT), Health Informatics (HI), or Specialization in Individual Studies. More information is available at the Department of Informatics website (http://www.informatics.uci.edu/undergrad/bs-informatics).

Admissions

Freshmen Applicants: See the Undergraduate Admissions section.

Transfer Applicants:

Students transferring into the major must satisfy the following requirements:

1. Completion of one college-level mathematics course; courses equivalent to I&C SCI 6B Boolean Algebra and Logic , STATS 7 Basic Statistics or STATS 67 Introduction to Probability and Statistics for Computer Science are preferred as these courses facilitate scheduling after transfer to UCI.
2. Completion of one year of transferable computer science courses involving concepts such as those found in Java, Python, C++, data structures, or other object-oriented or high-level programming language.

NOTES: 1. The introductory sequence in ICS is offered in Python. The Bren School of ICS strongly encourages all participants to become familiar with this programming language prior to matriculation. Additional computer science courses beyond the two required are strongly recommended, particularly those that align with the major(s) of interest. Java is used extensively in the curriculum; therefore, transfer students should plan to learn it by studying on their own or by completing a Java-related programming course prior to their first quarter at UCI. 2. It is recommended that students meet the articulation agreement on Assist.org (http://www.assist.org/web-assist/welcome.html) between their community colleges and this major at UC Irvine. This will allow them to make efficient progress toward the major.

Additional courses beyond those required for admission must be taken to fulfill the lower-division degree requirements, as many are prerequisites for upper-division courses. For some transfer students, this may mean that it will take longer than two years to complete their degree.

More information is available at Department of Informatics website (http://www.ics.uci.edu/informatics/ugrad) or at the ICS Student Affairs Office; telephone 949-824-5156; email: ucounsel@uci.edu.

Major and Minor Restrictions

Bren School of ICS majors (including shared majors, BIM, and CSE) pursuing minors within the Bren School of ICS may not count more than five courses toward both the major and minor. Some ICS majors and minors outside of the School are not permitted due to significant overlap. Visit the ICS Student Affairs Office website for Majors and Minors restrictions. (http://www.ics.uci.edu/ugrad/degrees/MajorMinor_Restrictions_Chart.pdf) All students should check the Double Major Restrictions Chart (http://www.ics.uci.edu/ugrad/degrees/Dbl_Major_Restr_Chart.pdf) and view our information page (http://www.ics.uci.edu/ugrad/degrees/Double_Majors.php) on double majoring to see what degree programs are eligible for double majoring.

Requirements for the B.S. in Informatics

All students must meet the University Requirements.

Major Requirements

Lower-division

A. Complete:	
I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
I&C SCI 45J	Programming in Java as a Second Language
I&C SCI 90	New Students Seminar
IN4MATX 43	Introduction to Software Engineering
I&C SCI 6B	Boolean Algebra and Logic
STATS 7	Basic Statistics

or STATS 67	Introduction to Probability and Statistics for Computer Science
Upper-division	
A. Informatics Core Requirements:	
IN4MATX 113	Requirements Analysis and Engineering
IN4MATX 121	Software Design: Applications
IN4MATX 131	Human Computer Interaction
IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 191A- 191B	Senior Design Project and Senior Design Project
B. One of the following specializations:	
1. Specialization in Human-Computer Interaction	
Complete:	
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
and select three of the following:	
IN4MATX 133	User Interaction Software
IN4MATX 141	Information Retrieval
IN4MATX 143	Information Visualization
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 162W	Organizational Information Systems
IN4MATX 171	Introduction to Medical Informatics
and select two project courses from the following:	
IN4MATX 125	Computer Game Development
IN4MATX 134	Project in User Interaction Software
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
IN4MATX 172	Project in Health Informatics
and select four additional courses from the following:	
IN4MATX 100–190	
2. Specialization in Organizations and Information Technology	
Complete:	
IN4MATX 141	Information Retrieval
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
MGMT 5	Management of Contemporary Organizations
MGMT 102	Managing Organizational Behavior
and select four of the following:	
MGMT 107	Introduction to Management Information Systems
MGMT 173	Business Intelligence for Analytical Decisions
MGMT 178	Management of Information Technology
PSY BEH 9	Introduction to Psychology
PSY BEH 104S	Social Animal: An Introduction to Social Psychology
PSY BEH 176S	Motivation
SOCIOL 41	Small Group Dynamics
SOCIOL 135	Social Psychology of Networks
SOCIOL 141	Organizations
SOCIOL 143	Social Networks and Social Support
SOCIOL 145	Occupations and Professions
IN4MATX 100–190	
and select two additional courses from the following:	
IN4MATX 100–190	
COMPSCI 100–199	

3. Specialization in Health Informatics	
Complete the following:	
IN4MATX 171	Introduction to Medical Informatics
IN4MATX 172	Project in Health Informatics
Select four from the following:	
IN4MATX 123	Software Architecture
IN4MATX 124	Internet Applications Engineering
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 133	User Interaction Software
IN4MATX 134	Project in User Interaction Software
IN4MATX 141	Information Retrieval
IN4MATX 143	Information Visualization
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 153	Computer Supported Cooperative Work
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
COMPSCI 111	Digital Image Processing
COMPSCI 122A	Introduction to Data Management
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 134	Computer and Network Security
COMPSCI 145- 145L	Embedded Software and Embedded Software Laboratory
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
and select two courses from the following:	
NUR SCI 110W	Frameworks for Professional Nursing Practice
PUBHLTH 101	Introduction to Epidemiology
PUBHLTH 104	Analytic and Applied Epidemiology
PUBHLTH 122	Health Policy
PUBHLTH 124	Environmental and Public Health Policy
and select two additional courses from the following:	
IN4MATX 100-199	
COMPSCI 100-199	
PUBHLTH 100-199	
4. Specialization in Individual Studies [1]	

[1] Informatics majors must complete a detailed proposal to apply for this specialization. All candidates must meet the following minimum qualifications for consideration:

- UCI transcript demonstrating at least 3.0 UC GPA.
- Completion of at least 46 units or sophomore standing at UC Irvine.

Proposals must include the following:

- Syllabi and/or course descriptions of intended coursework
- Academic plan demonstrating completion of 40 units of credit that significantly complements the core Informatics courses to create a coherent curriculum focused on studying some aspect of living, working, and building in a digital world.
- Students entering as freshmen should plan to submit their proposals no later than the beginning of spring quarter of the freshman year. Students entering as transfers must submit their proposals no later than the beginning of spring quarter of their first year at UCI.
- Students must submit their approval proposals to the ICS Student Affairs no later than two weeks after receiving a signature.

All proposals are to be submitted to the Department of Informatics' Undergraduate Vice Chair for approval. Failure to receive approval will require majors to choose another specialization for the major. Information about the Department of Informatics can be found at Informatics.uci.edu.

Sample Program of Study — Informatics: Health Informatics (HI)

Freshman		
Fall	**Winter**	**Spring**
I&C SCI 31	I&C SCI 32	I&C SCI 33
I&C SCI 90	I&C SCI 6B	IN4MATX 43

STATS 7	WRITING 39B	WRITING 39C
WRITING 39A		
Sophomore		
Fall	**Winter**	**Spring**
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 121	IN4MATX 131	General Education III
IN4MATX 161	U-D Writing	General Education IV
	General Education III	
Junior		
Fall	**Winter**	**Spring**
Specialization	IN4MATX 151	Specialization
Specialization	Specialization	Specialization
General Education III	General Education IV	General Education VI
Senior		
Fall	**Winter**	**Spring**
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	Specialization
General Education IV	General Education VII	General Education VIII

Sample Program of Study — Informatics: Human-Computer Interaction (HCI)

Freshman		
Fall	**Winter**	**Spring**
I&C SCI 31	I&C SCI 32	I&C SCI 33
STATS 7	I&C SCI 6B	IN4MATX 43
WRITING 39A	WRITING 39B	WRITING 39C
I&C SCI 90		
Sophomore		
Fall	**Winter**	**Spring**
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 161	IN4MATX 131	General Education III
Specialization	General Education IV	General Education IV
Junior		
Fall	**Winter**	**Spring**
IN4MATX 121	IN4MATX 151	Specialization
Specialization	Specialization	General Education III
General Education III	U-D Writing	General Education VI
Senior		
Fall	**Winter**	**Spring**
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	Specialization
General Education IV	General Education VII	General Education VIII

Sample Program of Study — Informatics: Organizations and Information Technology (OIT)

Freshman		
Fall	**Winter**	**Spring**
I&C SCI 31	I&C SCI 32	I&C SCI 33
STATS 7	I&C SCI 6B	IN4MATX 43
WRITING 39A	WRITING 39B	WRITING 39C
I&C SCI 90		
Sophomore		
Fall	**Winter**	**Spring**
I&C SCI 45J	IN4MATX 113	Specialization
IN4MATX 161	IN4MATX 131	General Education III
Specialization	General Education III	General Education IV
	General Education IV	
Junior		
Fall	**Winter**	**Spring**
IN4MATX 121	IN4MATX 151	Specialization
Specialization	Specialization	Specialization
General Education III	U-D Writing	General Education VI

Senior		
Fall	**Winter**	**Spring**
IN4MATX 191A	IN4MATX 191B	Specialization
Specialization	Specialization	General Education IV
General Education VII	Specialization	General Education VIII

Minor in Digital Information Systems

The minor in digital information systems is designed for students who want to learn about information systems and their role in business, without preparing to be computer programmers. Many businesses, whether commerce- or service-oriented, are now driven by the information their IT systems capture about customers, their habits, and relevant aspects of the business. Students completing the digital information systems minor learn about the "why" of digital information systems, the technological underpinnings of these systems, and constraints on their design and use.

The minor is ideally suited for students in programs such as business administration, economics, civil engineering or urban studies, where digital information systems are essential to the primary task at hand.

The minor includes course work covering the opportunities and limitations of digital information systems, their design and advanced topics such as information retrieval and visualization. Students completing the minor will gain practical experience designing digital information systems and their interfaces in a variety of different domains.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. While it is possible to enroll in more technical classes, it is also possible to complete the minor without taking courses in programming.

Requirements for the Minor in Digital Information Systems

A. Select two of the following:	
I&C SCI 3	Internet Technologies and their Social Impact
I&C SCI 4	Human Factors for the Web
I&C SCI 5	Global Disruption and Information Technology
I&C SCI 7	Introducing Modern Computational Tools
I&C SCI 11	The Internet and Public Policy
I&C SCI 32	Programming with Software Libraries
IN4MATX 43	Introduction to Software Engineering [1]
I&C SCI 61	Game Systems and Design
B. Select one of the following:	
I&C SCI 10	How Computers Work
I&C SCI 31	Introduction to Programming
C. Select four of the following:	
I&C SCI 105	Digital Information Systems [1]
IN4MATX 131	Human Computer Interaction
IN4MATX 132	Project in Human-Computer Interaction Requirements and Evaluation
IN4MATX 143	Information Visualization
IN4MATX 148	Project in Ubiquitous Computing
IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 162W	Organizational Information Systems
IN4MATX 163	Project in the Social and Organizational Impacts of Computing
IN4MATX 171	Introduction to Medical Informatics
IN4MATX 172	Project in Health Informatics

[1] Students cannot take both IN4MATX 43 and I&C SCI 105.

NOTE: Bren School of ICS majors may not minor in Digital Information Systems. Courses used to complete the minor in Digital Information Systems may not also count toward the requirements for the Information and Computer Science minor or the Informatics minor.

Minor in Health Informatics

The minor in health informatics prepares students to understand the expanding role of information technology in health care. Doctors, nurses, public health officials, and administrators all interact with information technology and, at times, are intimately involved in the design of information technology solutions to health care issues. Students in the minor learn about the possibilities and limitations of information technology, how its use is changing the

health care profession, and how the design of information technology must be performed principally with the users and a range of domain considerations in mind.

The minor is ideally suited for students in programs such as nursing science, public health sciences, and pharmaceutical sciences, as well as students in Bren School majors who wish to gain strong exposure to the domain of health informatics.

The minor includes course work and fieldwork covering a variety of health care settings, including the hospital, doctor's office, and home care. Students completing the minor will gain practical experience in understanding the health care needs of communities and individuals, and in designing information technology solutions that serve them better.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. While it is possible to enroll in more technical classes, it is also possible to complete the minor without taking courses in programming.

Requirements for the Minor in Health Informatics

A. Complete:	
IN4MATX 171	Introduction to Medical Informatics
IN4MATX 172	Project in Health Informatics
B. Select two of the following:	
I&C SCI 4	Human Factors for the Web [1]
I&C SCI 7	Introducing Modern Computational Tools [1]
I&C SCI 10	How Computers Work [1]
I&C SCI 31	Introduction to Programming [1]
I&C SCI 32	Programming with Software Libraries [1]
IN4MATX 121	Software Design: Applications
IN4MATX 123	Software Architecture
IN4MATX 131	Human Computer Interaction
IN4MATX 133	User Interaction Software
IN4MATX 143	Information Visualization
COMPSCI 111	Digital Image Processing
COMPSCI 121/IN4MATX 141	Information Retrieval
COMPSCI 122A	Introduction to Data Management
COMPSCI 131	Parallel and Distributed Computing
COMPSCI 134	Computer and Network Security
COMPSCI 145	Embedded Software
COMPSCI 171	Introduction to Artificial Intelligence
COMPSCI 178	Machine Learning and Data-Mining
C. Select two of the following:	
NUR SCI 110W	Frameworks for Professional Nursing Practice
PUBHLTH 101	Introduction to Epidemiology
PUBHLTH 104	Analytic and Applied Epidemiology
PUBHLTH 122	Health Policy
PUBHLTH 124	Environmental and Public Health Policy
D. Select one of the following:	
IN4MATX 151	Project Management
IN4MATX 161	Social Analysis of Computing
IN4MATX 162W	Organizational Information Systems
STATS 7	Basic Statistics
STATS 8	Introduction to Biological Statistics
STATS 67	Introduction to Probability and Statistics for Computer Science

[1] This course may only be counted by majors outside of the Bren School of ICS.

NOTE: A student must earn a grade of C or better in all courses used to satisfy the requirements of this minor.

Minor in Informatics

The minor in informatics prepares students to understand the relationship between information technology and people. The finance, movie, journalism, and pharmaceutical industries are just a few examples of where the use of innovative information technology has radically changed our world, in terms of what is now possible, how humans perform their jobs, and how society has critically reacted and adapted to new realities brought forth by information technology use. Students in the minor learn how existing technologies shape human behavior, society and culture, and are introduced to techniques that will enable them to design future technologies that better fit human and organizational practices.

The minor is ideally suited for students in programs such as film and media studies, education sciences or social policy, and public service, where information technology is an integral part of the profession, but not necessarily the primary focus.

The minor includes course work covering a variety of topics, including programming, software engineering, human computer interaction, and social analysis of computerization. Students completing the minor will gain practical experience in designing and building small software systems, creating novel user interfaces, and examining how information technology affects those around it.

The minor offers flexibility in the courses that students choose to take, and does not require prior programming experience. The minor does have a technical underpinning, however, with core courses that teach students how to program software.

Requirements for the Minor in Informatics

A. Complete:

I&C SCI 31- 32- 33	Introduction to Programming and Programming with Software Libraries and Intermediate Programming
IN4MATX 43	Introduction to Software Engineering
IN4MATX 131	Human Computer Interaction
IN4MATX 161	Social Analysis of Computing
and at least two additional upper-division courses in Informatics.	

NOTE: A maximum of two courses can be taken Pass/Not Pass toward a minor. Bren School majors should refer to the Majors/Minors Restrictions *Catalogue* section before attempting to minor in Digital Information Systems, Health Informatics, or Informatics. Students who are considering a major in Informatics must complete the major requirements for a letter grade.

Graduate Programs in the Department of Informatics

The Department of Informatics offers a number of graduate programs:

* A Ph.D. and M.S. in Informatics, both of which are research-oriented in applying a variety of technical and social approaches to understand fundamental human and digital experiences and to design transformative solutions to a variety of human, organizational, and social challenges.

* A Ph.D. and M.S. in Software Engineering, both of which are research oriented in studying complex software systems and the people that create them through the analysis of current practices by which software is designed and developed and the exploration of new methods, tools, approaches, and techniques to improve our ability to do so.

* A Master of Human Computer Interaction and Design, which is practice oriented and prepares students to apply a variety of empirical, design, and technological approaches to understanding and designing for a wide variety of user experiences.

Admission to Graduate Programs in Informatics

Students applying to the program may have degrees in any field, though preference will generally be given to those with a technical or social science background.

Master of Human Computer Interaction and Design

The Master of Human Computer Interaction and Design (M.H.C.I.D.) prepares students to apply a variety of empirical, design, and technological approaches to understanding and designing for a wide variety of user experiences. The Master of Human Computer Interaction and Design is an interdisciplinary degree program that provides deep knowledge of social science, computer science, and design. Students learn core knowledge in programming, design, and human computer interaction methods.

During the final two quarters, students participate in a capstone project and prepare portfolios representing their work. The capstone project is collaborative, facilitated by the three in-person periods of study in the program. At the completion of this program, students are able to lead and collaborate in the design, implementation, and evaluation of useful and usable technologies. They are well prepared to contribute to the multi-disciplinary teams that typically construct user experiences, software, technical systems, and human-computer interfaces. They are knowledgeable about the

techniques for building successful user interfaces, the design principles that make user interfaces visually clear and appealing, and the techniques for identifying needs for software, its success, and the people and organizations that use their systems.

Admission

Applicants are evaluated on the basis of their prior academic record and letters of reference from people either in the student's academic history or work settings. Students applying to the program may have degrees in any field, though preference is generally given to those with a technical, social science, or design background and those with work experience. All applicants are evaluated on the materials submitted: letters of recommendation, official college transcripts, and personal statement. Applicants are strongly encouraged to additionally submit either official GRE test scores or a relevant work portfolio. For more information, contact the ICS graduate counselor at 949-824-5156 or gcounsel@ics.uci.edu (gcounsel@ics.uci.edu).

Requirements

All Master of Human Computer Interaction and Design students are expected to maintain a minimum GPA of 3.0 throughout the program, with no individual grade lower than a B-.

A. Complete the following:

IN4MATX 280	Overview of Human-Computer Interaction and Design
IN4MATX 281	User Needs Analysis
IN4MATX 282	Design and Prototyping
IN4MATX 283	User Experience Evaluation
IN4MATX 284	Advanced Design and Prototyping
IN4MATX 285	Interactive Technology Studio
IN4MATX 286	Innovations in HCI and Design
IN4MATX 287	Capstone Project in HCI and Design
IN4MATX 288	Capstone Project and Portfolio

The final examination for the M.H.C.I.D. includes three components: 1) Performance on a capstone project that incorporates skills and knowledge from the entire program; 2) Individual and peer evaluations of performance within the capstone project team; and 3) Assessment of a completed portfolio.

Students making normal progress are expected to complete the degree program in approximately 12 months. A guide to sensible program completion in two years is provided, but the 12-month completion time is recommended.

Informatics

Master of Science in Informatics

The M.S. program in Informatics prepares students to apply a variety of technical and social approaches to understand fundamental human and digital experiences, and to design transformative solutions to a variety of human, organizational, and social challenges. A fundamental focus of the research is a dual view of information technology – as a technical object and as a cultural object. From a technical perspective, we are concerned with the design and analysis of advanced information technologies and digital media. But we also understand these as objects that embody social values, shape human experiences, and carry cultural meaning. Our interests lie in the relationship between these two aspects of interactive technology.

The M.S. in Informatics incorporates four connected emphases:

1. An empirical focus that emphasizes understanding of technology design and use in practice.
2. A theoretical focus aimed at understanding contexts of information system use.
3. A technological focus aimed at new capabilities and infrastructures.
4. A design focus that includes integrative and holistic consideration of technical and human considerations.

Students engage with multiple stakeholders, including faculty and researchers in other disciplines, major corporations and entrepreneurial enterprises, governmental and non-governmental agencies, and volunteer organizations such as open source communities. Through our involvement with these organizations, our research connects to the world beyond the university.

Requirements

Students must complete courses, including a research methods core, and research experience courses related to their final thesis. Students must maintain satisfactory academic progress according to the requirements of the program as maintained by the faculty and posted publicly.

A. Complete the following:

Core Courses	
IN4MATX 261	Social Analysis of Computing
IN4MATX 232	Research in Human-Centered Computing
IN4MATX 209S	Seminar in Informatics (twice, usually in the first year)

B. Complete the following:	
Research Methods Core	
IN4MATX 201	Research Methodology for Informatics
IN4MATX 203	Qualitative Research Methods in Information Systems
IN4MATX 205	Quantitative Research Methods in Information Systems
C. Complete two quarters of IN4MATX 298. [1]	
D. Select six graduate-level electives. [2]	

1 To coincide with the completion of the M.S. thesis.

2 The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor. Although the courses may be chosen from any graduate-level courses on campus, it is recommended that at least three be chosen from within the School of Information and Computer Sciences. At most, 12 units of IN4MATX 298 and IN4MATX 299 may be used as electives.

Final Examination

Plan One

The M.S. thesis defense committee is formed in accordance to UCI Senate regulations. This committee must approve the following for the student to pass the final examination:

Thesis document: The student must prepare the written dissertation in accordance with Academic Senate regulations and present this document to the committee with enough advance notice for appropriate review and critique prior to an oral defense. Following an oral defense of this document, any changes required must be approved by the entire committee.

Oral defense: The student must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. To ensure the public has an opportunity to participate in this examination, the student must announce the defense title, date, and time at least two weeks prior to the event to all faculty and doctoral students in the department.

Plan Two

In the final quarter of study, the student must take a comprehensive examination given by Informatics faculty. The examination covers the core requirements.

Students transferring from the Ph.D. program in Informatics to the M.S. program in Informatics who pass the Ph.D. Advancement exam at a Master's level may substitute that exam for the comprehensive exam.

Doctor of Philosophy in Informatics

The Ph.D. in Informatics prepares students to apply a variety of technical and social approaches to understand fundamental human and digital experiences and to design transformative solutions to a variety of human, organizational, and social challenges. A fundamental focus of our research is a dual view of information technology -- as a technical object and as a cultural object. From a technical perspective, we are concerned with the design and analysis of advanced information technologies and digital media. But we understand these too as objects that embody social values, shape human experiences, and carry cultural meaning. Our interests lie in the relationship between these two aspects of interactive technology.

The Ph.D. in Informatics incorporates four connected emphases: an empirical focus that emphasizes understanding of technology design and use in practice; a theoretical focus aimed at understanding contexts of information system use; a technological focus aimed at new capabilities and infrastructures; and a design focus that includes integrative and holistic consideration of technical and human considerations. Students in the Ph.D. program engage with multiple stakeholders, including faculty and researchers in other disciplines, major corporations and entrepreneurial enterprises, governmental and non-governmental agencies, and volunteer organizations such as open source communities. Through our involvement with these organizations, our research connects to the world beyond the university.

All Ph.D. students are expected to maintain a minimum GPA of 3.5 throughout the program. In addition, no grade lower than B is counted towards satisfying any course requirements.

Program of Study

Pre-Candidacy Course Requirements

1. Required Core Courses	
IN4MATX 209S	Seminar in Informatics (twice, usually in the first year)
IN4MATX 232	Research in Human-Centered Computing
IN4MATX 261	Social Analysis of Computing
2. Research Methods Core	
IN4MATX 201	Research Methodology for Informatics
IN4MATX 203	Qualitative Research Methods in Information Systems

IN4MATX 205	Quantitative Research Methods in Information Systems
IN4MATX 207S	Doctoral Seminar on Research and Writing (once, usually after first year)
3. Research Experience	
IN4MATX 299	Individual Study (four quarters required pre-advancement, recommended at least two quarters per year in each of the first two years)
4. Electives in Informatics (6 Ph.D. level classes, all four units)	

A set of six elective courses. The selection of courses should form a coherent educational plan to be approved by the student's faculty advisor and by the Informatics Ph.D. program director. A written record of this plan and its approval must be filed with the Ph.D. program director prior to advancement. Although the courses may be chosen from any Ph.D. level courses on campus, it is recommended that at least three be chosen from within the School of ICS.

Teaching Requirements

To enhance their education and experience in teaching, all students will be required to work as readers or TAs for at least two quarters. Additionally, before or during the first quarter in which they are working in this capacity, all students will enroll in I&C SCI 398A, a two-unit seminar. Those students wishing to gain more instruction around their teaching may also enroll in I&C SCI 398B, the advanced teaching seminar, which is also a two-unit seminar.

Field Examinations

There will be no formal field evaluations. However, each year, students will be evaluated individually and given written feedback about their progress (for first year students, this evaluation will take place before the end of Spring quarter; for continuing students, it will take place before the end of Fall quarter.) In preparation, students will write a statement about their progress and meet with their advisors who give some feedback and complete a form reporting their assessment of the student's progress. The program faculty as a whole will then meet to discuss all the students, with a letter written to the student summarizing the assessment and, if necessary, deadlines for specific activities to be finished or goals to be achieved. This evaluation letter will state either that the student is making good progress or has been given cautionary status. The students who have certain activities to finish will be reviewed again six months after this evaluation. A second cautionary review constitutes formal failure to make adequate progress within the program.

Qualifying Exam

At the end of the student's second year: The student develops an appropriate reading list to fit his/her areas of interest within Informatics, co-developed with the advisor. The student then writes a paper synthesizing this literature and noting the areas that are currently interesting and under-researched. The paper serves as the basis for an oral examination, generally in the Spring quarter of the second year.

At the end of the third year: The student will be evaluated by an assessment of a research portfolio. A portfolio should comprise three papers of publishable quality, as judged by the faculty. These papers might well be expansions or developments from term papers developed in class; the goal is to determine the student's capacity to produce research writing of publishable quality. Student may work on papers collaboratively, but the portfolio as a whole must demonstrate writing ability through single-authored or lead-authored work. (Collaboratively written papers will be accompanied by a statement of contributions signed by all authors.)

The students are encouraged to report on projects conducted with at least two different faculty members. Advancement to candidacy is on the basis of an oral defense of the research portfolio, normally in the Spring of the third year. The advancement committee is formed in accordance with UCI campus regulations.

Doctoral Dissertation

Students are required to complete a doctoral dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. The dissertation must be approved unanimously by the committee.

Final Examination

The dissertation defense committee is formed in accordance to UCI Senate regulations. This committee must approve the following for the student to pass the final examination:

Dissertation topic: The student must present a substantial written document representing the student's dissertation plan. This document must include the proposed dissertation abstract, a dissertation outline, a comprehensive survey of related work, and a detailed plan for completing the work. The student must present this dissertation plan to the dissertation committee, who must unanimously approve the student's proposal.

Dissertation document: The student must prepare the written dissertation in accordance with Academic Senate regulations and present this document to the committee with enough advance notice for appropriate review and critique prior to an oral defense. Following an oral defense of this document, any changes required must be approved by the entire committee.

Oral defense: The student must pass an oral dissertation defense that consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. To ensure the public has an opportunity to participate in this examination, the student must announce the defense title, date, and time at least two weeks prior to the event to all faculty and doctoral students in the department.

Normative Time from Matriculation to Degree

Students making normal progress are expected to complete their coursework and produce 2-3 research papers of publishable quality in three years. The dissertation proposal is expected midway through the fourth year, with completion in the sixth.

Software Engineering

The field of Software Engineering is concerned with the creation and analysis of the complex software systems that underlie modern society. Research in Software Engineering targets software artifacts and the people who create them. The field is large, and it encompasses engineering design research, i.e., the creation of new software artifacts with some desirable properties, as well as empirical research, i.e., the study of the effects that software development tools and methods have in the context of software development teams. Topics include software architectures, testing and debugging, software development tools, formal languages, requirements engineering, mining of large software-related data sources, reverse engineering, and development processes.

The Ph.D. in Software Engineering (SE) offers students opportunities for graduate study in the spectrum of intellectual activity in SE. The M.S. in SE complements undergraduate knowledge in related fields with a solid framework for understanding the development of complex software systems.

Undergraduate Preparation for Admission. Typically, incoming students will have an undergraduate degree in computer science, though students may have an undergraduate degree in any field. Additionally they must have significant experience in software development. The ideal applicant is one who shows a considerable analytical depth in the practice of software development, typically gained from first-hand experience with large projects. Students admitted without a major in computer science, informatics, or equivalent will be expected to take undergraduate courses to fill any gaps.

Incoming students who already have a M.S. in Computer Science or closely related field may be exempted from (part of) the pre-candidacy course requirements by petition to the Graduate Dean, as filed by the student's faculty advisor.

Ph.D. in Software Engineering

Program of Study for the Software Engineering Ph.D.

Pre-Candidacy Course Requirements

Students must complete four software engineering core courses, six elective courses, and two quarters of seminars, literature survey, and individual study courses.

1. Software Engineering Core Courses:

IN4MATX 211	Software Engineering
IN4MATX 212	Analysis of Programming Languages
IN4MATX 215	Software Analysis and Testing
IN4MATX 221	Software Architecture

2. Software Engineering Electives. Six elective courses chosen from the following courses offered by the School of ICS (all four units). The set of elective courses chosen by the student must be approved by the student's research advisor. With the advisor's permission, the student may substitute other non-seminar courses, as long as they are related to the student's research interests.

IN4MATX 203	Qualitative Research Methods in Information Systems
IN4MATX 205	Quantitative Research Methods in Information Systems
IN4MATX 213	Requirements Engineering and Specification
IN4MATX 223	Applied Software Design Techniques
IN4MATX 231	User Interface Design and Evaluation
IN4MATX 233	Intelligent User Interfaces
IN4MATX 235	Advanced User Interface Architecture
IN4MATX 241	Introduction to Ubiquitous Computing
IN4MATX 242	Ubiquitous Computing and Interaction
IN4MATX 251	Computer-Supported Cooperative Work
IN4MATX 261	Social Analysis of Computing
IN4MATX 269	Computer Law
COMPSCI 203	Network and Distributed Systems Security
COMPSCI 221	Information Retrieval, Filtering, and Classification
COMPSCI 222	Principles of Data Management
COMPSCI 225	Next Generation Search Systems
COMPSCI 230	Distributed Computer Systems
COMPSCI 232	Computer and Communication Networks
COMPSCI 237	Middleware for Networked and Distributed Systems

COMPSCI 241	Advanced Compiler Construction
COMPSCI 271	Introduction to Artificial Intelligence
COMPSCI 273A	Machine Learning
COMPSCI 277	Data Mining
3. Seminars and Individual Study:	
IN4MATX 209S	Seminar in Informatics (two quarters; four units each)
IN4MATX 291S	Literature Survey in Software Engineering (two quarters; two units each)
IN4MATX 299	Individual Study (two quarters; four units each)

Qualifying Examinations

Written Comprehensive Examination

Students must pass a written examination testing their knowledge of the relevant topics and literature in Software Engineering and their ability to formulate clear arguments in writing and under time constraints. This examination is based on a predetermined reading list maintained by the program faculty. Preparation for this exam is done during two quarters of IN4MATX 291S. This exam is administered at most twice a year.

The exam is graded a Ph.D. PASS, M.S. PASS or FAIL. In case of M.S. PASS or FAIL, it may be re-taken once more, within 12 months, in an attempt to qualify for a Ph.D. PASS. A second M.S. PASS or FAIL results in disqualification of the student from the doctoral program (with or without a terminal M.S. degree).

Research Assessment

Students must find a faculty advisor and successfully complete a research project with that faculty member. The research project should be done over at least two quarters of independent study with that faculty member. The goal of this research assessment is to introduce the student to the practice of scientific publication.

Based on the project, the student must produce a research paper of publishable quality. This research paper must be reviewed by three faculty members in a peer-review process, revised by the student, and approved by the three faculty members.

The research assessment is graded PASS or FAIL. In case of FAIL, the student can re-submit the paper at most one more time within the maximum period of six months. A second FAIL results in disqualification from the program.

Advancement to Candidacy Examination

Each Ph.D. student must pass the oral advancement to candidacy exam, which assesses the student's ability to conduct, present, and orally defend research work at the doctoral level. The research project and paper are the basis for the student's oral advancement to candidacy exam. The oral candidacy exam consists of the research presentation by the student, followed by questions from the candidacy committee.

The student must complete the course requirements, and pass the two qualifying examinations prior to advancing to candidacy. The candidacy committee will consist of five faculty members, the majority of whom must be members of the student's program, and is conducted in accordance with UCI Senate regulations.

Dissertation Topic Defense

The student must present a carefully articulated document representing the student's dissertation plan. This document must include the proposed dissertation abstract, a discussion of the approach, a comprehensive survey of related work, and a plan for completing the work. The dissertation plan is presented by the student to the dissertation committee, who must unanimously approve the student's proposal. The dissertation defense committee is formed in accordance to UCI Senate regulations.

Doctoral Dissertation and Final Examination

Students are required to complete a doctoral dissertation in accordance with Academic Senate regulations. In addition, they must pass an oral thesis defense which consists of a public presentation of the student's research followed by an oral examination by the student's doctoral committee. The committee must approve the thesis unanimously.

The normative time for advancement to candidacy is three years. The normative time for completion of the Ph.D. is six years, and the maximum time permitted is seven years.

M.S. in Software Engineering

Course Requirements

M.S. students must complete four software engineering core courses, six elective courses, and two quarters of seminars (IN4MATX 209S). Students doing Capstone Plan I (Thesis) must complete two quarters, four units each, of Thesis Supervision (IN4MATX 298); students doing Capstone Plan II (Comprehensive Examination) must complete two quarters of literature survey courses.

The course requirements are identical to the Ph.D., diverging only in making the Literature Survey and the Individual Study courses mutually exclusive, depending on the students' Capstone option.

Capstone Requirement

Plan I: Thesis Option. Students must take and pass the Research Assessment examination. Additionally, students are required to defend their thesis in a public exam according to UCI Senate Policy. This requirement must be completed by the end of the second year.

Plan II: Comprehensive Examination Option. Students must take the written comprehensive examination, and obtain an M.S. PASS or higher. This requirement must be completed by the end of the second year. In case of FAIL, the exam may be re-taken once more. A second FAIL results in disqualification of the student from the master's program.

Restriction

The M.S. will not be awarded to students who currently hold a M.S. in software engineering or a related field from the same or another university.

Requirements Beyond Graduate Division Minimum Requirements

All Ph.D. students are expected to maintain a minimum GPA of 3.5 throughout the program. All M.S. students are expected to maintain a minimum GPA of 3.0 throughout the program. Failure to maintain this minimum will result in a recommendation that the student be disqualified. In addition, no grade lower than a B is counted toward satisfying any course requirements.

Faculty

Rebecca W. Black, Ph.D. University of Wisconsin-Madison, *Associate Professor of Informatics*

Geoffrey C. Bowker, Ph.D. University of Melbourne, *Professor of Informatics; Visual Studies* (values in design, social studies of databases, science and technology studies)

Yunan Chen, Ph.D. Drexel University, *Associate Professor of Informatics; Program in Public Health* (medical informatics, human computer interaction)

James P. Dourish, Ph.D. University College London, *Professor of Informatics; Computer Science* (human-computer interaction, computer-supported cooperative work)

Daniel H. Frost, M.S. University of California, Irvine, *Senior Lecturer of Computer Science; Informatics* (artificial intelligence, software engineering, computer graphics, teaching of programming)

Judith Gregory, Ph.D. University of California, San Diego, *Associate Adjunct Professor of Informatics* (values in design, translational biomedical informatics, participatory design, design and emotion)

Gillian Hayes, Ph.D. Georgia Institute of Technology, *Professor of Informatics; Education* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work, educational technology, ubiquitous computing)

Mizuko Ito, Ph.D. Stanford University, *John D. and Catherine T. MacArthur Foundation Chair in Digital Media and Learning and Professor in Residence of Anthropology; Education; Informatics* (ethnography, game studies, youth culture, learning sciences, online communities)

James Jones, Ph.D. Georgia Institute of Technology, *Associate Professor of Informatics* (software engineering, software testing and analysis, debugging and fault localization, static and dynamic analysis, software visualization)

David G. Kay, J.D. Loyola Marymount University, *Senior Lecturer of Informatics; Computer Science* (computer law, computer science education)

Cory P. Knobel, Ph.D. University of Michigan, *Assistant Adjunct Professor of Informatics* (interactive and collaborative technology, values in design, modes of knowledge representation, philosophy of science and technology)

Alfred Kobsa, Ph.D. University of Vienna, *Professor of Informatics; Computer Science* (user modeling, human-computer interaction, artificial intelligence, cognitive science, interdisciplinary computer science)

Cristina V. Lopes, Ph.D. Northeastern University, *Professor of Informatics; Computer Science* (programming languages, acoustic communications, operating systems, software engineering)

Gloria J. Mark, Ph.D. Columbia University, *Professor of Informatics* (computer-supported cooperative work, human-computer interaction)

Melissa Mazmanian, Ph.D. Massachusetts Institute of Technology, *Associate Professor of Informatics* (computer-mediated communication, organization studies, information and communication technologies in practice, social response to emerging technologies, work/non-work negotiations in the information age)

Bonnie A. Nardi, Ph.D. University of California, Irvine, *Professor of Informatics* (computer-supported collaborative work, human-computer interaction, computer-mediated communication, user studies methods, activity theory, cultural responses to technology development)

Emily Navarro, Ph.D. University of California, Irvine, *Lecturer of Informatics*

Gary Olson, Ph.D. Stanford University, *Donald Bren Professor of Information & Computer Sciences and Professor of Informatics* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Judith Olson, Ph.D. University of Michigan, *Donald Bren Professor of Information & Computer Sciences and Professor of Informatics; Paul Merage School of Business; Planning, Policy, and Design* (interactive and collaborative technology, human-computer interaction, computer-supported cooperative work)

Donald J. Patterson, Ph.D. University of Washington, *Associate Professor of Informatics; Computer Science* (ubiquitous computing, pervasive computing, human-computer interaction, artificial intelligence, intelligent context for situated computing)

Richard Pattis, M.S. Stanford University, *Senior Lecturer of Computer Science; Informatics* (MicroWorlds for teaching programming, debugging, computational tools for non-computer scientists)

David F. Redmiles, Ph.D. University of Colorado Boulder, *Professor of Informatics* (computer-supported cooperative work, human computer interaction, software engineering, globally distributed development teams, user interfaces, software tools)

Debra J. Richardson, Ph.D. University of Massachusetts, *Professor Emeritus of Informatics* (software engineering, program testing, life-cycle validation, software environments)

Kurt Squire, Ph.D. Indiana University, *Professor of Informatics* (video game design, games for learning, mobile technologies, civic engagement, place-based learning)

Constance Steinkuehler, Ph.D. University of Wisconsin, Madison, *Professor of Informatics* (video games for impact, game-mediated cognition and learning, online social interaction, video games and policy)

Joshua Tanenbaum, M.A. Simon Fraser University, *Acting Assistant Professor of Informatics* (digital games and narrative, tangible and wearable interaction, maker and DIY culture, nonverbal communication and virtual worlds)

Richard N. Taylor, Ph.D. University of Colorado Boulder, *Professor Emeritus of Informatics* (software engineering, user interfaces, environments, team support)

William M. Tomlinson, Ph.D. Massachusetts Institute of Technology, *Professor of Informatics; Education* (environmental informatics, educational technology, computer graphics/visualization/digital arts)

Hadar Ziv, Ph.D. University of California, Irvine, *Lecturer of Informatics* (software testing, requirements engineering, Bayesian modeling)

André W. van der Hoek, Ph.D. University of Colorado Boulder, *Professor of Informatics* (software engineering)

Affiliate Faculty

John L. Crawford, Media Artist and Software Designer, *Graduate Advisor and Associate Dean for Research Creation and Associate Professor of Dance; Informatics* (dance film, interactive media, telematic performance, motion capture, digital arts)

John Christopher Dobrian, Ph.D. University of California, San Diego, *Professor of Music; Informatics*

Magda S. El Zarki, Ph.D. Columbia University, *Professor of Computer Science; Electrical Engineering and Computer Science; Informatics* (telecommunications, networks, wireless communication, video transmission)

Vijay Gurbaxani, Ph.D. University of Rochester, *Taco Bell Chair in Information Technology Management and Professor of Paul Merage School of Business; Informatics* (economics of information systems management, impact of information technology on organization and market structure)

Jesse C. Jackson, M.A. University of Toronto, *Director of the Minor in Digital Arts and Assistant Professor of Art; Informatics*

Peter O. Krapp, Ph.D. University of California, Santa Barbara, *Department Chair and Professor of Film and Media Studies; English; Informatics; Visual Studies* (digital culture, media history, cultural memory)

Simon G. Penny, M.F.A. Hong Kong University of Science and Technology, *Professor of Art; Informatics* (informatics, robotic sculpture, interactive environments, electronic media)

Kavita S. Philip, Ph.D. Cornell University, *Associate Professor of History; Comparative Literature; Informatics* (history of modern South Asia, science and technology, political ecology, critical theoretical studies of race, gender, colonialism, new media, and globalization)

Stephanie Reich, Ph.D. Vanderbilt University, *Associate Professor of Education; Informatics; Psychology and Social Behavior* (child development, parenting, peer interactions, media, program evaluation)

Alladi Venkatesh, Ph.D. Syracuse University, *Professor of Paul Merage School of Business; Informatics* (social impacts of information technology, Internet and the New Economy, Smart Home technologies, children and multimedia)

Mark J. Warschauer, Ph.D. University of Hawaii at Manoa, *Professor of Education; Informatics* (language, literacy, technology, STEM)