



Informatics Courses

Below you will find the courses and their prerequisites in the Informatics degree program.

Please note that the prerequisites are listed only with their Informatics course numbers; some Informatics courses are cross-listed with equivalent (but differently numbered) courses in ICS. Please see the UCI Catalogue for exact details.

	<i>COURSE NUMBER</i>	<i>COURSE NAME & DESCRIPTION</i>	<i>PREREQUISITES</i>
First Year	Philosophy 29	Critical Reasoning	(none)
		Introduction to analysis and reasoning. The concepts of argument, premise, and conclusion, validity and invalidity, consistency and inconsistency. Identifying and assessing premises and inferences. Deductive versus inductive reasoning, and introduction to the probability calculus. Evaluating definitions. Informal fallacies.	
	Philosophy 30	Introduction to Symbolic Logic	(none)
		An introduction to the symbolism and methods of the logic of statements, including evaluation of arguments by truth tables, the techniques of natural deduction and semantic tableaux.	
	Math 13	Introduction to Abstract Math	(none)
		The style of precise definition and rigorous proof which is characteristic of modern mathematics. Topics include set theory, equivalence relations, proof by mathematical induction, and number theory. Students construct original proofs to statements.	
	Informatics 41 (6 unit)	Informatics Core I	(none)
		Fundamental concepts of computer software design and construction. Data, algorithms, functions, and abstractions. Overview of computer systems: data representation, architectural components, operating systems, networks. Introduction to information systems: parties involved, architectural alternatives, usability, organizational and social concerns.	
	Informatics 42 (6 unit)	Informatics Core II	Informatics 41
		Alternative data structure implementations; analysis of time and space efficiency. Object-oriented programming concepts and techniques: classes, objects, inheritance, interfaces. Formal languages and automata. Problem modeling and design tradeoffs.	
Informatics 43 (6 unit)	Informatics Core III	Informatics 42	
	Concepts, methods, and current practice of software engineering. Large-scale software production, software life cycle models, principles and techniques for each stage of development. Laboratory project applying these concepts.		

First Year (continued)	Informatics 44 (2 unit)	Seminar in Informatics Research Topics	(none)
		Introduction to current research topics in Informatics. Various faculty members present current research and relate it to the course content of the Informatics degree program.	
	ICS 23	Fundamental Data Structures	Informatics 42
		Focuses on implementation and mathematical analysis of fundamental data structures and algorithms. Covers storage allocation and memory management techniques.	
	ICS 6A or Math 6A	Discrete Mathematics for Computer Science	High school mathematics through trigonometry
	Covers essential tools from discrete mathematics used in computer science with an emphasis on the process of abstracting computational problems and analyzing them mathematically. Topics include: combinatorics, mathematical induction, elementary probability, and asymptotic analysis.		
Second Year	Stat 7 or Math 7	Basic Statistics	(none)
		Basic inferential statistics including confidence intervals and hypothesis testing on means and proportions, t-distribution, Chi Square, regression and correlation. F-distribution and nonparametric statistics included if time permits.	
	Stat 67 or Math 67	Introduction to Probability and Statistics	Math 2B, 6A, and 6C or 3A
		Introductory course focusing on basic concepts in probability and statistics with discussion of applications to computer science.	
	Informatics 101	Concepts in Programming Languages I	Informatics 43
		In-depth study of several contemporary programming languages stressing variety in data structures, operations, notation, and control. Examination of different programming paradigms, such as logic programming, functional programming and object-oriented programming; implementation strategies, programming environments, and programming style.	
	Informatics 102	Concepts in Programming Languages II	Informatics 101
		In-depth study of major programming paradigms: imperative, functional, declarative, object-oriented, and aspect-oriented. Understanding the role of programming languages in software development and the suitability of languages in context. Domain-specific languages. Designing new languages for better software development support.	
	Informatics 111	Software Methods and Tools	Informatics 43
	Concepts and techniques of constructing software in a systematic fashion, including detailed design techniques, specifications, programming methods, quality-inducing procedures, development tools, team techniques, testing estimation, and performance improvement. Laboratory work involves exercises to illustrate important concepts, methods, and tools.		

Second Year (continued)	Informatics 113	Requirements Analysis and Engineering	Informatics 111; Math 6A; Math 7 or 67
		Aims to equip students to develop techniques of software-intensive systems through successful requirements analysis techniques and requirements engineering. Students learn systematic process of developing requirements through co-operative problem analysis, representation, and validation.	
	Informatics 115	Software Specification and Quality Engineering	Informatics 111; Math 6A; Math 7 or 67; Philosophy 29 or 30 or Math 13
		Aims to prepare students to develop high quality software through successful specification and quality engineering techniques. Students learn what high quality means, how to plan for and achieve it, and how to measure it.	
	Informatics 131	Human-Computer Interaction	Informatics 42
		Presents basic principles of human-computer interaction (HCI). Introduces students to user interface design techniques, design guidelines, and usability testing. Students gain the ability to design and evaluate user interfaces and become familiar with some of the outstanding research problems in HCI.	
	Informatics 132	Project in Human-Computer Interaction and User Interfaces	Informatics 131
		The goal of this project course is to prepare students to develop and evaluate user interfaces to software systems through a one-quarter project.	
Third Year	Informatics 121	Software Design I	Informatics 102
		Introduction to software design principles, paradigms, tools, and techniques. Topics include alternative architectural styles, iterative refinement, design patterns, mapping design onto code, design tools, and design notations. The course includes extensive practice in creating designs and study of existing designs.	
	Informatics 122	Software Design II	Informatics 121
		Introduction to advanced software design principles, paradigms, and techniques. Topics include large-scale design, software reuse, product-line architectures, design recovery, refactoring, application frameworks, real-time systems, and design-for-context. The course includes case studies of existing designs and extensive practice with real-world designs.	
	Informatics 123	SW Architecture, Distributed Systems, and Interoperability	Informatics 122
		Aims to prepare students to engineer well-structured distributed software systems. Students learn a wide range of software architectural styles, architectural platforms that provide standard services to applications, and formal architecture description languages.	

Third Year (continued)	Informatics 161	Social Analysis of Computerization	Informatics 43
		Introduction of computerization as a social process. Examines the social opportunities and problems raised by new information technologies, and the consequences of different ways of organizing. Topics include computerization and work life, privacy, virtual communities, productivity paradox, systems risks.	
	Informatics 162	Organizational Information Systems	Informatics 161
		Introduction to role of information systems in organizations, components and structure of organizational information systems, and techniques used in information systems analysis, design and implementation.	
	Informatics 163	Project in Social & Organizational Impacts of Computing	Informatics 162
		Students undertake projects intended to gather and analyze data from situations in which computers are used, organize and conduct experiments intended to test hypotheses about impacts, and explore the application of concepts learned in previous courses.	
	CS 122A	Introduction to Data Management	Informatics 43
	Introduction to the design of databases and the use of database management systems (DBMS) for applications. Topics include entity-relationship modeling for design, relational data model, relational algebra, relational design theory, and SQL (Structured Query Language) programming.		
Fourth Year	CS 122B	Project in Database Management	CS 122A
		Introduces students to advanced database technologies. Students gain experience in programming complex applications using database management systems. Topics include object-oriented and object-related technologies, XML, and Internet databases.	
	Informatics 141	Information Retrieval	Informatics 43; MATH 7 or 67
		An introduction to information retrieval including indexing, retrieval, classifying, and clustering text and multi-media documents.	
	Informatics 143	Information Visualization	Informatics 131 (pre- or co-requisite)
		Introduction to interactive visual interfaces for large datasets, and to principles of human visual perception and human computer interaction that inform their design. Various applications for data analysis and monitoring will be discussed.	
	Informatics 151	Project Management	Informatics 43, 161
	Introduces theoretical and practical aspects of project management. Topics include organizational theory, group behavior, project management skills, case studies, personal and group productivity tools, management of distributed work, stakeholders, consultants, and knowledge management. Student will do a project exercise.		

Fourth Year (continued)	Informatics 153	Computer-Supported Cooperative Work	Informatics 43, 161
		Introduces concepts and principles of collaborative systems. Topics may include shared workspaces, group interaction, workflow, architectures, interaction between social and technical features of group work, and examples of collaborative systems used in real-world settings. Students will develop a simple collaborative application.	
	Informatics 191ABC (3 quarter course)	Senior Design Project	Informatics 123, 132, 163; CS 122A; Informatics 151 (co-requisite)
		Group supervised project in which students analyze, specify, design, construct, evaluate, and adapt a significant information processing system. Topics include team management, professional ethics, and systems analysis. In-progress grading. Informatics 191 A-B-C must be taken in the same academic year.	