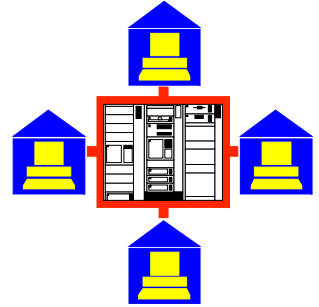


Computer Science

Department of Computer Science



Faculty

Elena Braynova, Assistant Professor (2003)
M.S., SUNY, Buffalo, NY; M.S., Ph.D., Moscow St. University, Russia

Paul Chiasson, Associate Professor (2000)
B.S., Fitchburg State College; M.S., Fitchburg State College

Dale Fish, Instructor (2000)
B.S., M.S., University of Connecticut

Aparna Mahadev, Professor (1999)
B.Sc., University of Madras, India; M. Sc., University of Madras, India; M.S., Indian Institute of Technology, India; Ph.D University of Waterloo, Canada

Hemant Pendharkar, Assistant Professor (2001)
B.S., M.S., University of Bombay, India; M.S., Ph.D., University of New Hampshire

Karl Wurst, Associate Professor (1999), Department Chair
B.S., Central Connecticut State University; M.S., Ph.D., University of Connecticut

The Computer Science program offers education in the field for those who wish to pursue careers as software engineers, software developers, programmers, database designers and in other related areas.

It is highly recommended that entering students have four years of high school mathematics including the equivalent of pre-calculus. The following ancillary and distribution requirements cannot be taken on a pass/fail basis.

Ancillary Requirements for the Computer Science Major: (30 credits)

MA 200 & MA 201	Calculus I and II
MA 220 & MA 290	Discrete Mathematics I and II
MA 302	Probability and Statistics
12 Credits in Lab Science, including a two-semester sequence.	
All courses must be chosen from department-approved list of courses.	

Additionally, students majoring in Computer Science must complete the following courses towards distribution requirements.

CM 150	Public Speaking
EN 252	Technical Writing
UR 230	Technology, Public Policy & Urban Society

Requirements for a Major in Computer Science: 45 Credits

Required Courses: 33 Credits

CS 140	Computer Science I
CS 145	Computer Science II
CS 242	Data Structures
CS 253	Digital Computer Organization and Assembly Language
CS 282	UNIX Systems Programming
CS 352	Digital Computer Architecture
CS 371	Computability Theory
CS 373	Operating Systems
CS 401	Object Oriented Software Development
CS 442	Algorithm Analysis

Elective Courses: 12 Credits in Computer Science courses at the 300 level or above. Up to 3 credits of internship (CS 498) and up to 3 credits of Independent Study (CS 499) may be used to satisfy the major elective requirements.

Requirements for a Minor in Computer Science: (Minimum of 20 credits)

CS 140	Computer Science I
CS 145	Computer Science II
CS 242	Data Structures
CS 282	UNIX Systems Programming
CS 372	Principles of Programming Languages

Plus one more Computer Science course above 200 level

Requirements for a Minor in Web Development: (19 Credits)

CS 140	Computer Science I
CS 161	Basics of Web Design
CS 261	Advanced Web Design Using Scripting Languages
CS 265	Database Applications
CS 365	Client Server Computing Using the Internet

Plus one more elective in consultation with the department

Requirements for a Minor in Information Technology: (18+ credits)

Required Courses:

CS 130	Fundamentals of Information Technology
CS 235	Data Communication and Networking for Non-Majors
CS 257	Information Storage and Retrieval

Courses may be taken from the following to complete the remaining credits:

BA 351	Managing e-Business
BT/NS 378	Bioinformatics
EN 281	Web Authoring and Publication
UR 230	Technology, Public Policy and Urban Society

Note: All computer science courses must be taken in sequence, i.e., CS 100 level courses must be completed before CS 200 level courses are begun. In turn, all lower division course requirements must be completed before upper division courses are begun. **Due to the changing nature of the program, students are strongly advised to meet with their advisor before registering for classes.**

Computer Science Courses

CS 120 Microcomputer Applications in Business I

Learning state-of-the-art application packages including but not limited to word processing, spreadsheets and presentation software.

Offered every year. 3 credits.

CS 121 Microcomputer Applications in Business II

Prerequisite: CS 120

Advanced features of application packages including but not limited to spreadsheets, database management systems, graphics and integration.

Offered every year. 3 credits.

CS 130 Fundamentals of Information Technology

Theory and concepts behind information technology; algorithmic thinking and common logic styles prevalent in today's computer systems and applications.

Offered every year. 3 credits.

CS 140 Computer Science I

Prerequisite: Familiarity with basic computer operations or CS 120

Introduction to fundamental structures and concepts of Computer Science including object-oriented programming; three lectures and one two-hour laboratory.

Offered every year. 4 credits.

CS 145 Computer Science II

Prerequisites: CS 140

Continuation of material from CS 140; file processing, GUIs, advanced concepts and data structures; three lectures and one two-hour laboratory.

Offered every year. 4 credits.

CS 161 Basics of Web Design

Prerequisites: CS 140

Introduces concepts needed for creation, design and implementation of effective web pages. Latest versions of mark-up language(s) will be used.

Offered every year. 3 credits.

CS 235 Data Communication and Networking for Non-Majors

Prerequisites: CS 130

This course covers the basic of computer networking and communications. It emphasizes both the Internet and business computer networking.

Offered every year. 3 credits.

CS 240 Application Development using Visual BASIC

Prerequisites: CS 140

Using the Visual Programming System to create robust and useful applications that make use of the graphical user interface.

Offered every 2 years. 3 credits.

CS 242 Data Structures

Prerequisites: CS 145, MA 290

introduces time complexity and covers fundamental data structures: lists, stacks, queues, search trees, dictionaries, priority queues, B-trees and inverted files.

Offered every year. 3 credits.

CS 253 Digital Computer Organization and Assembly Language

Prerequisites: CS 145, EN 252, MA 290

Design and analysis of combinational and sequential circuits; Assembly language programming, Digital computer organization. Three lectures and one two hour laboratory.

Offered every year. 4 credits.

CS 257 Information Storage and Retrieval

Prerequisites: CS 130

This course provides a sound, real world understanding of Data Storage and retrieval as it relates to business and industry.

Offered every year. 3 credits.

CS 261 Advanced Web Design Using Scripting Languages

Prerequisites: CS 161

This course covers scripting languages and teaches how to make the web pages interactive by embedding executable scripts into them.

Offered every 2 years. 3 credits.

CS 265 Database Applications

Prerequisites: CS 140

This course introduces basic database concepts and teaches how to create a database; use SQL; and create database applications.

Offered every 2 years. 3 credits.

CS 282 UNIX Systems Programming

Prerequisites: CS 242

Problem solving and software design using C; introduction to UNIX programming utilities and text manipulation; low-level system programming in UNIX and C.

Offered every year. 3 credits.

CS 297 Selected Topics in Computer Science

Topics of mutual interest to students and faculty.

Offered every 3 years. 1-4 credits.

CS 335 Networking and Web Security

Prerequisites: CS 140, CS 265, or CS 282

This course covers web and security problems, solutions, and techniques. Encryption, worms, viruses, firewall, safer practices, etc. are covered.

Offered every 2 years. 3 credits.

CS 341 Advanced Assembly Language Programming

Prerequisites: CS 253

Builds on the assembler knowledge from CS 253. Assembly Language topics covered are MACROS, subprograms, ISRs, debugging, and special purpose instructions.

Offered every 2 years. 3 credits.

CS 345 Object Oriented Programming with C++

Prerequisites: CS 282

Introduction to the fundamentals of C++; Topics include objects/classes, single/multiple inheritance, friend functions, operator overloading, polymorphism and streams.

Offered every 2 years. 3 credits.

CS 352 Digital Computer Architecture

Prerequisites: CS 253

A study of the internal structure of a typical digital computer from both a logical and a hardware viewpoint; memory devices, arithmetic, and control circuits including LSI and MSI components.

Offered every year. 3 credits.

CS 365 Client Server Computing Using the Internet

Prerequisites: CS 242 or CS 265

This course covers what client/server is and covers various client/server models and explores the Internet from a client/server perspective.

Offered every 2 years. 3 credits.

CS 371 Computability Theory

Prerequisites: CS 145, MA 201, MA 290, EN 252

This course provides an introduction to theoretical computer science. Covers the fundamentals of automata theory, formal languages, and computability theory.

Offered every year. 3 credits.

CS 372 Principles of Programming Languages

Prerequisites: CS 282

Topics include comparison of syntax and semantic descriptions, data types and control, operations and sequencing, ease of use, applicability, generality, non-procedurality, and efficiency.

Offered every 2 years. 3 credits.

CS 373 Operating Systems

Prerequisites: CS 352, CS282, EN252

Hardware and software as an integrated system; development of system software for process management, resource allocation, memory management and I/O processing.

Offered every year. 3 credits.

CS 375 Software Analysis and Design

Prerequisites: CS 282, CM 110, EN 252

This course deals with software as an engineered product that requires planning, analysis, design, implementation, testing and maintenance.

Offered every 2 years. 3 credits.

CS 380 System Programming

Prerequisites: CS 282

The design and implementation of assemblers, linkers, loaders, editors, and high-level translation software. Algorithms solving specific problems of a system program are investigated.

Offered every 2 years. 3 credits.

CS 400 Database Design

Prerequisites: CS 242, EN 252, CM 110

Introduces database models with emphasis on relational model; ER diagrams, relational calculus, relational algebra and SQL, normalization, transaction processing and recovery.

Offered every other year. 3 credits.

CS 401 Object Oriented Software Development

Prerequisites: CS 242, EN 252, CM 110

This course introduces object-oriented software development concepts as a new way of thinking about problems using models organized around real-world concepts.

Offered every year. 3 credits.

CS 403 Compiler Design

Prerequisites: CS 371, CS 282

This course covers basic concepts involved in the design of compilers such as language definition, lexical, syntactic and semantic analysis, and code generation.

Offered every 3 years. 3 credits.

CS 405 Data Communications and Networking

Prerequisite: CS 373, EN 252, CM 110

Data transmission, encoding, interfacing, synchronization, data-link control, multiplexing, networking, circuit switching, packet switching, radio and satellite, local area networks, network access protocols.

Offered every year. 3 credits.

CS 442 Algorithm Analysis

Prerequisite: CS 282, CS 371, MA 302

Various complexity classes; algorithmic strategies, graph algorithms, pattern matching, cryptographic and geographic algorithms; NP-complete problems.

Offered every year. 3 credits.

CS 471 Artificial Intelligence

Prerequisites: CS 371, CS 242, EN 252

Introduction to central issues of constructing intelligence systems. Examines historical and future trends of AI research.

Offered every 2 years. 3 credits.

CS 497 Selected Topics in Computer Science

Prerequisite: CS 282

Selection of topics of mutual interest to students and faculty.

Offered every 3 years. 1-6 credits.

CS 498 Internship

Prerequisites: Approval by vote of Computer Science faculty; 21 credit hours in Computer Science courses including CS 282.

Working in and for an organization where skills can be tested in real situations in order to gain experience, increase knowledge in various functional areas, and establish important contacts with an organization.

Offered every year. 3 credits.

CS 499 Independent Study

Prerequisites: 18 credit hours in Computer Science including CS 282 and approval by vote of Computer Science faculty.

An opportunity for advanced students to examine topics not normally taught in other computer science courses. Geared to interests of both the student and the instructor.

Offered every year. 1-6 credits.