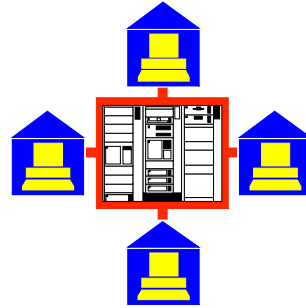


Computer Science

Department of Computer Science



Faculty

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, Associate Professor (1999), Department Chair
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

Virginia Ogozalek, Professor (1982)
A.B., Colby College; M.S., University of Maine; M.S., Worcester Polytechnic Institute; Ph.D Northeastern University

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

Karl Wurst, Assistant Professor (1999)
B.S., Central Connecticut State University; M.S., 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 and two years of high school science.

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.

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 Analysis and Design
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	Web Design using HTML
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 Computer Science: (18+ credits)

Required Courses:

CS 130	Computer Programming Logic and Algorithms
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, word processing, graphics and integration.

Offered every year. 3 credits.

CS 130 Computer Programming Logic and Algorithms

Prerequisite: Familiarity with basic computer operations or CS 120

Theory and concepts behind computer programming; basic tenets of algorithmic thinking and common logic styles prevalent in today's computer programs.

Offered every year. 3 credits.

CS 140 Computer Science I

Prerequisite: Familiarity with basic computer operations or CS 120

CS structures and concepts. Execution, compilation, datatypes, classes, objects, methods, selection, loops, arrays, strings. Problem solving and implementation in a programming language.

Offered every year. 3 credits.

CS 145 Computer Science II

Prerequisites: CS 140

This course builds on the concepts covered in CS 140; advanced programming constructs and concepts; data structures lists and queues.

Offered every year. 3 credits.

CS 161 Web Design Using HTML

Prerequisites: CS 140

Introduces web page design tools; covers how to create web pages using the latest version of HTML by using HTML tags.

Offered every year. 3 credits.

CS 201 Designing User Friendly Interfaces

Prerequisites: CS 140 or CS 161

Introduction to techniques for designing "user friendly" interfaces. Examines innovative technologies including touchscreens, speech recognition, multimedia and virtual reality.

Offered every 2 years. 3 credits.

CS 235 Data Communication and Networking for Non-Majors

Prerequisites: CS 130

This course covers the basic of comuter 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 year. 3 credits.

CS 241 Assembly Language Programming

Prerequisites: CS 145

This course introduces the fundamental operations of the computer system at the assembly language level.

Offered every year. 3 credits.

CS 242 Data Structures

Prerequisites: CS 145, MA 290

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

Offered every year. 3 credits.

CS 245 Programming in C under UNIX

Prerequisites: CS 241

Covers concepts in procedural abstraction and problem solving/software design using C. Students also gain exposure to the UNIX operating system.

Offered every year. 3 credits.

CS 252 Digital Logic Circuits

Prerequisites: CS 241, MA 220

Topics include application of Boolean algebra to an analysis of combinatorial and sequential switching circuits. Characteristics of logic elements, memory devices, and logic circuits to accomplish code conversion.

Offered every year. 4 credits.

CS 253 Digital Computer Organization and Assemble 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 year. 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 year. 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 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, safe practices, etc. are covered.
Offered every year. 3 credits.

CS 340 Data Structures and Algorithm Analysis

Prerequisites: CS 245

Introduces computational complexity; various graph algorithms; binary search trees, dictionaries, priority queues, B-trees, and inverted files; dynamic programming and backtracking.
Offered every year. 3 credits.

CS 341 Advanced Assembly Language Programming

Prerequisites: CS 241

This course is a continuation of CS 241. Assembler Language topics covered are MACROS, subprograms, operating systems, debugging, and special purpose instructions.
Offered every year. 3 credits.

CS 345 Object Oriented Programming with C++

Prerequisites: CS 245

Introduction to the fundamentals of C++; Topics include objects/classes, single/multiple inheritance, friend functions, operator overloading, polymorphism and streams.
Offered every year. 3 credits.

CS 352 Digital Computer Architecture

Prerequisites: CS 252

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 265, CS 261

This course covers what client/server is and covers various client/server models and explores the Internet from a client/server perspective.
Offered every year. 3 credits.

CS 371 Computability Theory

Prerequisites: CS 245, MA 321

This course provides an introduction to theoretical computer science. Covers the fundamentals of automata theory, formal languages, and computability theory.
Offered every 2 years. 3 credits.

CS 372 Principles of Programming Languages

Prerequisites: CS 245

Topics include comparison of syntax and semantic descriptions, data types and control, operations and sequencing, ease of use, applicability, generality, non-procedural, and efficiency.
Offered every year. 3 credits.

Computer Science

CS 373 Operating Systems

Prerequisites: CS 352

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 340

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 245

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 3 years. 3 credits.

CS 400 Database Design

Prerequisites: CS 340

The history and requirements of database development and maintenance; includes comparisons of commercially available models.

Offered every year. 3 credits.

CS 401 Object Oriented Design and Analysis

Prerequisites: CS 340

This course introduces object-oriented analysis and design 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

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 year. 3 credits.

CS 405 Data Communications and Networking

Prerequisite: CS 373

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, MA 321

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

Offered every year. 3 credits.

CS 497 Selected Topics in Computer Science

Prerequisite: CS 245

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 340.

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 3 years. 3 credits.

CS 499 Independent Study

Prerequisites: 18 credit hours in Computer Science including CS 340 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.