

Department of Computer Science

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Professors

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Associate Professors

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Assistant Professors

J. Bowers, M. Kirkpatrick, M. Lam, C. Mayfield, F. Rahman, N. Sprague

Mission Statement

The computer science department strives to be an intellectual community that continually explores the broad field of computing, applies this knowledge to solve problems in a variety of domains and engages with the profession and society at large. Undergraduates join this community when they become majors, participating with faculty and other students in exploring computing through classes, projects, clubs and internships.

Goals

The goals of the computer science department are to:

- Offer small classes that provide opportunities for personal interaction with students.
- Provide a broad, inclusive and up-to-date computing curriculum.
- Provide students opportunities for professional and community engagement and real world experiences.
- Help students to become computing problem solvers and good communicators.
- Produce graduates who will succeed in the computing profession.

Career Opportunities and Marketable Skills

Computing technology pervades modern society and demand for computing professionals is strong and projected to remain strong for the foreseeable future. Careers in computing range from technical positions specifying, designing, building and maintaining networks and systems of all kinds, through project leadership and technical management. The computer science major prepares students for entry-level technical positions as programmers, software developers, requirements analysts, software designers, testers, software quality assurance professionals, system architects, network engineers, information security specialists and computing consultants.

Co-curricular Activities and Organizations

The James Madison University Student Chapter of the Association for Computing Machinery is the local student chapter of the national association for computing professionals. The JMU chapter of Upsilon Pi Epsilon, the international honor society in computer science, recognizes outstanding academic achievement by students and outstanding contributions to education by faculty. The department also sponsors the Cyber Defense, Digital Forensics and Women in Technology clubs.

Students are encouraged to intern in a business or government organization during the summer. Students may receive elective credit toward their major requirements for internship experiences.

Degree and Major Requirements Bachelor of Science in Computer Science

Degree Requirements

Required Courses	Credit Hours
General Education ¹	41
Quantitative requirement (in addition to General Education)	3
Major requirements (listed below)	52-55
University electives	22-25

120

¹ The General Education program contains a set of requirements each student must fulfill. The number of credit hours necessary to fulfill these requirements may vary.

Major Requirements

Major Requirements	Credit Hours
Choose one:	3-4
CS 139. Programming Fundamentals	
CS 149. Programming Fundamentals (Advanced)	
Choose one:	3-4
CS 159. Advanced Programming	
CS 239. Advanced Computer Programming	

CS/MATH 227. Discrete Structures I	3
CS 240. Algorithms and Data Structures	3
CS 260. Technical Communication for Computer Science	3
CS 261. Computer Systems I	3
CS 327. Discrete Structures II	3
CS 345. Software Engineering	3
CS 361. Computer Systems II	3
CS 430. Programming Languages	3
CS 474. Database Design and Application	3
Choose one systems elective:	3
CS 450. Operating Systems	
CS 456. Computer Architecture	
CS 470. Parallel and Distributed Systems	
Computer Science electives above CS 300	9
MATH 235. Calculus I or equivalent	4
Choose one of the following statistics courses:	3-4
MATH 220. Elementary Statistics	
MATH 318. Introduction to Probability and Statistics	

52-55

The credit/no-credit option may not be applied to any courses specifically listed above, nor may that option be applied to Computer Science electives

Progressing in the Major

Students may repeat CS 139/149 and CS 159/239 only once. Most CS courses require a grade of "C-" or better ("B-" or better in CS 139/149) in prerequisites courses. Students must achieve a cumulative grade point average of 2.0 or better in all courses used to satisfy CS major degree requirements.

Certificates

Periodically, the department may offer a collection of two or more advanced courses in a particular area of study.

Students successfully completing those courses will obtain a certificate in that area of study. Examples of possible certificate programs include networking, software engineering and information security.

U.S. Government Requirements for Computer Scientists

The U.S. government standard for occupational category GS-1550: Computer Science Series includes a requirement of 15 hours in statistics and mathematics including differential and integral calculus. This means that students considering a career as a computer scientist with the U.S. government (including DoD, NASA, etc.) must complete more math courses than the minimum requirement for a B.S. degree. Recommended calculus sequences for these students are MATH 235-236 or MATH 231-232-236. However, only the U.S. Office of Personnel Management can give final approval of individual qualifications.

Minor Requirements Computer Science Minor

Minor Adviser: Dr. Michael Kirkpatrick

Courses	Credit Hours
Choose one:	3-4
CS 139. Algorithm Development	
CS 149. Programming Fundamentals (Accelerated)	
CS 159. Advanced Programming	3
Choose twelve credits from the following courses. Must include at least one of CS 240, CS 261 or CS 345	12
CS 227. Discrete Mathematics I	
CS 240. Algorithms and Data Structures	
CS 261. Computer Systems I	
Computer Science courses above CS 300	

18-19

Robotics Minor

Minor Adviser: Dr. Ralph Grove

The robotics minor provides students with appropriate preparation the opportunity to investigate technical issues in the design, construction and application of robots. For a full description of the requirements for the minor in Robotics, see Cross Disciplinary Programs.

Telecommunications Minor

Minor Adviser: Dr. Mohamed Aboutabl

The Department of Computer Science, in cooperation with other departments, offers a cross disciplinary minor in telecommunications. The program is intended to augment major programs in preparing students to become network and telecommunications professionals. For a full description of the requirements for the minor in telecommunications, see Cross Disciplinary Programs.