

Mathematics and Computer Science

Mathematics is at its heart the search for pattern or structure. It is an essential component of the liberal arts: A mathematician finds a structure and develops a vocabulary or theory for describing, exploring, and extending it further. Each course in mathematics engages students in the search and in the articulation of the consequences. The study of mathematics requires both creativity and rigorous, logical thinking. The program in mathematics is designed to meet two goals: (1) to introduce some of the most influential ideas and techniques in mathematics; and (2) to develop problem-solving ability by teaching students to combine creative mathematical searching with rigorous reasoning.

Computer science is a discipline involving the analysis, design, implementation, and maintenance of computer systems; it is a key component of a modern education. The computer science program includes programming and software design, algorithms, system architectures, operating systems, language theory, databases, and online information systems design. The program in computer science is designed to prepare majors for a lifetime of learning that will enable them to move beyond current technology to meet the challenges of the future.

The Mathematics and Computer Science Department offers majors in mathematics and in computer science leading either to the Bachelor of Arts (B.A.) degree or the Bachelor of Science (B.S.) degree. Each program provides a broad education in the fundamentals and problem-solving strategies. The requirements are listed in the grids below. The B.A. options offer basic majors in mathematics and in computer science. The B.S. options are designed for students with an additional strong interest in science or engineering. Both options are appropriate for students who plan to pursue graduate study in the same or related fields.

Minors in mathematics and in computer science complement majors in many fields including biology, business, chemistry, and earth and environmental Science. The requirements are listed below.

The department also offers a secondary (6-12) teacher certification program in cooperation with the Education Department. The program meets all content requirements for effective high-school teaching and for licensure in Virginia. Further, the department has coursework for students seeking certification in elementary education.

The department supports the general studies curriculum by offering courses that meet the quantitative perspectives “Q” requirement. All “Q” courses carry a mathematics placement prerequisite. The math placement codes indicate levels of mathematics preparation for incoming students. A student’s application file, transcripts, and SAT or ACT scores form the basis for his or her placement. The levels are coded by letters: H, A, B, C, D. Students may challenge their placements by contacting the department coordinator.

Major requirements: Mathematics

Course numbers	BA Sem. Hrs	BS Sem. Hrs
Math 171,172 Calculus I, II	8	8
Math 205 Logic and Proof	4	4
Math 217 Linear Algebra	4	4
Core courses: Math 419 Algebraic Structures Math 471 Real Analysis	4	8
Electives , including at least one applied course: Pure math courses: 273,301,316,333,340,419,471,480,489 Applied math courses: 274,310,350, 410	24	20
Math 487 Mathematics Senior Seminar	1	1
Four courses in mathematics, natural sciences, psychology or economics approved by adviser		16
Total required credit hours	45	61
Requirements for secondary teaching certification		
Program must include all of 273,316,340,419, 471 and 301 or 333		
Statistics: Math 210 or 310		
Computer Programming: CS 110 or 112	4	4
Physics: Physics 221 (BS option)		4
Teaching Assistant Program: Math 300	1	1
Total required credit hours	50- 54	62

Minor requirements: Mathematics

Course numbers	Sem. Hrs.
Math 171,172 Calculus I, II	8
One of Math 205 or 217 or 273	4
Two of Math 301, 310, 316, 333, 340, 350, 410, 419, 471, 480,489	8
Total number of credit hours	20

Major requirements: Computer Science

Course numbers	BA Sem. Hrs.	BS Sem. Hrs
CS 112,212 Computer Programming I, II	8	8
CS 205 Logic and Proof	4	4
Core courses: CS 310 Computer Systems CS 311 Data Structures	8	8
Electives: 3 CS courses at 300-400 level	12	12
CS 489 Research in CS		4
Math courses: Calculus: Math 135 or 171 Statistics: Math 210 or 310 Math 172 Calculus II Math 217 Linear Algebra	4 4 4	4 4 4 4
Physics 221 Physics I		4
Total required credit hours	40	56

Minor requirements: Computer Science

Course numbers	Sem. Hrs.
CS 112,212 Computer Programming I, II	8
CS 110 or CS 205	4
Two of CS 310,311,331,350,380, 430,440, 480,489	8
Total number of credit hours	20