

Programming and Computation Certificate

The Programming and Computation Certificate, administered by the Department of Computer Science, is designed to support computational work in disciplines other than computer science and to provide students with skills in the use of computer applications. Any non-computer science major may take any Programming and Computation course for which the student meets the prerequisite. No application process is required.

Total Hours Required: 18

Requirements

Requirements are listed in the table below. Additional requirements may follow the table, so be sure to read the entire page. Some required courses listed below may also satisfy [General Education](#) requirements, including [Core Curriculum](#). Students should also review the [University's Undergraduate Minor and Certificate Requirements and Policies](#).

Code	Title	Hours
C S 303E	Elements of Computers and Programming (or the equivalent)	3
C S 313E	Elements of Software Design (or the equivalent)	3
Hours chosen from:		12
C S 323E	Elements of Scientific Computing	
C S 324E	Elements of Graphics and Visualization	
C S 326E	Elements of Networking	
C S 327E	Elements of Databases	
C S 328E	Topics in Elements of Computing	
C S 329E	Advanced Topics in Elements of Computing	
C S 330E	Elements of Software Engineering I	
C S 331E	Elements of Software Engineering II	
College Requirements - Natural Sciences		
Undergraduate Minor and Certificate Requirements and Policies		
Total Hours		18

Additional Requirements and Policy

- To earn the Programming and Computation Certificate, students must complete 18 semester hours of coursework with a grade of at least C- in each course.
- With the approval of the certificate program faculty committee, up to two appropriate substitute courses may be counted toward the elective requirement. This includes courses that are transferred in from other universities and/or study abroad.
- Students will be allowed a maximum of two attempts at C S 303E and C S 313E. Symbols of CR, Q, and W count as course attempts, as do grades below C-.
- Undergraduate students will be allowed to enroll in a maximum of two upper division courses in a semester and four upper division courses in total.