

Computer Science (Csc)



Career Profile

Computer science applies the power of the computer to solve some of the most perplexing problems of science, engineering, and business. The program at the School of Mines focuses on the scientific and engineering aspects of the field and trains students to develop highly complex programs from initial concept to final product.

Computer scientists work in all types of industries and organizations: aeronautical sciences, biomedical research, business, astronomy, geology, and others. Computer scientists created a flight simulator for the space shuttle that helps train astronauts. They create programs that simulate the aerodynamic properties of new types of aircraft and racing vehicles. Industrial robots that perform jobs too dangerous for humans are guided by computer programs. Computer scientists develop programs that help us to better predict the weather and to predict earthquakes.

Computer scientists in the biomedical field create programs that analyze and test new drugs and chemical compounds, programs that help researchers in the area of genetic manipulation, programs that help physicians diagnose and treat medical problems, and programs that help nurses monitor patients and dispense medications.

In the world of business, computer scientists create programs that allow financial analysts to model the economy and predict future trends.

Accreditation

The South Dakota School of Mines and Technology is accredited by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools, the recognized accrediting agency for the north central states.

The computer science program is also accredited by the Accreditation Board for Engineering and Technology (ABET).

Labs and Facilities

Computer science is a rapidly changing field, and the department makes certain that our equipment and curriculum keep pace with changing technology. Resources include an extensive PC network, a Linux lab, a Tablet PC lab, and Robotics Lab. The Linux lab is fully equipped with quad-core desktops. Other computing resources may be accessed via the Internet. The institution encourages its students to use the computer facilities in the creative and efficient solution of scientific and engineering problems.

Faculty

Chair: Dr. Kyle Riley, associate professor

Professors: Dr. Edward Corwin, Dr. Toni Logar, Dr. Manuel Penalzoza, and Dr. John Weiss

Associate Professor: Dr. Jeffrey McGough

Assistant Professors: Dr. Randy Hoover and Dr. Ziliang Zong

Emeritus Professors: Mr. Harold Carda, Mr. Roger Opp, and Dr. Ronald Weger

Instructor: Mr. Roger Schrader

Features and Strengths

The computer science major features a well-developed curriculum that emphasizes both the software and the hardware aspects of the discipline. The faculty in the department consider teaching undergraduates to be their most important activity, and they pride themselves on the personal contact they have with their students.

Program Overview

The primary goal of the program is to prepare graduates to enter a dynamic and rapidly changing field as competent computer scientists. Graduates will be capable in all phases of software development including design, development, and testing, and they will have a firm understanding of hardware technologies.

Outcomes

- School of Mines computer science graduates received salary offers that average more than \$56,000.
- 100 percent of 2007-08 School of Mines computer science graduates were placed in their field or entered a graduate program within a year of graduation.
- 75 percent of graduates gain real-life experience through internships and co-ops.
- Companies hiring computer science graduates include Microsoft, Rockwell Collins, Northrop Gruman, IBM, L3 Communications, and Hewlett-Packard.

Student Organizations

Students at the School of Mines also have a variety of opportunities for extra-curricular activities that range from music, intramurals, and drama to ski and snowboarding, and more than 75 other clubs and professional student organizations. These are important activities for students and they are

encouraged to take full advantage of out-of-classroom events.

The Center for Advanced Manufacturing and Production (CAMP) is designed to teach students engineering, science, and design skills, as well as the ability to work in teams. Computer science majors have been very active with the Robotics team and the Unmanned Aerial Vehicle competition. Many CAMP projects have the opportunity to utilize the skills of a software engineer.

Research

Students have the opportunity to be involved in research with professors conducting work on projects in friction stir-welding, satellite image processing, ground penetrating radar, and software for various CAMP projects.

Curriculum Listing

<http://catalog.sdsmt.edu>

COMPUTER SCIENCE CURRICULUM/CHECKLIST

FRESHMAN YEAR

First Semester

ENGL 101	Composition I	3
Science Elective ¹		3
Science Elective Lab ¹		1
MATH 123	Calculus I	4
CSC 150	Computer Science I	3
Humanities or Social Sciences Elective(s) ¹		3
TOTAL		17

Second Semester

MATH 125	Calculus II	4
Humanities or Social Sciences Elective(s) ¹		3
CSC 250	Computer Science II	4
CSC 251	Finite Structures	4
PE	Physical Education	1
TOTAL		16

SOPHOMORE YEAR

First Semester

CSC 300	Data Structures	4
MATH 225	Calculus III	4
CENG 244	Intro. to Digital Systems	4
PE	Physical Education	1
Humanities or Social Sciences Elective(s) ¹		3
TOTAL		16

Second Semester

ENGL 279	Technical Communications I	3
CSC 314	Assembly Language	4
Humanities or Social Sciences Elective(s) ¹		3
Science Elective ¹		3
Science Elective Lab ¹		1
Free Elective		2
TOTAL		16

JUNIOR YEAR

First Semester

ENGL 289	Technical Communications II	3
MATH 321	Differential Equations	4
PHYS 211	University Physics I	3
CSC 372	Analysis of Algorithms	3
Elective or CSC Elective ¹		3
TOTAL		16

For More Information contact:

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Second Semester

CSC 317	Computer Organization and Architecture	4
MATH 315	Linear Algebra	3
CSC 461	Programming Languages	4
CSC 470	Software Engineering	3
CSC Electives ¹		3
TOTAL		17

SENIOR YEAR

First Semester

CSC 465	Senior Design I	2
CSC 484	Database Mgmt. Systems	3
CSC 421	Graphical User Interfaces	3
Humanities or Social Sciences Elective(s) ¹		4
Free Elective		3
TOTAL		15

Second Semester

CSC 456	Operating Systems	4
CSC 467	Senior Design II	2
HUM 375	Computers in Society ¹	3
CSC Electives ¹		3
MATH 381	Intro. to Probability and Statistics	3
TOTAL		15

128 credits required for graduation

Curriculum Notes

- CSC 465/467 is a two-course sequence in senior design. It is expected that the course sequence will be taken in successive semesters.
- An exit exam, such as the Major Field Achievement Test in Computer Science, will be given as part of CSC 467. The overall results of this exam will be used to assess the computer science program.
- CSC 105 may not be counted toward any mathematics, computer science, or engineering degree. Other majors should consult their departments on policy regarding this course.
- MUEN 101, 121, 122 can be used to substitute for one or two of the required two physical education credits.

¹Elective courses must be chosen to satisfy the following requirements.

- Sixteen semester hours in humanities or social science. At least 6 hours must be in humanities and at least 6 hours must be in social sciences.
- Six credit hours of humanities and 6 credit hours of social science must be completed within the first 64 hours. It is important to refer to the general education requirements under bachelor of science graduation requirements for further information.
- Thirty total hours in humanities, social science, or other nontechnical disciplines that serve to broaden the background of the student. This may include all English classes, 2 credits of physical education, and those courses used to meet requirement (1) above.
- A minimum of three computer science elective courses numbered 400 or above must be taken. A 3-credit Co-op may be substituted for one computer science elective. Special topics and independent study courses may not be used to satisfy the computer science elective requirement.
- Eleven credits of science. Students must take three science courses that count toward the major in that discipline, with two accompanying labs. These courses must be selected from at least two different disciplines, and one science course must be PHYS 211.