COMPUTER SCIENCE

The Department of Computer Science at North Dakota State University offers course work leading to bachelor’s, master’s and doctoral degrees in computer science. The Bachelor of Science program was the first in the region to be nationally accredited by the Computing Science Accreditation Board, Inc., later to merge with ABET, Inc.

Background Information

The computer science courses required for the bachelor’s degree are typically taught by our regular faculty, all of whom hold a doctoral degree. As an undergraduate student, an advisor is assigned to help in choosing electives in their particular area of interest. For students with no computer experience, we offer introductory courses in the standard curriculum for majors. Advanced undergraduate students may have the possibility to take graduate courses while completing their undergraduate program. An extensive and varied set of elective courses in every aspect of computer science is available as well.

The Program

We offer the most comprehensive and varied computer science program in the region. In the core courses required of all majors, students are offered an opportunity to study concepts, applications and implementation techniques which provide a broad and practical base both for further study and for a career in computing. The curriculum offers an opportunity for an in-depth study of topics such as artificial intelligence, software engineering, computer graphics, system simulation, computer communication networks, multimedia, operating systems and database management systems. The department is expanding offerings in software engineering and bioinformatics. Students are encouraged to choose courses from related areas, such as business, economics, engineering, mathematics, operations research and statistics to broaden their program of study. A senior capstone experience that integrates multiple areas in computer science is required and provides an opportunity to add maturity to the computer science skill set before graduation.

Top students are encouraged to inquire about the 4+1 program providing a fast track through graduate school resulting in combined Bachelor’s and Master’s degrees.

Career Opportunities

Computer scientists choose jobs in business, industry, teaching, research, agriculture, energy and other areas. They work in systems analysis, management information processing, databases, software systems, operating systems, process control systems, automation systems, simulation models, new computer design, security, encryption, gaming and development or management.

According to the Federal Bureau of Labor Statistics, software engineers, network systems and data communication analysts, computer scientists and database administrators are expected to be among the fastest growing occupations. Employment of these computer specialists is expected to increase much faster than average.

As an undergraduate student, you will find many opportunities to work part-time as a research assistant on campus, or as an intern with a local or regional business.

Graduates of our department have recently accepted employment in major national businesses and industries, including Hewlett-Packard, IBM, AT&T, CISCO Systems, Oracle, Echelon, Cargill, SGI, Microsoft, Digikey, John Deere and Thomson Reuters. Many have chosen positions in North Dakota and adjoining states. There is a large and growing need for computer professionals in North Dakota.

During the final semester of their senior year, students take part in a capstone program. The objective of the capstone program is to provide the students with an experience that brings together the technical knowledge they have acquired, while fostering valuable teamwork skills. This is accomplished by working in small teams on real life projects. Capstone projects are done in conjunction with corporate, industrial or government clients/sponsors. Some of our recent sponsors have been 3M, Appareo, ATK, CNSE, IBM, Microsoft, NISC, Noridian, John Deere, Polaris, Rockwell Collins, Sundog, Thomson Reuters, and West Corp.

The Facilities

The department is located in the newly renamed Quentin Burdick Building (formerly the Industrial Agriculture and Communications Center) along with Information Technology Services. Students have free access to a wide range of computer systems. All students have free access to full-function Internet and World Wide Web facilities.

Equipment includes clusters of UNIX workstations, high-end microcomputers, Macs, and peripheral equipment including digitizers, plotters and laser printers. The department and the University have assumed a leadership role in computer networking through the acquisition and implementation of high-bandwidth network switches on campus. The University also has entered into a six-state consortium for extremely high level networking in the Upper Midwest and connectivity to the National Science Foundation supercomputer centers. We are also a charter member of Internet 2 and have connectivity to the national VBNs research network. Residence halls are connected to the campus network, making it easy for students with computers to access remote information for course work and various investigations. The department maintains a Web server with class assignments and other information which is accessed by thousands of users each day. The University provides more than 500 computers for student use.

High School Preparation

You should have the basic college preparatory courses in high school. Courses that develop the ability to think logically, to organize and to analyze are especially recommended (e.g., algebra, geometry, trigonometry, statistics and calculus).
The Faculty
Sameer Abufariedh, Ph.D., North Dakota State University
Anne Denton, Ph.D., University of Mainz, Germany
Hyunsook Do, Ph.D., University of Nebraska, Lincoln
Wei Jin, Ph.D., University at Buffalo, New York
Jun Kong, Ph.D., University of Texas, Dallas
Dean Knudson, Ph.D., Northwestern University
Juan Li, Ph.D., University of British Columbia
Simone Ludwig, Ph.D., Brunel University, UK
Ken Magel, Ph.D., Brown University, Rhode Island
Oksana Myronovych, Ph.D., North Dakota State University
Ken Nygard, Ph.D., Virginia Polytechnic Institute
Bill Perrizo, Ph.D., University of Minnesota
Saeed Salem, Ph.D., Rensselaer Polytechnic Institute
Brian Slator, Ph.D., New Mexico State University
Vasant Ubhaya, Ph.D., University of California-Berkeley
Gursimran Walia, Ph.D., Mississippi State University
Changhui Yan, Ph.D., Iowa State University

Lecturers
Janet Fleming
Pratap Kotala
Joan Krush
Joe Latimer
Alex Radermacher

Staff
Jane Dickerson, Administrative Secretary
Carole Huber, Administrative Assistant
Betty Opheim, Administrative Secretary
Nate Olson, Systems Administrator

Sample Curriculum
General Education Requirements
First Year Experience
UNIV 189 - Skills for Academic Success.................. 1
Communication
COMM 110 - Fundamentals of Public Speaking.................. 3
ENGL 110, 120 - College Composition I, II.................. 3, 3
ENGL 321 - Writing in Technical Professions or
ENGL 324 - Writing in the Sciences.................. 3
Quantitative Reasoning
MATH 146 - Applied Calculus I (B.A.) or
MATH 165 - Calculus I (B.S.).......................... 4
Science & Technology ........................................... 10
Humanities & Fine Arts........................................... 6
Social & Behavioral Sciences................................. 6
Wellness.......................................................... 2
Cultural Diversity.................................................. 2
Global Perspective................................................. 2
Total ................................................................. 40

Major Requirements
CSCI 160, 161 - Computer Science I and II.................. 4, 4
CSCI 213 - Modern Software Development.................. 3
CSCI 222 - Discrete Mathematics.......................... 3
CSCI 313 - Software Development for Games.................. 3
CSCI 366 - Database Systems.................................. 3
CSCI 445 - Software Projects Capstone.................. 3
CSCI 489 - Social Implications of Computers.................. 3
Total ................................................................. 26

Additional Requirements (B.A. Only)
Credits
CSCI 114 - Microcomputer Packages.................. 3
CSCI 159 - Computer Science Problem Solving.................. 3
CSCI 371 - Web Scripting Languages.................. 3
CSCI 488 - Human-Computer Interaction.................. 3
COMM 260 - Principles of Internet Web-based Design.................. 3
COMM 261 - Introduction to Web Development.................. 3
STAT 330 - Introductory Statistics.................. 3
STAT 331 - Regression Analysis.................. 2
Humanities and Fine Arts Electives.................. 12
Electives.................................................. 7
Total ................................................................. 53

Additional Requirements (B.S. Only)
Credits
CSCI 336 - Theoretical Computer Science II.................. 3
CSCI 372 - Comparative Programming Languages.................. 3
CSCI 374 - Computer Organization and Architecture.................. 3
CSCI 415 - Networking & Parallel Computation.................. 3
CSCI 467 - Algorithm Analysis.................. 3
CSCI 474 - Operating Systems Concepts.................. 3
MATH 166 - Calculus II.................................. 4
STAT 367 & 368 - Probability and Statistics.................. 3, 3
Humanities & Fine Arts Electives.................. 6
Computer Science Electives.................. 9
Science Requirements.................................. 21-23
Total ................................................................. 53

CURRICULUM TOTAL ........................................... 122

This sample curriculum is not intended to serve as a curriculum guide for current students, but rather an example of course offerings for prospective students. For the curriculum requirements in effect at the time of entrance into a program, consult with an academic advisor or with the Office of Registration and Records.

For Further Information
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