



## SCHOOL OF ENGINEERING AND COMPUTING

# BACHELOR OF SCIENCE IN COMPUTER SCIENCE

### Learn the Latest Skills for Computer Science Success

Do you dream of a career in computing? Enroll in the ABET-accredited National University Bachelor of Science in Computer Science program to gain the technical and design skills you'll need to succeed in this growing field. The program balances a strong academic foundation with real-world programming assignments. Courses include object-oriented programming, data structures and algorithms, operating systems, computer communication networks, software engineering, and computer architecture. Students interested in further study can efficiently transition to the next level through the Bachelor of Science in Computer Science/Master of Science in Computer Science Transition Program.

#### Program highlights:

- Entire program can be completed online
- Apply math, algorithms, and computer science in the modeling, design, and optimization of computer systems
- Analyze problems and design the appropriate computer solutions
- Gain experience using current technical techniques, skills, and tools
- Learn to construct software systems

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## MAJOR IN COMPUTER SCIENCE

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The Bachelor of Science in Computer Science degree program provides a strong technical background for students planning to begin careers upon graduation and for those interested in graduate study in computer science. Degree requirements include courses in object-oriented programming, data structures and algorithms, operating systems, computer communication networks, software engineering, and computer architecture, as well as mathematics, statistics, and the natural sciences. The program features a rigorous academic foundation that is complemented by realistic programming assignments. Emphasis is placed on developing both the technical and design skills necessary to begin and enhance an individual's career. Graduates of this program are well prepared for immediate employment in either the computer industry or many other businesses that increasingly rely on computer science.

The Bachelor of Science in Computer Science Program Educational Objectives are as follows.

Within a few years of graduation, graduates are expected to be:

- Engaged and active as responsible professionals pursuing diverse career paths or successfully continuing their education in graduate school.
- Participating in continuing education opportunities enabling them to understand and apply new ideas and technologies in the field of computing.
- Effective communicators and team members.
- Active contributors to their community and their profession.

### Bachelor of Science in Computer Science/Master of Science in Computer Science (BSCS/MSCS) Transition Program

Students must complete graduate-level coursework taken as part of the BSCS degree with a grade of B or better. This coursework, which counts as electives, will not transfer as graduate-level credit to National University or any other institution as it is part of an undergraduate degree program. Grades earned in graduate-level courses will be calculated as part of the student's undergraduate grade point average. Students must be within completing their last six courses in their undergraduate program and have a cumulative GPA of at least a 3.00 to be eligible. Lastly, students must apply for and begin the MSCS program within six months after completing their final BSCS course. Students must complete their MSCS program within four years with no break exceeding 12 months. Students in the BSCS transition program may take up to two MSCS classes as electives during the BSCS. Students may choose from the following courses: CSC 603, CSC 605, CSC 675, CSC 606, and CSC 607. The number of courses required to earn an MSCS degree for transition program students is reduced from 12 to as few as 10 courses.

### Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling, design and optimization of computer-based systems.
- Analyze a problem and design the computing requirements appropriate to its solution.
- Implement and evaluate a computer-based system, process, component, or program to meet objectives.
- Discuss the impact of computing on individuals, organizations, and society, including ethical, legal, security, and global policy issues.
- Use current techniques, skills, and tools necessary for computing practice that supports the recognized need for continual professional development.
- Apply design and development principles in the construction of software systems.
- Function effectively on teams to accomplish a common goal.
- Demonstrate written and oral communication skills expected of a computer science professional.

### Degree Requirements

To receive a Bachelor of Science in Computer Science, students must complete at least 180 quarter units to include a minimum of 70.5 units of the University General Education requirements; 76.5 quarter units must be completed at the upper division level, and 45, including the senior project courses (CSC 480A and CSC 480B), must be taken in residence at National University. In the absence of transfer credit, students may need to take additional general electives to satisfy the total units for the degree. Students should refer to the section on undergraduate admission procedures for specific information on admission and evaluation. All students receiving an undergraduate degree in Nevada are required by state law to complete a course in Nevada Constitution.

### Prerequisites for the Major

(12 courses; 48 quarter units)

Students must select **two (2)** science related courses with labs from Area F of the General Education for a total of 12 quarter units. Students must select **one (1)** additional mathematics or science course without duplicating any of the courses in the program. The mathematics course must be beyond pre-calculus and beyond the level of MTH 215 (i.e. have MTH 215 as a prerequisite). The program director must approve your course selection.

MTH 215*	College Algebra & Trigonometry <i>Prerequisite: Accuplacer test placement evaluation or MTH 12A and MTH 12B</i>
CSC 208*	Calculus for Comp. Science I <i>Prerequisite: MTH 215</i>
CSC 209	Calculus for Comp. Science II <i>Prerequisite: CSC 208</i>
CSC 220	Applied Probability & Stats. <i>Prerequisite: MTH 215</i>
CSC 242*	Intro to Programming Concepts <i>Prerequisite: MTH 215</i>
CSC 252*	Programming in C++ <i>Prerequisite: CSC 242</i>
CSC 262*	Programming in JAVA <i>Prerequisite: MTH 215</i>

\* May be used to meet a General Education requirement.

### Requirements for the Major

(17 courses; 70.5 quarter units)

CSC 300	Object Oriented Design <i>Prerequisite: CSC 252</i>
CSC 310	Linear Algebra and Matrix Comp <i>Prerequisite: CSC 300</i>
EGR 320	Scientific Problem Solving <i>Prerequisite: CSC 208 or EGR 220</i>
EGR 320L	Scientific Problem Solving-LAB (1.5 quarter units) <i>Prerequisite: EGR 320</i>
CSC 331	Discrete Structures and Logic <i>Prerequisite: CSC 252 and CSC 310</i>
CSC 335	Data Structures and Algorithms <i>Prerequisite: CSC 300 and CSC 331</i>
CSC 338	Algorithm Design <i>Prerequisite: CSC 335</i>
CSC 340	Digital Logic Design <i>Prerequisite: CSC 208 or EGR 220, Corequisite: CSC 340L</i>
CSC 340L	Digital Logic Design Lab (1.5 quarter units) <i>Corequisite: CSC 340</i>
CSC 342	Computer Architecture <i>Prerequisite: CSC 340 and CSC 340L</i>
CSC 350	Computer Ethics
CSC 400	OS Theory and Design <i>Prerequisite: CSC 335</i>
CSC 422	Database Design <i>Prerequisite: CSC 300</i>
CSC 430	Programming Languages <i>Prerequisite: CSC 300</i>
CSC 436	Comp. Communication Networks <i>Prerequisite: CSC 335 or CSC 340 and CSC 340L</i>
CSC 480A	Computer Science Project I <i>Prerequisite: Completion of core courses</i>
CSC 480B	Computer Science Project II <i>Prerequisite: CSC 480A</i>

### Approved Electives

(2 courses; 9 quarter units)

Students must complete **two (2)** 400-level technical electives. These electives can be taken from the computer science, computer information systems, or information technology management programs without duplicating any of the courses in the computer science major. Permission of the Academic Program Director is required.