NATIONAL UNIVERSITY

SCHOOL OF ENGINEERING AND COMPUTING

MASTER OF SCIENCE IN COMPUTER SCIENCE

Skills for a Career in Computer Science

In the Master of Science in Computer Science (MSCS) program at National University, you'll learn to combine the fundamental knowledge and best practices for software engineering, database theory and design, and cloud computing. You'll then have the opportunity to use those skills to solve real-world problems. Besides its comprehensive immersion in computing foundations, what sets this program apart is its emphasis on developing essential communication skills so you'll be able to clearly discuss issues, trends, and solutions with both technical and non-technical audiences.

This online program offers specializations in several advanced areas, a three-month project solving a real problem for a real client against a deadline, and training that reflects current and future industry needs. MSCS graduates are prepared to assume a leadership role in the field.

Program highlights:

- Entire program can be completed online
- Create software requirements specifications, and design and develop complex software systems
- Evaluate computer security vulnerabilities, threats, and counter measures that are effective and ethical
- Analyze and design complex front-end applications for cloud and client-server architectures and integrate them with backend databases
- Demonstrate critical thinking and ability to analyze and synthesize computer science concepts and skills with ethical standards

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MASTER OF SCIENCE IN COMPUTER SCIENCE

Academic Program Director: Mudasser Wyne; (858) 309-3433; mwyne@nu.edu

The Master of Science in Computer Science (MSCS) degree program at National University provides students with a solid foundation in advanced programming, operating systems, computer security, user interface design, software engineering, and database design and implementation. The program exposes students to best practice methodologies using a variety of tools and techniques required for solving real-world problems. National University's computer science students are taught to put theory into practice thus preparing them for the fast-growing, rapidly evolving opportunities in the field. MSCS students will complete a three-course capstone project in which they apply what they have learned to solve some of the current technological problems facing society today. In addition, graduates are prepared to clearly discuss issues, trends, and solutions with both technical and non-technical audiences. Every part of the curriculum is devoted to developing required communication skills, ethics, and standards of professionalism.

The Master of Science in Computer Science (MSCS) curriculum is designed for professionals currently working in business, government, or industry who want to advance their careers. People without a previous computer science degree who want to prepare for a career as a working computer science professional can meet with an advisor to discuss pathways into the program. National University's approach prepares graduates to immediately become highly productive members of a real-world computing team.

INTEGRATION

Three master's project classes provide an integrating mechanism for acquiring realistic experience through building a computationally complex project. It is a three-month project solving a real problem for a real client against a time deadline using all available tools and resources as students work together in teams. This component addresses the need to integrate a broad range of technologies and skills. Students are given the opportunity to crystallize the ideas learned earlier and to implement comprehensive systems across an organization.

Career Tracks

In the MSCS program, graduates are proficient in analytical and critical thinking skills, have a sense of professionalism, and are instilled with a strong set of values essential for success in computer science. This program reflects current and future industry needs, and graduates are trained and prepared to assume a leadership role in the field.

Admission Requirements

Candidates seeking admission to the program should possess a baccalaureate degree in Computer Science (CS), Computer Engineering (CE), Software Engineering (SE), or Information Systems (IS). Students from other undergraduate majors can fulfill the program prerequisites either by taking CSC 242, CSC 252 and CSC 262 or by demonstrating proficiency through additional equivalent coursework or taking a course challenge exam for CSC 242, CSC 252 and CSC 262 before starting the MSCS program.

MSCS Transition Program

National University students who completed a transition program as part of their undergraduate degree and who satisfy MSCS transition program requirements described in the catalog must complete a minimum of 45 quarter units for their MSCS degree. The number of units required for the MSCS program is dependent on the coursework completed in the bachelor's transition program and the grades earned.

Program Learning Outcomes

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

- Create software requirements specifications, and design and develop complex software systems.
- Evaluate computer security vulnerabilities and threats, and counter measures that are effective and ethical.
- Analyze, design and develop database solutions by translating database modeling theory into sound database design and implementation.
- Analyze and design complex front-end applications and integrate them with backend databases.
- Compare and contrast computing concepts and systems.
- Demonstrate ability to conduct in-depth research, both individually as well as in teams, in a specific computer science area.
- Demonstrate critical thinking and ability to analyze and synthesize computer science concepts and skills with ethical standards.

Degree Requirements

To receive a Master of Science in Computer Science, students must complete 58.5 quarter units of graduate coursework. A total of 13.5 quarter units of graduate credit may be granted for equivalent graduate work completed at another accredited institution, as it applies to this degree, and provided the units were not used in earning another advanced degree. The degree program consists of ten courses and a three-part MSCS graduate project (three courses, 4.5 quarter units each) that cannot be taken until CSC 603, CSC 607, CSC 670 and CSC 680 courses have been completed. It is important to note that capstone course sequence CSC 686, CSC 687 and CSC 688 needs to be taken in the consecutive months. In case a student is not able to complete this course sequence in consecutive months, he/she will be required to start with the CSC 686 course in the future, whenever this course sequence is offered.

Program Prerequisites

(3 courses; 13.5 quarter units)

Candidates seeking admission to the program should possess a baccalaureate degree in Computer Science (CS), Computer Engineering (CE), Software Engineering (SE), or Information Systems (IS). Students from other undergraduate majors can fulfill the program prerequisites either by taking CSC 242, CSC 252 and CSC 262 courses or by demonstrating proficiency through additional equivalent coursework or taking a course challenge exam for CSC 242, CSC 252 and CSC 262 before starting MSCS program.

CSC 242	Intro to Programming Concepts *Prerequisite: MTH 215*
CSC 252	Programming in C++ *Prerequisite: CSC 242*
CSC 262	Programming in JAVA *Prerequisite: MTH 215*

Core Requirements

(13 courses; 58.5 quarter units)

CSC 600	Advanced Programming *Prerequisite: CSC 242, CSC 252 and CSC 262*
CSC 603	Software Eng. Fundamentals
CSC 605	Software Architecture Principl. *Prerequisite: CSC 603*
CSC 606	Modern Operating Systems *Prerequisite: CSC 600*
CSC 607	Security in Computing *Prerequisite: CSC 606*
CSC 670	User Interface Engineering *Prerequisite: CSC 600*
CSC 675	Database Design and Impl. *Prerequisite: CSC 600*
CSC 678	Advanced Database Programming *Prerequisite: CSC 675*
CSC 680	Database Web Interface *Prerequisite: CSC 678*
CSC 685	Topics in Computing
CSC 686	Computer Science Project I *Prerequisite: CSC 605, CSC 607, CSC 670 and CSC 680*
CSC 687	Computer Science Project II *Prerequisite: CSC 686*
CSC 688	Computer Science Project III *Prerequisite: CSC 687*