






SCHOOL OF ENGINEERING AND TECHNOLOGY

NATIONAL UNIVERSITY

The University of Values

- CONVENIENT LOCATIONS 
- ONE COURSE PER MONTH 
- EVENING CLASSES 
- ON CAMPUS AND ONLINE 
- NONPROFIT UNIVERSITY 



NOW ENROLLING!

Earn your Master of Science degree in Computer Science at National University

SKILL COURSES

This set of courses is designed for acquisition of marketable skills. They reflect the demands in the computer industry:

- Analysis, modeling, design, and development
- Computational tools and processes
- Operating Systems and Languages
- Data Base Systems
- Applications Systems and Graphical User Interfaces
- Artificial Intelligence
- Computational Problem Solving

800.NAT.UNIV | www.nu.edu



Master of Science in Computer Science

UPGRADE YOUR COMPUTER SKILLS AND YOUR CAREER

The Master of Science in Computer Science (MSCS) program will provide you with the mathematical foundations and information processing skills required for solving real world problems.

National University's MSCS program not only prepares you in the theoretical and practical aspects of solving complex computing problems, but we also develop other essential communication skills. You will learn to discuss issues clearly with both technical and non-technical audiences. In addition to those communication skills, you will develop outstanding "people skills," ethics, and standards of professionalism.

When completed, National's MSCS program ensures your proficiency in analytical and critical thinking skills. You will learn a sense of professionalism, instilled with a strong set of values essential for success in the computer science field. This program reflects current and future industry needs. Graduates from the MSCS program are trained and prepared to assume a leadership role in the field.

Contact an Admissions Advisor today

Learn more! Call or visit **800.NAT.UNIV**
www.nu.edu

■ MASTER OF SCIENCE IN COMPUTER SCIENCE

Faculty Advisors: Pradip Peter Dey; (858) 309-3421; pdey@nu.edu and Mudasser F. Wyne (858) 309 3433 mwyne@nu.edu

The Master of Science in Computer Science (MSCS) program at National University provides students with a solid foundation, in the fundamental knowledge and skills of software engineering, database theory and design and cloud computing, exposing them to best practice methodologies using a variety of tools and techniques required for solving real world problems and to be of immediate benefit to the computing industry.

National University's MSCS program not only prepares students in the theoretical and practical aspects of solving complex computing problems but also it develops other essential communication skills. MSCS graduates are able to clearly discuss issues, trends, and solutions with both technical and non-technical audiences. In addition, every part of the curriculum is devoted towards developing "people skills," ethics, and standards of professionalism.

The rigorous scientific and analytical techniques taught in the MSCS program have four primary goals: (1) to provide a clear understanding of scope and limitations of computational models, (2) to facilitate acquisition of marketable skills throughout the program, (3) to facilitate logical discussion of concepts, trends and issues including cloud computing and security in computing, and underlying problem solving strategies, and (4) to facilitate lifelong learning. National University's approach to teaching in the MSCS program allows graduates to immediately become highly productive members of a real-world computing team.

Specializations

After acquisition of common fundamental concepts, students select one of the following three specializations in order to concentrate on specialized knowledge and skills in one of the advanced areas: (1) Advanced Computing, (2) Software Engineering, and (3) Database Engineering.

Integration

The two 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), Software Engineering (SE), Information Systems (IS), Information Technology (IT) or a closely related area. Non-CS students should fulfill the program prerequisites either through additional equivalent coursework or waiver through a course challenge exam.

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 description of various undergraduate programs 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 Bachelors 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

countermeasures 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 for cloud and client-server architectures and integrate them with backend databases.
- Compare & contrast alternative systems for process and memory management.
- 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 (14 courses; 63 quarter units)

To receive a Master of Science in Computer Science, students must complete 54 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 plus the two-part MSCS graduate project (two courses, 4.5 quarter units each) that cannot be taken until all other courses have been completed.

Program Prerequisites (2 courses; 9 quarter units)

Students with non-computer related baccalaureate degrees can qualify for admission to the program by choosing one or a combination of the following options:

Complete the following prerequisites:

CSC 252 Programming in C++

Prerequisite: CSC 242

CSC 300 Object Oriented Design

Prerequisite: CSC 252

or

Gain permission of the lead faculty of the MSCS program based on equivalent coursework supported by verifiable documented proof.

Core Requirements (8 courses, 36 quarter units)

SEN 601 Software Eng Fundamentals

SEN 602 Software Architecture Prncipl

Prerequisite: SEN 601 or approval of lead faculty.

DAT 604 Database Design and Impl.

DAT 605 Web and Cloud Computing

Prerequisite: DAT 604 or approval of lead faculty.

CSC 606 Modern Operating Systems

CSC 607 Security in Computing

CSC 686 Computer Science Project I

Prerequisite: Completion of all MSCS core courses or permission of the instructor.

CSC 687 Computer Science Project II

Prerequisite: CSC 686

Requirements for the Specialization (4 courses; 18 quarter units)

All students must choose one Specialization defined below:

▲ Specialization in Advanced Computing

Students in this specialization learn to solve computational problems combining mathematical modeling, domain analysis, information processing techniques, and user interface engineering

▲ Specialization in Database Engineering

Students in this specialization learn to solve complex database problems combining analysis, design, implementation and testing techniques.

▲ Specialization in Software Engineering

Students in this specialization learn to solve complex software engineering problems combining analysis, design, implementation and testing techniques and user interface engineering.

 Entire program can be completed online.

For more complete information, see the National University General Catalog 74, published 8/30/10