

NAVAL POSTGRADUATE SCHOOL
Monterey, California

*Department of Electrical &
Computer Engineering*

November 1, 1999

Master of Science in Computer Engineering (MSCE)

Purpose: The MSCE program provides both a broad-based education in traditional computer hardware and software related subjects while at the same time concentrating on military-relevant Computer Engineering topics such as Computer Security, High-Speed Networking, Distributed and Parallel computing, and Fault Tolerant computing.

Eligibility: All students of the Naval Postgraduate School are required to be military officers or government employees sponsored by an element of the U.S. Government. Employees of the Naval Postgraduate School are also eligible to pursue degrees on a part-time basis with the approval of their supervisor and the department chairperson.

Applications: Students in residence at NPS apply through their curriculum officer. Those applying from outside NPS should contact the Director of Admissions, Code 62, for application procedures.

Entrance Requirements: The entrance requirements are patterned after and similar to the ABET-approved requirements specified by the ECE department for the MSEE degree.

1. An ABET-accredited Bachelor of Science in Computer Engineering (BSCE) degree.
2. For students without a BSCE, a bachelor's degree in any subject and fulfillment of BSCE equivalency requirements.

BSCE Equivalency Requirements: The equivalency requirements are patterned after and similar to the ABET-approved requirements specified by the ECE Department for the BSEE equivalency. BSCE equivalency will be certified by the Academic Associate(s) for the ECE Department.

1. Completion of at least 24 quarter credit hours or 16 semester credit hours of mathematics, covering the following subjects.
 - a) Differential Calculus
 - b) Integral Calculus
 - c) Differential Equations
 - d) Discrete Mathematics
 - e) Linear Algebra
 - f) Probability and Statistics

2. Completion of at least 24 quarter credit hours or 16 semester credit hours of basic science.
 - a) Completion of at least one course in calculus-based physics.
 - b) Completion of at least one course in chemistry.
 - c) Completion of a second course in either physics or chemistry that builds on either course in a and b, above.
3. Completion of at least 24 quarter credit hours or 16 semester credit hours of humanities and social sciences.
4. Completion of at least 48 quarter credit hours or 32 semester credit hours of engineering science.
5. Completion of at least 24 quarter credit hours or 16 semester credit hours of engineering design.
6. Completion of computer engineering, electrical engineering, or computer science courses that cover the following subjects:
 - Electronic Circuits (such as EC2200)
 - Logic Design (such as EC2820)
 - Assembly Language Programming (such as EC2840)
 - Microprocessor Systems Design (such as EC3800)
 - Computer Architecture (such as EC3840)
 - Communications Theory (such as EC2500)
 - Data Structures (such as CS3301)
 - Operating Systems (such as CS3450)
 - Compilers or Programming Languages (such as CS3111 or CS3112)
 - Software Engineering Principles (such as CS3460)

Degree Requirements: The requirements are patterned after and similar to the ABET-approved requirements specified by the ECE Department for the MSEE degree. All NPS requirements for graduation with a Masters degree are also met.

1. Completion of the sequence of five graded core courses in Computer Engineering
 - EC3830 Digital Computer Design Methodology
 - EC3850 Computer Communications Methods
 - EC4820 Advanced Computer Architecture or CS4450 Advanced Computer Architecture
 - CS4112 Distributed Systems
 - CS3600 Computer Security

2. Completion of at least three graded 3000- or 4000-level courses from the Computer Engineering electives course list.
 - a) Completion of at least one graded 3000- or 4000-level course from the Hardware (H) group of the Computer Engineering electives course list.
 - b) Completion of at least one graded 3000- or 4000-level course from the Software (S) group of the Computer Engineering electives course list.
3. Completion of at least two graded courses at the 3000- or 4000-level that are not EC, EO, or CS courses.
 - a) Completion of at least one graded mathematics course of at least 3 units at the 3000- or 4000-level.
4. Completion of at least 36 quarter credit hours at the 3000- and 4000-level.
 - a) Completion of at least 24 graded quarter credit hours at the 3000- and 4000-level in EC, or CS courses.
 - b) Completion of at least 12 quarter credit hours and at least four courses at the 4000-level, of which at least three courses must be graded.
5. Completion of a thesis of appropriate depth and length, including 16 units of CS0810 (see next section).

Computer Engineering Elective Courses:

Hardware (H) Group

EC3200 Advanced Electronics Engineering
 EC3510 Communications Engineering
 EC4550 Digital Communications
 EC4560 Communications ECCM
 EC4810 Fault Tolerant Computing
 EC4830 Digital Computer Design
 EC4840 Advanced Microprocessors
 EC4850 High Speed Networking
 EC4870 VLSI Systems Design

Software (S) Group

CS3502 Computer Communications and Networks
 EC3820 Computer Systems, or
 CS4920 Advanced Topics in Computer Science
 CS3690 Network Security
 CS4314 Logic and Functional Programming

CS4451 Symbolic Computing
CS4520 Advanced Software Engineering
CS4550 Computer Networks II
CS4600 Secure Systems
CS4605 Security Policies, Models, and Formal Methods

Systems and Theory (Y) Group

CS3202 Introduction to Multimedia Production
CS3601 Theory of Formal Languages and Automata
CS3650 Design and Analysis of Algorithms
CS4313 Advanced Robotic Systems
EC4580 Coding and Information Theory

Recommended Mathematics Courses Related to Computer Engineering

MA3026 Discrete Mathematics with Applications
MA3232 Numerical Analysis
MA3046 Matrix Analysis
MA4027 Graph Theory and Applications

Thesis Requirement: Although the thesis research need not necessarily represent a contribution to fundamental knowledge, it must demonstrate the student's ability to identify and solve an accepted problem in the area of computer engineering and to report work in a document of acceptable literary quality. The appropriateness of the topic is determined by the advisor, second reader, and department chairperson. An ECE faculty member must serve as either advisor or co-advisor. Approval of the thesis topic and scope of the thesis is obtained through the preparation and approval of a Thesis Approval Form. At the conclusion of the research work and thesis preparation, the student must present an oral summary of the project and its results to the faculty and interested students at a department seminar or other public forum.

Program Approval: For help in setting up a program or in answering any questions, see the ECE faculty liaison. After establishing a valid program with the help of the ECE faculty liaison, the program must receive the signed approval of the Chairperson of the Department of Electrical and Computer Engineering.