



Engineering Online

@ **NC STATE UNIVERSITY**



Master of Science in Electrical Engineering
Master of Science in Computer Engineering

Program Overview

The Department of Electrical and Computer Engineering has created two new distance education degree programs to address the needs of students whose work schedule, family life or geographic location prohibits them from attending on campus classes. The Master of Science in Electrical Engineering and Master of Science in Computer Engineering online degrees are the same degrees as offered to on campus students, but the lectures are delivered in an asynchronous mode. There is no on-campus residency requirement. Class lectures presented to an on-campus class by NC State faculty are captured, digitized and placed on the Internet for distance students to view at any time and from any location that has high speed Internet connection. Course assignments, lecture notes, and handouts are also made available to distance students on the course web site. Online courses are identical to on-campus courses in terms of content, requirements and academic rigor.

Engineering Online is a program administered in the Office of Distance Education in the College of Engineering. Engineering Online has a well-established infrastructure for assisting students with the daily logistics of distance courses. This includes assistance in ordering textbooks, delivery of lectures, frequent posting of course materials, and sending and receiving assignments. Convenience and flexibility are the key advantages of the course work for the degree which can be earned totally through the Engineering Online program.

Admission Requirements

The minimum requirements for admissions to the graduate degree program in Electrical Engineering or Computer Engineering are as follows:

- A bachelor's degree from an accredited college or university in electrical engineering or computer engineering.
- An overall GPA of at least 3.25/4.00. Persons with a 3.0 GPA may be admitted on a provisional basis.
- Students who graduated from an ABET accredited program do not need to take the GRE. Those from international universities should consult the ECE Graduate handbook for GRE guidelines at <http://www.ece.ncsu.edu/academics/grad/handbook.pdf>.
- Three strong recommendations from persons able to comment on the applicant's qualification for graduate study.
- The Graduate School requires that all international applicants take the TOEFL examination unless they have completed one year of study at a university in the U.S., Canada, or Great Britain. The TOEFL must have been taken within two years of receipt of application.

Student who do not have a bachelor's degree from an accredited college or university in electrical engineering or computer engineering must satisfy the following requirements:

Applicants for M.S. in electrical engineering must have completed courses equivalent to:

- ECE 109 – Introduction to Computer Systems
- ECE 209 – Computer Systems Programming

- ECE 212 – Fundamentals of Logic Design
- ECE 220 - Analytical Foundations of Electrical and Computer Engineering
- ECE 301 – Linear Systems
- ECE 302 – Microelectronics
- ECE 303 – Electromagnetic Fields
- ECE 305 or ECE 403
- Three semesters of calculus
- One semester of probability/statistics
- Two semesters of calculus-based physics
- One semester of chemistry

Applicants for the M.S. in computer engineering must have completed courses equivalent to

- ECE 109 - Introduction to Computer Systems
- ECE 209 - Computer Systems Programming
- ECE 212 - Fundamentals of Logic Design
- ECE 220 - Analytical Foundations of Electrical and Computer Engineering
- ECE 301 – Linear Systems
- ECE 302 - Microelectronics
- Three semesters of calculus
- One semester of probability/statistics
- Two semesters of calculus-based physics
- One semester of chemistry

Degree Requirements

Master of Science in Electrical Engineering

- Completion of 21 of the required 30 hours (ten courses) in ECE. The program will require both breadth and depth in the EE discipline.
- Breadth will be achieved by completing at least one course from three specialty areas listed in the table of courses.
- Two advanced ECE courses at the 700-level in EE specialty areas will be required to achieve the depth.
- Students can take up to three courses (the remaining nine hours of the program) outside of ECE, including math and other courses offered through the college's Engineering Online program.
- Students must maintain a minimum 3.0 out of 4.0 GPA.
- After a student has been admitted and enrolls for the first time, he/she is required to maintain continuous enrollment in each fall and spring semesters until completion of the degree program. A student in good academic standing may request a leave of absence for good reasons from the Director of Graduate Programs in ECE. The leave absolutely may not exceed two semesters.

Master of Science in Computer Engineering

- Completion of 21 of the required 30 hours (ten courses) in ECE. The program will require both breadth and depth in the CPE discipline.
- Breadth will be achieved by completing at least one course from three specialty areas listed in the table of courses.
- Two advanced ECE courses at the 700-level in CPE specialty areas will be required to achieve the depth.
- Students can take up to three courses (the remaining nine hours of the program) outside of ECE, including math and other courses offered through the college's Engineering Online program.
- Students must maintain a minimum 3.0 out of 4.0 GPA.

- After a student has been admitted and enrolls for the first time, he/she is required to maintain continuous enrollment in each fall and spring semesters until completion of the degree program. A student in good academic standing may request a leave of absence for good reasons from the Director of Graduate Programs in ECE. The leave absolutely may not exceed two semesters.

Course Registration

It is preferable to seek admission to the MSEE or MSCPE program as soon as possible to assure integration into the advising process. However, a person does not have to be admitted to a degree program to enroll in an online credit course. Prior to applying to Graduate School, a qualified individual may enroll in Engineering Online courses as a Post-Baccalaureate Studies (PBS) student. The PBS classification is designed for U.S. citizens or permanent residents who wish to undertake academic work beyond the baccalaureate degree but who are not currently admitted to a degree program. If the student is admitted to the MSEE or MSCPE program, a maximum of twelve hours of transfer and PBS credits (B or better in each course; not a B-) may apply toward the 30 credit hour degree requirement.

Students must register for online courses through Engineering Online at <http://EngineeringOnline.ncsu.edu>. Click on the “Registration” link. Students cannot register through the university’s Pack Tracks registration system for an online course in engineering.

Course Offerings

A list of distance education courses available for each semester can be found on the Engineering Online website listed above. Full-time employed individuals can only enroll in two online courses per semester. It is highly recommended that new students enroll in only one online course during their first semester.

The following courses will be available through the Engineering Online program in various semesters.

Course	Title	Track	Specialty
ECE 506	Architecture of Parallel Computers	CPE	Computer Architecture
ECE 511	Analog Electronics	EE	Circuits
ECE 513	Digital Signal Processing	EE	Signal Processing
ECE 514	Random Processing	EE	None
ECE 515	Digital Communications	EE	Communications
ECE 516	System Control Engineering	EE	Robotics, Mechatronics, Control
ECE 517	Object-Oriented Language Systems	CPE	Software
ECE 520	Digital ASIC Design	CPE	VLSI Systems
ECE 521	Digital Computer Technology & Design	CPE	Computer Architecture
ECE 528	Semiconductor Characterization	EE	Nanoelectronics and Photonics
ECE 535	Design of Electromechanical Systems	EE	None
ECE 538	Integrated Circuit Technology and Fabrication	EE	Nanoelectronics and Photonics
ECE 540	Electromagnetic Fields	EE	Microwave Circuits & Applied Electromagnetics

ECE 544	Design of Electronic Packaging and Interconnects	EE	None
ECE 546	VLSI Design Systems	CPE	VLSI Systems
ECE 549	RF Wireless Design	EE	Microwave Circuits & Applied Electromagnetics
ECE 556	Agent-based Mechatronics Systems	EE	Robotics, Mechatronics, Control
ECE 570	Computer Networks	CPE	Networking
ECE 576	Connection-Oriented Networks	CPE	Networking
ECE 579	Introduction to Computer Performance Modeling	CPE	Networking
ECE 582	Wireless Communication Systems	EE	Communications
ECE 703	Instrumentation Circuits	EE	Circuits
ECE 718	Computer-aided Circuit Analysis	EE	Circuits
ECE 719	Microwave Circuit Design	EE	Microwave Circuits & Applied Electromagnetics
ECE 723	Optical Properties of Semiconductors	EE	Nanoelectronics and Photonics
ECE 733	Digital Electronics	EE	Circuits
ECE 756	Advanced Mechatronics	EE	Robotics, Mechatronics, Control
ECE 776	Design and Performance Evaluation of Network Systems and Services	CPE	Networking
ECE 792X	Integrated Circuit Design for Wireless Communications	EE	Circuits
ECE 792D	Data Converters	EE	Circuits

Contact Information

- For more information about the MSEE or MSCPE degree programs available online, consult the ECE Graduate Student Handbook – <http://www.ece.ncsu.edu/academics/grad/handbook.pdf> or contact:

Office of Graduate Programs in Electrical and Computer Engineering

Telephone: 919.515.5091

Email: ece_grad_office@ncsu.edu

- For more information about the registration process and course offerings, contact:

Dr. Linda Krute, Director

Engineering Online

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