M.S. in Electrical Engineering

Degree Requirements

The MS EE program at NJIT is flexible and customizable to a student's individual goals. It allows students to pursue electrical engineering disciplines in depth, as well as to take a selection of courses from other NJIT engineering, computer science or management majors. The program provides in-depth studies of modern engineering topics including physical devices, circuits and systems, communications and networking, signal, information and data processing. BS EE degree (or equivalent) is a general enrollment requirement.

Program Requirements and Options

Upon entering the program, students select an area of specialization supervised by the MS EE Program Advisor. The master's program consists of 30 credits. There are three program options: 24 course credits and 6 credits of master's thesis; or 27 course credits and 3 credits of master's project; or 30 course credits not to include either a master's project or thesis. Students should consult with the Program Advisor or designee before registering for courses to make sure they are meeting degree requirements. As a requirement for graduation, students must achieve a 3.0 cumulative GPA in graduate-level courses not including the master's thesis. Courses at the 500-or-below level are not acceptable for credit toward a graduate degree in electrical engineering.

Additional Thesis Option:

With permission of their research advisor, MS EE students intending to do an MS thesis may first register in the 700B MS Project course; They must receive a satisfactory (S) grade in 700B before 701B MS Thesis registration in the immediate following semester with the same advisor. The MS thesis topic should be continuation of the work done in 700B.

Bridge Program

Students who lack an appropriate background may be admitted and be required to take selected courses in addition to the degree requirements in order to make up deficiencies. They must attain a grade of B or better in each course. At the discretion of the department, students who have taken courses equivalent to these may have their bridge programs reduced accordingly.

Code	Title	Credits
MS EE Bridge Courses		
ECE 321	Random Signals and Noise	3
ECE 232	Circuits and Systems II	3
ECE 333	Signals and Systems	3
ECE 361	Electromagnetic Fields	3
ECE 362	Electromagnetic Waves Propagation	3
ECE 372	Electronic Circuits II	3
Total Credits		**18**

Code	Title	Credits
MS EE Required Core Courses		
ECE 601	Linear Systems	3
ECE 673	Random Signal Analysis	3
Total Credits		**6**

ECE Department Focused Areas:

Communications, Signal Processing and Microwave; Computer Networking; Computer Architecture; Solid State, VLSI and Electro-optics Systems; Intelligent Systems.

Students need to contact the MS EE Program Adviser or designee for guidance and suggested courses for different focus areas. Two non-ECE graduate courses of 600 level may be chosen and must be approved as not all outside ECE department courses are applied for MS EE.

Code	Title	Credits
Recommended MS EE Technical Electives – total 8 courses/24 credits		
(additional courses including those in Computer Science and Management can be selected and approved by the program advisor)		
ECE 605	Discrete Event Dynamic Systems	3
ECE 610	Power System Steady-State Analysis	3
ECE 611	Transients in Power Systems	3

ECE 613	Protection of Power Systems	3
ECE 616	Power Electronics	3
ECE 617	Economic Control of Interconnected Power Systems	3
ECE 618	Photovoltaic Semiconductors and Renewable Energy	3
ECE 619	Intelligent Sensing for Smart Grid and Smart City	3
ECE 626	Optoelectronics - Nonlinear Modulators for Optical Communication	3
ECE 636	Computer Networking Laboratory	3
ECE 637	Internet and Higher-Layer Protocols	3
ECE 640	Digital Signal and Data Processing	3
ECE 641	Laboratory for High Performance Digital Signal Processing	3
ECE 642	Introduction to Communication Systems: Evolution to 5G and Beyond	3
ECE 644	Wireless Communications: Fundamentals to 5G	3
ECE 645	Design of Wireless Networks: 5G Architecture and Services	3
ECE 657	Semiconductor Devices	3
ECE 658	VLSI Design I	3
ECE 660	Control Systems I	3
ECE 661	Control System Components	3
ECE 664	Applied Advanced Control Systems	3
ECE 681	High-Performance Network Function, Data Center, and Virtualization	3
ECE 683	Cloud and IoT Networking and Security	3
ECE 684	Advanced Microprocessor Systems	3
ECE 690	Computer Systems Architecture	3
ECE 692	Embedded Computing Systems	3
ECE 698	Selected Topics in Electrical and Computer Engineering	3
ECE 744	Optimization for Data Engineering	3
ECE 754	Statistical Machine Learning for Engineers and Data Scientists	3
ECE 758	VLSI Design II	3
ECE 760	Control Systems II	3
ECE 776	Information Theory	3
ECE 783	Computer Communication Networks	3
ECE 788	Selected Topics in Electrical and Computer Engineering	3
Project		
ECE 700B	Master's Project	3
Thesis		
ECE 701B	Master's Thesis	3
ECE 791	Graduate Seminar [1]	0

[1] Not Mandatory for MS Students