

MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

The purpose of this degree is to prepare students for advanced study and industry in the field of electrical engineering. The Master of Science in Electrical Engineering (M.S.E.E.) is a degree program combining breadth across several areas of study within electrical engineering and specialization within one area, which includes an option to pursue thesis research under the guidance of a faculty adviser. Areas of study include communication and signal processing, computers and microelectronics, and power and control systems. The program is normally completed in three semesters of full-time study.

The admission requirements for this degree follow the existing admission requirements for master's degrees in the ECE department. Students whose accredited B.S. degree is not in electrical engineering may pursue the M.S.E.E., provided that they have an adequate background and can demonstrate proficiency in the material contained in undergraduate courses equivalent to Illinois Institute of Technology's:

ECE 211	Circuit Analysis I	3
ECE 213	Circuit Analysis II	4
ECE 218	Digital Systems	4
ECE 307	Electrodynamics	4
ECE 308	Signals and Systems	3
ECE 311	Engineering Electronics	4
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4

A student may demonstrate proficiency by successfully completing the courses or by satisfactory performance in one or more special examinations administered by the department.

The program of study includes a minimum of 32 credit hours of acceptable graduate coursework, with a minimum of 20 credit hours of ECE courses at the 500-level or higher. Up to six credit hours of ECE short courses may be applied to the degree.

Students, with adviser approval, select courses appropriate to their needs and interests. The program of study must include a minimum of four courses within one of the electrical engineering (EE) areas of concentration and a minimum of two courses from the other areas. An M.S.E.E. candidate may, with permission of a thesis adviser, include in their program a thesis of six to eight credit hours. The master's thesis is recommended for pre-doctoral students. The thesis option requires a written thesis and an oral defense of the thesis. Thesis format and deadlines are set by the Graduate College.

Master of Science in Electrical Engineering (Coursework Only Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	12
Minimum 500-Level ECE Credit	20
Maximum 700-Level Credit	6
Maximum Transfer Credit	9

Code	Title	Credit Hours
Electrical Engineering Major Courses		(12-16)
Select four courses from the chosen EE area of concentration from the lists below (p. 2)		12-16
Electrical Engineering Minor Electives		(6-8)
Select two courses from either or both of the remaining EE areas of concentration (p. 2)		6-8
General Electives		(10-14)
Select 10-14 credit hours of general ECE electives		10-14

Master of Science in Electrical Engineering (Thesis Option)

Requirement	Credits
Minimum Credits Required	32
Maximum 400-Level Credit	12
Minimum 500-Level ECE Credit	20
Maximum 700-Level Credit	6
Maximum Transfer Credit	9

Code	Title	Credit Hours
Electrical Engineering Major Courses		(12-16)
Select four courses from the chosen EE area of concentration from the lists below (p. 2)		12-16
Electrical Engineering Minor Electives		(6-8)
Select two courses from either or both of the remaining EE areas of concentration (p. 2)		6-8
General Electives		(0-8)
Select zero to eight credit hours of general ECE electives		0-8
Thesis Research		(6-8)
ECE 591	Research and Thesis M.S. ¹	6-8

¹ Students pursuing the thesis option must complete six to eight credit hours of research work (ECE 591) leading to an M.S. dissertation with the approval of a thesis adviser.

EE Areas of Concentration

Communications and Signal Processing

Code	Title	Credit Hours
ECE 401	Communication Electronics	3
ECE 403	Digital & Data Comm Systems	3
ECE 405	Digital & Data Comm Syst w/Lab	4
ECE 406	Intro to Wireless Comm Systems	3
ECE 421	Microwave Circuits and Systems	3
ECE 423	Microwave Crct&Systs w/Lab	4
ECE 436	Digital Signal Pcsgr w/Lab	4
ECE 437	Digital Signal Processing I	3
ECE 481	Image Processing	3
ECE 504	Wireless Comm System Design	3
ECE 507	Imaging Theory & Applications	3
ECE 508	Video Processing & Comm	3
ECE 509	Electromagnetic Field Theory	3
ECE 511	Analysis Random Signals	3
ECE 513	Commctn Engrg Fundamentals	3
ECE 514	Digital Commctn Principles	3
ECE 515	Modern Digital Communications	3
ECE 516	Coding Distributed Storage Sys	3
ECE 519	Coding Reliable Communications	3
ECE 520	Info Theory and Applications	3
ECE 522	Electromagnetic Compatibility	3
ECE 565	Compt Vision Image Processing	3
ECE 566	Statistical Pattern Rcgntn	3
ECE 567	Statistical Signal Processing	3
ECE 568	Digital Speech Processing	3
ECE 569	Digital Signal Processing II	3
ECE 570	Fiber Optic Communication Syst	3

ECE 576	Antenna Theory	3
ECE 578	Microwave Theory	3

Computers and Microelectronics

Code	Title	Credit Hours
ECE 407	Intro Comp Ntwks with Lab	4
ECE 408	Intro to Computer Ntwks	3
ECE 425	Anlys Dsgn Intgrtd Circuits	3
ECE 429	Intro to VLSI Design	4
ECE 441	Microcomputers/Embedded Comp	4
ECE 443	Intro Computer Cyber Security	4
ECE 446	Advanced Logic Design	4
ECE 449	Obj-Orntd Cmptr Sim	3
ECE 485	Computer Organization & Design	3
ECE 502	Basic Network Theory	3
ECE 517	Wireless Ntwrk Protocols/Stand	3
ECE 518	Computer Cyber Security	3
ECE 521	Quantum Electronics	3
ECE 523	Fund of Semiconductor Devices	3
ECE 524	Adv Electronic Circuit Design	3
ECE 525	RF Integrated Circuit Design	3
ECE 526	Active Filter Design	3
ECE 527	Perform Anlys RF Intgrtd Crcts	3
ECE 528	Application Software Design	3
ECE 529	Advncd VLSI Systems Dsgn	3
ECE 530	High Performnc VLSI/IC Systems	3
ECE 541	Perform Eval Compt Ntwrk	3
ECE 542	Dsgn Optmztn Compt Ntwrks	3
ECE 543	Computer Network Security	3
ECE 544	Wireless and Mobile Networks	3
ECE 545	Advanced Computer Networks	3
ECE 546	Wireless Network Security	3
ECE 547	Wireless Ntwrks Perf Analysis	3
ECE 571	Nanodevices Technology	3
ECE 575	Electron Devices	3
ECE 583	High Speed Compt Arithmetic	3
ECE 584	VLSI Archs Sgnl Prcs Commnctns	3
ECE 585	Advanced Compt Arch	3
ECE 586	Fault Detcntn Digital Circuits	3
ECE 587	Hardware Software Codesign	3
ECE 588	CAD Techniques VLSI Dsgn	3
ECE 589	CAD of Analog IC	3

Power and Control

Code	Title	Credit Hours
ECE 411	Power Electronics	4
ECE 417	Power Dist Engring	3
ECE 418	Power Systems Analysis	3
ECE 419	Power Systems Analysis w/Lab	4
ECE 420	Analyt. Methods for Power Syst	3
ECE 438	Control Systems	3
ECE 505	Applied Optimization Engrgs	3
ECE 506	Anlys Nonlinear Systems	3

ECE 512	Hybrid Electric Vehicle Drives	3
ECE 531	Linear System Theory	3
ECE 533	Robust Control	3
ECE 535	Discrete Time Systems	3
ECE 538	Renewable Energies	3
ECE 539	Compt Aided Dsgn Elec Machines	3
ECE 540	Relibilty Theory Syst Implntn	3
ECE 548	Energy Harvesting	3
ECE 549	Motion Control Syst Dynamics	3
ECE 550	Power Elect Dymnms Control	3
ECE 551	Advanced Power Electronics	3
ECE 552	Adjustable Speed Drives	3
ECE 553	Power System Planning	3
ECE 554	Power Systems Relaying	3
ECE 555	Power Market Operations	3
ECE 556	Power Mkt Ecnmcs Security	3
ECE 557	Fault Tolerant Power Systems	3
ECE 558	Power System Reliability	3
ECE 559	High Voltage Power Trans	3
ECE 560	Power Syst Dynamics Stability	3
ECE 561	Deregulated Power Systems	3
ECE 562	Power Syst Tran Management	3
ECE 563	Comptl Intlgn Engineering	3
ECE 564	Cntrl Oprtn Elect Power Sys	3
ECE 579	Oper/Plan/Dist Power Grid	3
ECE 580	Elements of Sustainable Energy	3
ECE 581	Elements of Smart Grid	3
ECE 582	Microgrid Design and Operation	3