

Electrical Engineering

College of Engineering

The Department of Electrical and Computer Engineering offers advanced studies leading to either a Master of Science in Electrical Engineering or a Doctor of Philosophy in Electrical Engineering.

Admission Requirements

A minimum grade point average of 3.0/4.0 on all undergraduate work is required for admission to the graduate program. A minimum GRE general test scores of 301 (combination of Verbal and Quantitative sections) and analytical writing of at least 2.5 for the M.S. degree. The corresponding minimum GRE scores for Ph.D degree are 310 (V+Q) and 3.0 (Writing). Meeting the minimum requirements does not guarantee admission will be granted. Acceptance is based upon a competitive evaluation and on a space-availability basis. An undergraduate degree in electrical engineering is preferred. Those applicants without a B.S.E.E. degree from an ABET accredited EE program should develop competence and demonstrate ability in the fundamentals of electrical engineering. Such students, before being admitted to full graduate standing within the department, must take (or have taken an equivalent of) a set of prescribed electrical engineering remedial courses. A minimum grade of C must be made in these courses.

Degree Requirements

For the M.S.E.E. degree, both the thesis and non-thesis options are available. The thesis option requires 24 hours of acceptable graduate level work plus the satisfying of the usual requirements for the thesis. The non-thesis option, Plan B, requires 30 hours of acceptable graduate work plus an additional three hours of EE 784 (Research Project in Electrical Engineering). All students in their first semester of regular graduate work must select an academic advisor who will assist the student in formulating a graduate plan of study leading to their particular degree. This plan, which must receive the approval of the Director of Graduate Studies, must contain specific courses and a proposed thesis area or specialized project topic.

For the PhD degree, students who only have a B.S. degree must complete 42 hours of course work. Students who have a M.S. degree from an accredited institution must complete 18 hours of course work. Students who have a M.S. degree from a non accredited institution must complete 24 hours of course work.

In order to assure a minimum breadth and level of understanding at the graduate level, all EE graduate students must take three of six specified courses from the major areas of electrical engineering. These courses are: EE 611 Deterministic Systems, EE 621 Electromagnetic Systems, EE 640 Stochastic Systems, EE641 Advanced Power Systems, EE 661 Solid State Electronics, EE 685 Digital Computer Structure. PhD students must also take a course in technical writing such as WRD 204.

The Department of Electrical and Computer Engineering has active research programs in the following areas: power electronics, power systems, electromechanics, computer engineering, control systems, electromagnetics, electro-optics, micro and nano-electronics, signal processing, communication systems, and controls. Departmental laboratories are well-equipped for students' research. In addition, the Power and Energy Institute of Kentucky provides additional research opportunities.

Graduate Courses

EE 402G	Electronic Instrumentation And Measurements (Same As Phy 402G)	(3)
EE 415G	Electromechanics	(3)
EE 416G	Energy Conversion Laboratory	(2)

EE 421G	Signals And Systems I	(3)
EW 422G	Signals And Systems II	(3)
EE 461G	Introduction To Electronics	(3)
EE 462G	Electronic Circuits Laboratory	(2)
EE 468G	Introduction To Engineering Electromagnetics	(4)
EE 511	Introduction To Communication Systems	(3)
EE 512	Digital Communication Systems	(3)
EE 517	Advanced Electromechanics	(3)
EE 518	Electric Drives	(3)
EE 521	Introduction To Wireless Communications	(3)
EE 522	Antenna Design	(3)
EE 523	Microwave Circuit Design	(3)
EE 524	Solid State Physics (Same As PHY 524)	(3)
EE 525	Numerical Methods And Electromagnetics	(3)
EE 527	Electromagnetic Compatibility	(3)
EE 530	Robotics	(3)
EE 531	Alternative And Renewable Energy Systems	(3)
EE 332	Smart Grid-Automation And Control Of Power Systems	(3)
EE 533	Advanced Power System Protection	(3)
EE 536	Power System Fault Analysis And Protection	(3)
EE 537	Electric Power Systems I	(3)
EE 538	Electric Power Systems Ii	(3)
EE 539	Power Distribution Systems	(3)
EE 543	Solar Cell Devices And Systems For Electrical Energy Generation	(3)
EE 560	Semiconductor Device Design	(3)
EE 561	Electric And Magnetic Properties Of Materials (Same As MSE 561)	(3)
EE 562	Analog Electronic Circuits	(3)
EE 564	Digital Electronic Circuits	(3)
EE 567	Introduction To Lasers And Masers (Same As PHY 567)	(3)
EE 569	Electronic Packaging Systems And Manufacturing Processes (Same As MSE 569)	(3)
EE 571	Feedback Control Design	(3)
EE 572	Digital Control Of Dynamic Systems	(3)
EE 576	Cybersecurity	(3)
EE 579	Neural Engineering: Merging Engineering With Neuroscience (Same As BME 579)	(3)
EE 580	Embedded Systems Design	(3)
EE 581	Advanced Logical Design	(3)
EE 582	Hardware Description Languages And Programmable Logic	(3)
EE 584	Introduction To Vlsi Design And Testing	(3)
EE 585	Fault Tolerant Computing	(3)
EE 586	Communication And Switching Networks	(3)
EE 587	Microcomputer Systems Design (Same As CS 587)	(3)
EE 588	Real-Time Digital Systems	(3)
EE 589	Advanced VLSI	(3)
EE 595	Independent Problems	(1-3)
EE 599	Topics In Electrical Engineering (Subtitle Required)	(2-3)
EE 601	Electromagnetic Energy Conversion I	(3)
EE 603	Power Electronics	(3)
EE 604	Switch Mode Converters	(3)

EE 605	Systems For Factory Information And Control (Same As MFS 605)	(3)
EE 606	Seminar And Project In Manufacturing Systems Engineering (Same As MFS/ME 606)	(3)
EE 611	Deterministic Systems	(3)
EE 613	Optimal Control Theory	(3)
EE 614	Adaptive Control	(3)
EE 621	Electromagnetic Fields	(3)
EE 622	Advanced Electrodynamics	(3)
EE 624	Computational Electromagnetics: The Finite-Difference	(3)
EE 625	Advanced Computational Electromagnetics	(3)
EE 630	Digital Signal Processing	(3)
EE 635	Image Processing (Same As CS 635)	(3)
EE 639	Advanced Topics In Signal Processing And Communications	(3)
EE 640	Stochastic Systems	(3)
EE 641	Advanced Power Systems	(3)
EE 642	Discrete Event Systems (Same As CS 642)	(3)
EE 661	Solid-State Electronics	(3)
EE 663	Optoelectronic Devices	(3)
EE 664	Multidisciplinary Sensors Laboratory	(3)
EE 684	Introduction To Computer Aided Design Of Vlsi Circuits	(3)
EE 685	Digital Computer Structure	(3)
EE 686	Advanced Computer Architecture Design	(3)
EE 699	Topics In Electrical Engineering (Subtitle Required)	(3)
EE 748	Master's Thesis Research	(0)
EE 749	Dissertation Research	(0)
EE 767	Dissertation Residency Credit	(2)
EE 768	Residence Credit For The Master's Degree	(1-6)
EE 769	Residence Credit For The Doctor's Degree	(0-12)
EE 780	Advanced Practice In Electrical And Computer Engineering	(1-3)
EE 783	Special Problems In Electrical Engineering	(1-3)
EE 784	Research Project In Electrical Engineering	(3)
EE 790	Research In Electrical Engineering	(1-9)
EGR 537	Numerical Analysis (Same As CS/MA 537)	(3)
EGR 599	Topics In Engineering (Subtitle Required)	(1-3)
EGR 611	Boundary Element Methods In Engineering (Same As ME 611)	(3)
EGR 621	Finite Element Analysis In Engineering	(3)