ELECTRICAL ENGINEERING

Two post-graduate degree programs are offered by the Electrical and Computer Engineering Department at Rose-Hulman Institute of Technology: the Master of Science in Electrical Engineering (MSEE) degree, that requires a thesis and a publication, and the Master of Electrical and Computer Engineering (MECE) degree that does not require a thesis or a publication, but instead requires 12 credit hours of additional course work.

Both degree programs combine mathematics, physics, engineering, and computer science to meet the demands of the highly volatile field of electrical and computer engineering. A student's plan of study for the MSEE degree is arranged by the student, the student's advisory committee chairperson, and the student's advisory committee. The MSEE student's advisory committee must consist of at least

1. an RHIT ECE faculty member serving as the major advisor who guides the student's thesis research,
2. a second RHIT ECE faculty member, and
3. an RHIT faculty member from outside of the ECE department.

Similarly, an MECE student's plan of study is arranged on an individual basis through a joint agreement between the student and his or her academic advisor, who must be a member of the RHIT ECE faculty.

Both degree programs seek to build upon the basic foundations established by the student's undergraduate course of study. The student's plan of study may reflect a desire to concentrate on a specialized interest or a desire for a better understanding of the broad underlying theories of the entire profession.

Special areas of interest within the Electrical and Computer Engineering Department include Communications, Computer Architecture and Microcomputers, Control Systems and Robotics, Electromagnetics, Electronics, MEMS, Power Systems, and Signal and Image Processing. The objective of both programs, the Master of Electrical and Computer Engineering and Master of Science in Electrical Engineering, is to prepare graduates for early career advancement in the field of Electrical and Computer Engineering by building upon their undergraduate training with advanced coursework and concentrated study of problems and topics relevant to the field.

Graduates of the MECE and MSEE programs will have the ability to...

1. develop behavioral models of electrical/computing systems or devices using theory, measurement, simulation, or physical understanding;
2. analyze and design systems by synthesizing or extending foundational knowledge as appropriate;
3. solve open-ended/ill-defined problems by identifying requirements, learning independently, and evaluating the quality and feasibility of solutions.
4. compile and describe previous work related to the thesis topic
5. demonstrate to the engineering community how their original work contributes to the field through written and verbal communication.

Requirements

Master of Science in Electrical Engineering (MSEE) Requirements

- 48 credit hours, 36 credit hours of course work as approved by the student's advisory committee.
- At least 24 credit hours must be upper-level ECE courses (ECE4xx or ECE5xx)
- No more than 12 credit hours of 400-level classes can count toward the MSEE degree.
- 12 credit hours of thesis work (the Institute's non-thesis option is not permitted for the MSEE degree).
- Successful defense of thesis.

Note: The BSEE or BSCPE degrees do not allow Area Elective credits to double-count towards the MSEE degree.

ECE Graduate Course Offerings

Code	Title	Hours
Communications		
ECE 412	Software Defined Radio	4
ECE 414	Wireless Systems	4
ECE 510	Error Correcting Codes	4
ECE 511	Data Communications	4
ECE 512	Probability, Random Processes, and Estimation	4
Computer Architecture and Microcomputers		
ECE 433	Advanced Digital System Design with Verilog	4
ECE 434	Embedded Linux	4
ECE 530	Advanced Microcomputers	4
ECE 534	Advanced Signal & Power Integrity	4
ECE 531	Digital Test & Product Engineering	4
ECE 532	Advanced Topics in Computer Architecture	4
ECE 497	Special Topics in Electrical Engineering	1-10
ECE 597	Special Topics in Electrical Engineering	1-6
Control Systems and Robotics		
ECE 420	Discrete-Time Control Systems	4
ECE 425	Introduction to Mobile Robotics	4
Electromagnetics		
ECE 540	Antenna Engineering	4
ECE 541	Microwave/Millimeter-Wave Engineering	4
ECE 542	Advanced Eletromagnetics	4
ECE 597	Special Topics in Electrical Engineering	1-6
Electronics and MEMS		
ECE 452	Power Electronics	4
ECE 454	System Level Analog Electronics	4
ECE 516	Introduction to MEMS: Fabrication & Applications	4
ECE 551	Digital Integrated Circuit Design	4
ECE 552	Analog Integrated Circuit Design	4
ECE 553	Radio-Frequency Integrated Circuit Design	4
ECE 556	Power Electronics: DC Power Supplies	4
ECE 557	Analog Test & Product Engineering	4
ECE 558	Mixed-Signal Test & Product Engineering	4
Power Systems		
ECE 452	Power Electronics	4
ECE 470	Power Systems Analysis I	4
ECE 471	Power Systems Analysis II	4
ECE 472	Power Systems II	4
ECE 473	Control of Power Systems	4

Signal and Image Processing		
ECE 480	Introduction to Image Processing	4
ECE 481	Electronic Music Synthesis	4
ECE 483	DSP System Design	4
ECE 580	Digital Signal Processing	4
ECE 582	Advanced Image Processing	4
ECE 584	Medical Imaging Systems	4