

# Electrical Engineering

Electrical Engineers are involved in channeling natural resources into uses for man such as heating, lighting, home appliances, transportation, and communication. They are primarily concerned with the processes of generation, transmission, transformation, control, and utilization of energy or information

Missouri S&T's ABET-accredited program combines basic science and engineering principles with a strong emphasis in design and a solid technical knowledge. The curriculum is flexible enough for you to satisfy technical elective requirements with coursework in and/or outside the Electrical and Computer Engineering Department, allowing you to take courses in Computer Engineering, Computer Science, Mathematics, Mechanical Engineering, Physics or Bioinformatics.

In the Electrical Engineering program at Missouri S&T, you can choose to emphasize an area which especially interests you or you can study a broader spectrum of course work.

- Circuits: the application of basic electrical elements – energy sources, resistors, inductors, capacitors, diodes, and transistors - as they are found interconnected in operational electrical networks.
- Communications-signal processing: the makeup of information-bearing signals, modulation systems, and detection techniques.
- Computer engineering: the design and/or applications of microprocessor systems, digital logic, digital-logic devices, digital design and automation, large computer systems, robot vision systems, artificial intelligence, and distributed processing.
- Controls: design and application of circuits and systems used to automatically monitor and regulate devices, machines, and systems for optimal performance in a variety of operations including flexible manufacturing.
- Electromagnetics: high-frequency waves, antennas, and microwave systems of various types for propagation and transmission of electrical signals through space or conductors.
- Optics and devices: light propagation, optical processing, fiber optics, optoelectronics, and solid-state devices which have application to telecommunications, computing, microscopy, lasers, sensing, and smart structures.
- Power: the design and application of motors, generators, transformers, distribution systems, high-voltage design methods, and the economic transmission of energy.

## Departmental Contact Information:

573-341-4506                      141 Emerson Electric Hall  
ece.mst.edu                      ece@mst.edu  
Department Chair:              Dr. Kelvin Erikson

## Student Organizations and Undergraduate Research

Undergraduate research opportunities are available through the Opportunities for Undergraduate Research Program as well as many faculty-sponsored projects. The computer engineering, electrical engineering and computer science departments collaborate on many projects and research centers.

Many current research projects involve faculty members from multiple disciplines. This provides undergraduates with interdisciplinary interests an excellent opportunity to do research in these areas while working on a degree in computer engineering.

## Top Hiring Employers

Intel	Micron Technology
US Air Force	Hewlett Packard
Caterpillar	Motorola
Adtran	Sun
NCR	Guidant
Boeing	Tellabs

## Facilities and Technology

- Applied Computational Intelligence Laboratory
- Applied Microwave Nondestructive Testing Laboratory
- Ameren Power Electronics Laboratory
- Intelligent Microsystem Laboratory
- Electromagnetic Compatibility Laboratory
- Trustworthy Systems Laboratory
- The Real Time Power and Intelligent Systems (RTPIS) Laboratory

## Scholarship Information

Freshman scholarships are automatically awarded based on high school transcripts and ACT/SAT scores. No separate application is necessary. Scholarships ranging from \$500 to \$2,000 for sophomores, juniors and seniors typically require an application and are based on academic record, service activities and extracurricular activities.

## Co-op and Internship Availability

Co-op and summer intern programs are available to students. These programs provide students with the opportunity to integrate their classroom studies with learning through productive work experiences in a field related to a student's academic or career goals. Work for a semester or a summer to build your resume.

## Faculty

### Professors:

Daryl Beetner, D.Sc., Washington University in St. Louis  
 Minsu Choi, Ph.D., Oklahoma State  
 Badrul Chowdhury, Ph.D., Virginia Tech  
 Keith Corzine, Ph.D., Missouri S&T  
 Mariesa Crow, Ph.D., Illinois  
 James Drewniak, (Curator's), Ph.D., Illinois  
 Richard E. DuBroff, Ph.D., Illinois  
 Kelvin T. Erickson, Ph.D., Iowa State (Chair)  
 Randy Moss, Ph.D., Illinois  
 David Pommerenke, Ph.D., Technical University at Berlin  
 Jagannathan Sarangapani, Ph.D., Texas-Arlington  
 Steve E. Watkins, Ph.D., Texas (Assoc. Chair)  
 Cheng-Hsiao Wu, Ph.D., Rochester  
 Donald C. Wunsch II, Ph.D., Washington  
 Chengshan Xiao, Ph.D., University of Sydney, Australia  
 Reza Zoughi, Ph.D., Kansas

### Associate Professors:

Levant Acar, Ph.D., Ohio State  
 Norman Cox, Ph.D., Texas-Arlington  
 Mehdi Ferdowsi, Ph.D., Illinois Institute of Technology  
 Steven Grant, Ph.D., Rutgers  
 Marina Koledinsteva, Ph.D., Moscow Technical University  
 Chang-Soo Kim, Ph.D., Kyungpook National University  
 Kurt Kosbar, Ph.D., Southern California  
 Ronald Joe Stanley, Ph.D., Missouri-Columbia  
 Hai Xiao, Ph.D., Virginia Tech  
 Sahra Sedighsarvestani, Ph.D., Purdue  
 Yahong Rosa Zheng, Ph.D., Carleton University, Canada

### Assistant Professors:

Jun Fan, Ph.D., Missouri S&T  
 Jonathan Kimball, Ph.D., Illinois  
 Yiyu Shi, Ph.D., UCLA  
 Maciej Zawodniok, Ph.D., Missouri S&T

### Associate Teaching Professor:

Bijaya Shrestha, Ph.D., Missouri S&T

### Assistant Teaching Professors:

Rohit Dua, Ph.D., Missouri S&T  
 John E Seiffert IV, Ph.D., Missouri S&T  
 Theresa M. Swift, Ph.D., Missouri S&T

<sup>1</sup>Registered Professional Engineer

## Related Programs and Minors

In addition to a Bachelor of Science in Electrical Engineering, Missouri S&T offers the following related degree programs. Requirements are outlined in Missouri S&T's course catalog, available online at [registrar.mst.edu](http://registrar.mst.edu).

- Bachelor of Science, Computer Engineering
- Bachelor of Science, Computer Science
- Minor, Computer Science
- Minor, Bioinformatics

## Notes

Detailed information on course equivalencies, acceptable credits for elective coursework, grade requirements and prerequisites is available from S&T's Registrar's Office at [registrar.mst.edu](http://registrar.mst.edu).

All Electrical Engineering students must take the Fundamentals of Engineering Examination prior to graduation. A passing grade is not required; however, this is the first step to becoming a registered professional engineer.

## Bachelor of Science

Electrical Engineering..... 128 credit hours

Entering freshmen desiring to study Electrical Engineering are admitted to the Freshman Engineering Program. They may, however, state an Electrical Engineering preference, which will be used as a consideration for available freshman departmental scholarships. The focus of the Freshmen Engineering program is on enhanced advising and career counseling, with the goal of providing to the student the information necessary to make an informed decision.

### FIRST YEAR

	Credit
FE 1100-Careers in Engineering.....	1
MechE 1720-Engineering Design .....	3
Chemistry 1310, 1319-General Chemistry .....	5
English 1120-Exposition.....	3
Math 1214-Calculus for Engineers I.....	4
Math 1215-Calculus for Engineers II.....	4
Physics 1135-Engineering Physics I.....	4
History 1200, 1300, 1310 -or- Pol Sci 1200.....	3
Economics 1100 or 1200-Micro or Macroeconomics .....	3
Elective/Humanities .....	3
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### SECOND YEAR

CompSci 1570, 1580-Computer Programming w/ Lab .....	4
CompE 2210-Intro to Computer Engineering .....	3
CompE 2211-Computer Engineering Lab I.....	1
ElecE 2200, 2201-Intro to Electronic Devices w/ Lab.....	4
ElecE 2100, 2101-Circuits I w/ Lab.....	4
ElecE 2120-Circuits II .....	3
Physics 2135-Engineering Physics II .....	4
Math 3304- Differential Equations .....	3
Math 2222-Calculus III w/ Analytic Geometry.....	4
Elective/Engineering Science .....	3
	33

### THIRD YEAR

ElecE 3100, 3101-Electronics I w/ Lab.....	4
ElecE 3410, 3411-Linear Systems I w/ Lab.....	4
ElecE 3400, 3401-Continuous Linear Systems w/ Lab.....	4
ElecE 3600-Electromagnetics w/ Lab.....	4
ElecE Elective .....	3
English 3560-Technical Writing.....	3
Math 3108-Linear Algebra.....	3
Sp&M 1185-Speech .....	3
Stat 3117-Probability & Statistics for Engineers.....	3
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### FOURTH YEAR

ElecE 4096-Senior Project I.....	1
ElecE 4097-Senior Project II.....	3
ElecE Power Elective w/ Lab .....	4
ElecE Elective .....	3
ElecE Elective.....	3
ElecE Elective .....	3
ElecE Elective.....	3
Elective/Free.....	3
Elective/Free.....	2
Elective/Humanities or Social Science.....	3
Elective/Humanities or Social Science.....	3
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