TECHNICAL EE TRACK DESCRIPTIONS

ENERGY, POWER, AND SUSTAINABILITY

TRACK DESCRIPTION:

The Energy, Power and Sustainability track prepares students for professions related to electricity energy generation and conversion, electricity transmission and distribution, as well as electric power grid operation. The potential job markets include electricity utility industry, power electronics industry, automobile industry, etc. The key technologies related to energy conversion, renewable energy integration, and power system operation are covered in the track courses Electromechanical Systems, Power Electronics, Energy Delivery Systems, Power System Analysis, Power Systems II, Power System Protection, etc.

TRACK FACULTY:

- L. Fan
- R. Fehr
- Z. Miao
- E. Stefanakos

COMMUNICATION SYSTEMS

TRACK DESCRIPTION:

In today's complex, interconnected world, the effective creation, distribution, and use of information via technology is central to daily life. Communication systems facilitate, enable and often define the relationships between corporations and consumers, buyers and suppliers, businesses of all sizes, social networks, and citizens and their governments. The importance of communication systems to organizations and the need for well-educated professionals in the field is the basis for the EE Track in Communication Systems. Whether designing or implementing complex space, terrestrial or undersea communication systems, our graduates will fill an essential need across all sectors of society. Students graduating from the Communication Track will have the opportunity to work in any communication and signal processing company including Verizon, AT&T, Sprint, Motorola, Ericsson, Huawei, Apple, Intel, Google, Microsoft, Texas Instrument, Analog Devices, Samsung, etc.

TRACK FACULTY:

- H. Arslan
- N. Ghani
- R. Gitlin
- V. Jain
- S. Morgera
- R. Sankar
- I. Uysal
- Y. Yasin
- K.C. Zhuo

MICRO AND NANO SCALE SYSTEMS

TRACK DESCRIPTION:

Throughout history products derived from the field Electrical Engineering have lead the way into the future. Computers, large screen TV's, cell phones, robotics and drones are just a few examples of high level systems whose engine is Electrical Engineering based. And, the foundation upon which all of this is built is electronic materials. Guided by the evolution of Quantum Mechanics and the Band Theory of Solids Engineers and Scientists continue to advance understanding of atoms and electrons and how they determine the properties of materials and devices. Recently discovered nano-materials have opened a new frontier in the capabilities of electronic materials and are enabling the next generation of these systems.

TRACK FACULTY:

- C. Ferekides
- A. Hoff
- D. Morel
- R. Saddow
- R. Schlaf
- A. Takshi
- S. W. Thomas
- P. H. Wiley

BIOELECTRICAL SYSTEMS

TRACK DESCRIPTION:

Electrical engineers have played a major role in the advances made in biomedicine ranging from medical imaging to nano-biotechnology, from electrocardiography to electroencephalography to radiation therapy, and from DNA chip fabrication to DNA image analysis, and so on. Courses offered include Biomedical Image Processing, Biomedical Systems and Pattern Recognition, Bioelectricity, Bioelectronics, System on a Chip (which includes DNA chips), Medical Histology (offered by CoM), Integrated Circuit Technology, and many more. Also on the slate are Biomolecular Systems and Biosensors and Systems. Some of these courses are offered at dual levels, i.e., both at the UG&G levels. Research opportunities also exist.

TRACK FACULTY:

- A. Hoff
- V. Jain
- A. Parthasarathy
- S. Saddow

WIRELESS CIRCUITS AND SYSTEMS

TRACK DESCRIPTION:
Wireless Circuits and Systems track focuses on radio frequency devices and systems that are the backbone of wireless communications and enable diverse applications that include automotive radar, the Internet of Things and magnetic resonance imaging. In this track, students gain experience using industry-standard computer aided engineering tools for device and system design. In addition, students gain experience on state-of-the-art microwave instrumentation tools for device and system characterizations. The courses in this track provide many opportunities for students to design, fabricate and test their own designs for components such as antennas, filters and amplifiers using technologies from printed circuits to integrated circuits. Students graduating from the track will have opportunity to pursue their professional careers in research institutions and companies focused on design/fabrication/testing of commercial/military wireless communication hardware

TRACK FACULTY:

- J. Wang
- L. Dunleavy
- G. Mumcu
- T. Weller

MECHATRONICS, ROBOTICS AND EMBEDDED SYSTEMS

TRACK DESCRIPTION:
The Mechatronics, Robotics and Embedded Systems (MRES) track has been designed to offer electrical engineering students the opportunity to acquire and develop the necessary fundamental knowledge and the skill set complemented with experiential learning activities in order to play major roles in the design, development, integration and test of technology solutions with societal impact in areas such as Industrial Automation & Control, Energy Generation & Management, Robotics, Biomedical, Smart Cities, Cyber-physical Systems, Internet of Everything (IoE), Autonomous Vehicles, Agriculture and Consumer's Electronics among others . The MRES track designed curriculum includes courses in Mechatronics, Control Systems, Embedded Systems and tailored technical electives to effectively participate and contribute in cross disciplinary employment opportunities as an Electrical Engineer.

TRACK FACULTY:

- S. Bhanja
- R. Bishop
- A. Castellanos
- M. Chang
- C. Jeong
- S. Kose
- W. Moreno