EE Concentration: Microsystems and Nanotechnology

Requirements: Complete ESE336
Choose 3 Electives: ESE 330, ESE 510, ESE 521, ESE 525, ESE 529, ESE 621

Requirement Flow:

Impact: Underpinning computers, smartphones, IoT nodes, and the navigation units of autonomous vehicles are the transistors, memory elements, sensors, displays, and wireless interfaces upon which these electronic systems are constructed. Microsystems and nanotechnology devices bridge between the digital and physical worlds, routing the electronic charges that perform computation, converting sensory inputs from the physical world (e.g. sound, movement) into electronic signals, and translating between voltages & currents and the specific electromagnetic waves that wirelessly carry information to and from our smartphones. Coming advances in computing, self-driving vehicles, wireless data rates (i.e. 5G), and the IoT are all critically dependent on innovations in microsystems and nanotechnologies.

Description: The EE concentration in Microsystems and Nanotechnology provides students with a fundamental knowledge of how transistor, semiconductor, photonic, and electromechanical devices operate and are fabricated. The elective courses allow students to specialize and gain a deeper understanding in specific areas such as electromagnetics and antennas, microelectromechanical systems (MEMS), deeply scaled CMOS, next generation transistor technologies, quantum principles and devices, and nanoscience.

Sample industries and companies:
- Semiconductor Devices and Fabrication: Intel, Global Foundries, Samsung, Applied Materials, Jazz, Micron
- RF and Wireless: Apple, Samsung, Broadcom, Qorvo, SKYWORKS, Intel, TDK
- Sensors: BOSCH, TI, TDK, Analog Devices, STMicroelectronics

Sample job titles:
- Electronics, Process, RF Hardware, MEMS/Sensor Device Engineer

Graduate research in: Semiconductor devices and fabrication, RF devices, electromagnetics and antennas, MEMS