

EE 3405: Electronic Materials

3 Credit Hours

Prerequisite: EE 2401

This course focuses on the study of important properties of materials (such as electronic properties, thermal properties, magnetic properties, dielectric properties, optical properties, crystallographic and electronic defects) which play important role in the device operation and are engineered for various electrical engineering applications. The course covers topics starting from the elementary materials science concepts and fundamental quantum mechanics to modern device applications including superconductors, supercapacitors, piezoelectricity, magnetic and optical data storage technologies, communication via optical fiber etc. Also the course includes various measurement techniques to probe electronic, crystallographic, and structural properties of materials including resistivity and Hall effect measurements, X-ray diffraction, electron microscopy, and atomic force microscopy. Device design and fabrication aspects are discussed in correlation with the material properties. The core knowledge obtained in this course are applicable to a wide range of areas within electrical engineering discipline, such as Photonics, Semiconductors & Microelectronics, Nano-scale electronics, Electric Machine Design & Electromagnetics etc.

EE 3501: Embedded Systems

4 Credit Hours

Prerequisite: CPE 2200 and Engineering Standing

This course will introduce the students to the fundamental concepts of interfacing a microcontroller platform with sensors, actuators, and stand-alone modules. In addition, we will study how embedded systems are designed for real-world applications. Specifically, the student will engage in project-based work utilizing graphical software to configure embedded system applications and apply robust software development skillsets for concurrent programming.