THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Power Electronics: Devices, Circuits, and Applications

ECE 5025

Credit Hours:
3.00

Course Levels:
Undergraduate (1000-5000 level)
Graduate (5000-8000 level)

Course Components:
Lecture

Course Description:
Provides an introduction to power electronic conversion principles. Analytical techniques will be developed through the study of widely used converter circuits.

Prerequisites and Co-requisites:
Prereq: 3020 (323), or Grad standing in Engineering, Biological Sciences, or Math and Physical Sciences.

Course Goals / Objectives:
- Provide an introduction to power electronics conversion principles
- Master analytical techniques through the study of an array of power electronics circuit topologies
- Be competent with typical circuit simulation tools
- Be exposed to contemporary energy related issues

Course Topics:

- Applications, fundamental rules
- Buck, boost converters
- Fly-back, fly-forward converters
- Power semiconductor devices
- Gate drive, busbar, and snubber circuits
- High power DC choppers
- Poly-phase rectifiers
- Switching matrix description of power converters
- Duality and generic power converters
- PWM converters
- Space vector modulation method
- Optimizing utility interface with power converters
- Power conditioners and uninterrupted power supplies

Designation:

Elective