

Department	Electrical and Computer Engineering
Course Number	EE 451
Course Title	Power Electronics
Course Designation	Elective
University Catalog Description	Semesters offered: S alternate years, to be offered even years; Prerequisites: EE 317, EE 321 and EE 355, Lec 2, Lab 1 -- Solid-state power devices; topologies, operating principles, and control methods of solid-state power converters; applications of solid-state power converters in different electric systems.
Faculty Coordinator	Dr. Hongwei Gao
Prerequisites by Topic	Electric Circuit laws and principles, calculus, differential equations, electric energy conversion devices, electronics.
Textbook	<i>Introduction to Power Electronics</i> , Daniel W. Hart, Prentice Hall 1997.
Course Objectives	To produce graduates who understand the characteristics and applications of basics power switches, and the fundamental principles of basic power electronic converters.
Course Learning Outcomes	At the conclusion of EE 451, students are expected to be able to: 1) Understand the switching characteristics of basic power switches 2) Understand the applications of power switches in basic power electronic converters 3) Understand the fundamental principles of basic power electronic converters 4) Know how to calculate the voltage, current, and the parameters of the basic power electronic converters 5) Know how to simulate the basic power electronic converter 6) Know how to design the basic power electronic converter
Topics Covered	1) Switching characteristics of basic power switches 2) Application of basic power switches in power electronics 3) Operation of basic power electronic converters 4) Design of basic power electronic converters
Class/Laboratory Schedule	EE 451 meets twice a week for 50 minutes and once per week for 110 minutes
Professional Component (Criterion 5)	This course develops analytical and design skills necessary for analysis and design of power electronic converters.
ECE Program Outcomes	EE 451 supports the following Program Outcomes: a. An ability to apply knowledge of mathematics, science and engineering b. An ability to design and conduct experiments, as well as to analyze and interpret data c. An ability to design a system, component, or process to meet desired needs k. An ability to use the techniques, skills and modern engineering tools necessary for engineering practice. r. An ability to analyze electrical and electronic systems.
Total Credit Hours	3
Prepared by	James Becker 5/27/09