King Fahd University of Petroleum and Minerals
Electrical Engineering Department

EE460: Power Electronics

Dr. Mahmoud Kassas
Second Semester 2007-2008 (071)

Course Information

Text Book:	Power Electronics: Circuits, Devices and Applications" 3rd edition, by Rashid, M. H.				
	Name, Email address	Office	Phone	Office Hours	Sections
Instructors:	Dr. Mahmoud Kassas *mkassas@kfupm.edu.sa*	59/1081	2271	S-W 12:10-13:00 M 13:00-14:00 or by appointment	1
Grading:	Attendance, Assignments and Quizzes	Projects	Two Majors		Final
	15% (2%, 3%, & %10)	5%	30%		30%
	First Major	Second Major	Projects Due Dates	Final	
Exams Dates:	**Sunday Oct. 28, 2007**	**Tues. Jan. 1, 2007**	**Monday Jan 14, 2007** At 4:00PM	**January 19, 2007** At 7:30AM	
Exams Times:	6:30-8:00 pm	6:30-8:00 pm			
Exams Places:					
Important Dates:	Last day to drop the course **without** a permanent record	Last day to drop the course with "**W**" grade	Last day to drop **all courses** with "W" Thru Registrar's office.		
	Sept. 18, 2007	**Nov. 6, 2006**	**Nov. 27, 2006**		
Field Trip	**To Be Arrange Later**				

Course Objectives:

After successfully completing the course, the students will be able to**:**

- Understand the theory and methods for analysis and design of power electronics circuits,

- Applications of solid-state devices for the control and conversion of electric energy.

- Know how to use design and simulation software such as Pspice and Matlab.

Outcome Coverage:

(a) *An ability to apply math, science and engineering knowledge.* The homework, project, quizzes and exams require direct applications of mathematical, scientific, and engineering knowledge to successfully complete the course.

(b) *An ability to design and conduct experiments, as well as to analyze and interpret data.* The homework and project require student to design, conduct simulations using Pspice or MATLAB and analyze simulation data.

(c) *An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.* The design in the project must be checked against real world operating limits.

(e) *Identify, formulate and solve engineering problems.* Students must be able to identify and model the system; analyze and solve control problems.

(g) *An ability to communicate effectively.* Students are required to write a comprehensive report on the project.

(k) *An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.* Students taking the course will learn how to use power electronics techniques and software tools such as Pspice and MATLAB for solving practical control problems.

Important Remarks:

- **Attendance:** 1/3 point will be deducted for each unexcused absence, starting from the first absence. Any student that exceeds 20% of the schedule class meeting without any official excuse will receive a grade **DN** in the course.

- **Official excuses:** All official excuses must be submitted to the instructor no later than one week of the date of the official excuse. The instructor may not accept a late excuse.

- **Academic Dishonesty:** According to the university regulations, if the instructor for any instance of academic dishonesty discovers any student, the instructor may give a failing (**F**) grade to the student and report it to the dean of the college.

- **Homework:** The homework assignment is to be solved completely by the students. However, homework solution will not be collected. Instead, quiz related to the homework problems is expected on Wednesdays, in the week following the homework assignment date. Homework solution can be found on the network link: **WebCT**

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KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

EE 460 – Power Electronics   **Tentative Schedule   [071]**

DATE	TOPICS	SECTIONS	HW	LABORATORY
Week 1 Sept. 08-13	Introduction to Power Electronics & Semiconductor Diodes	2.1, 2.3, 2.4, 2.5, 2.10	Ch. 2-1, 10, 12(b,c,d)	
Week 2 Sept. 15-19	Diode Circuit & Rectifiers	3.2, 3.3, 3.4,	Ch 3 1, 5, 7, 9,	**Lab 0:** PSpice and COM3LAB KIT Tutorial
Week 3 Sept. 22-26	Diode Circuit & Rectifiers	3.7, 3.10	Ch 3 11, 15, 21	
Week 4 Sept. 29 - Oct. 3	Thyristors	7.2, 7.3, 7.7, 7.5, 7.9,7.10	Ch 7 1, 3	**Lab 1:** Single phase half wave rectifier
Week 5 Oct. 20-25	Controlled Rectifiers	10.4	Ch10 1, 2, 7, 8,	**Lab 2:** Three-phase bridge rectifier, (Pspice)
Week 6 Oct. 27 – Oct. 31 **Major - I**	Controlled Rectifiers	10.9	Ch 10 22, 23	**Lab 3** Three-phase bridge rectifier. (Experiment)
Week 7 Nov. 3-7	AC Voltage Controllers	11.2, 11.4,	Ch 11 1, 3, 6,	**Lab 4**: Single-phase controlled bridge rectifier
Week 8 Nov. 10-14	AC Voltage Controllers	11.5, 11.12	Ch 11 8, 9, 28	**Lab 5**: Three-phase controlled bridge rectifier (PSpice)
Week 9 Nov. 17 – 21	Power Transistors	4.2, 4.3, 4.7	Ch 4 1, 2, 11	**Lab 6**: Three-phase controlled bridge rectifier (Experiment)
Week 10 Nov. 24-29	DC-DC Converters	4.7, 5.2,	Ch 4 2, 3,	
Week 11 Dec. 1 – 5	DC-DC Converters	5.3, 5.4	Ch 5 4, 6	**Lab 7**: Single-phase AC voltage controller (Pspice)
Week 12 Dec. 8 - 12	PWM Inverters	6.2, 6.3, 6.4	Ch 6 2, 3,	**Lab 8** Single-phase ac-voltage controller (Experiment)
Week 13 Dec. 29 – Jan. 2 **Major-II**	PWM Inverters	6.5, 6.6,	Ch 6 4,5,	**Lab 9**: Design of a DC chopper
Week 14 Jan. 5 – 9	PWM Inverters	6.8, 6.10, 6.11	Ch 6 6	**Lab 10**: Three-phase voltage source inverter
Week 15 Jan. 12 – 16	Resonant Pulse Inverters	8.2.1, 8.2.2	Ch 8 1, 3	**Lab Final**