Course Syllabus

Course ID	**0902512**
Course Title	**Power Electronics**
Prerequisite	**0902304**
Time & Date	
Coordinator	
Instructor	**Assoc. Prof. Dr.** Head of Communication and electronics Department
Office hours	
Course Description	Steady-state characteristics of SCR devices. Triggering techniques, SCR commutation methods,. Rectifying circuits with different loads. AC voltage controllers. DC-to-DC controllers. Cycle converters applications. Triac devices and applications.
Course Objectives	
Course Outcomes	After successfully completing this course, the students should be able to: (a) An ability to apply knowledge of and (b) An ability to design and conduct experiments, to analyze and interpret data (c) An ability to design a system, component, or process to meet desired needs (d) An ability to function on multi-disciplinary teams program outcomes (e) An ability to identify, formulate, and solve engineering problems (f) An understanding of professional and ethical responsibility (g) An ability to communicate effectively (h) The broad education necessary to understand the impact of engineering solutions in a global and societal context (i) A recognition of the need for, and an ability to engage in life-long learning (j) A knowledge of contemporary issues (k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Topics	1 Power semiconductors; Types and applications of power electronic 1 converters 2-6 AC-DC converters: Single-phase half-wave rectifiers (uncontrolled, 3, 4 controlled); Single phase and bi-phase full-wave Rectifiers: Uncontrolled, fully controlled, half-controlled; Three-phase bridge rectifiers: Uncontrolled, fully controlled; Applications 7-8 Effect of source inductance on rectifier circuits: Single phase, three- 3 phase; Input-side power factor; Inversion limits; Regulation 9-11 DC-AC converters: Single-phase inverters: (Single-leg, H-bridge); 8 PWM inverter; Three-phase inverter; Applications 12 AC-AC converters: Single-phase cycloconverter, single-phase transformer tap changer 5 13-15 DC-DC converters: Step-down, step-up, step-down/up; Applications; Ch6+handouts Switching loss in power semiconductor devices; Protection of power semiconductor devices using snubber circuits
Course Text Book	1) Lander, C. (1993). Power Electronics, Third Edition, McGraw Hill Co. 2) Rashid, M. H. (2003). Power Electronics: Circuits, devices, and Applications, Third Edition, Prentice-Hall Inc. 3) Mohan, N., Undeland, T. M., Robbins, W. (2003). Power Electronics, Converters, Applications, and Design, Third Edition, John Wiley. 4) Batarseh, I. (2003). Power Electronics Circuits, First Edition, John Wiley
Course References	
Course delivery	Lectures Tutorial Lab Homework Project Computer Internet Industrial Visit
Course Assessment	Assignments & short reports…….. 10% 2 exams @ 20% each ……. 40% Final exam …….. 50%
Updated	Dr. Saad 27/9/2009

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											
CO7											
CO8											

CO9											

	a	b	C	D	e	f	g	h	i	j	K
CO1											
CO2											
CO3											
CO4											
CO5											
CO6											
CO7											
CO8											
CO9											

ABET a-k Engineering and Technology program outcome

(a) An ability to apply knowledge of mathematics, science, and engineering
(b) An ability to design and conduct experiments, to analyze and interpret data
(c) An ability to design a system, component, or process to meet desired needs
(d) An ability to function on multi-disciplinary teams
(e) An ability to identify, formulate, and solve engineering problems
(f) An understanding of professional and ethical responsibility
(g) An ability to communicate effectively
(h) The broad education necessary to understand the impact of engineering solutions in a global and societal context
(i) A recognition of the need for, and an ability to engage in life-long learning
(j) A knowledge of contemporary issues
(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Plagiarism

Deliberate plagiarism is a serious act of academic misconduct. Students may be suspended from the University if they are found to have plagiarized their course work. Whether inadvertent or deliberate, plagiarism includes the following:

(a) word-for-word copying of sentences or whole paragraphs or presenting of substantial extracts from either paper-based or electronic sources the work or data of others that are published or unpublished (such as books, internal reports, and lecture notes or tapes) without clearly indicating their origin;
(b) using very close paraphrasing of sentences or whole paragraphs without due acknowledgement in the form of reference to the original work;
(c) submitting another student's work in whole or in part;
(d) using of another person's ideas, work or research data without acknowledgement;
(e) copying computer files, algorithms or computer code without clearly indicating their origin;
(f) submitting work that has been written by someone else on the student's behalf; and

submitting work that has been derived, in whole or in part, from another student's work by a process of mechanical transformation (e.g., changing variable names in computer programs