University of Tehran
School of Electrical and Computer Engineering

Course:	**8101083 – Power Electronics I**		
Course type:	Mandatory	EE*	Credit: 3
Level:	Graduate		
Co-requisite(s):			
Prerequisite(s):	Industrial Electronics		
Prerequisite by topic:			
Textbook(s):	1. John G. Kassakian, Martin F. Schlecht and George C. Verghese, "Principles of Power Electronics," Addison-Wesley, 1991. 2. Ned Mohan, Tore M. Undeland, William P. Robbins, "Power Electronics - Converters, Applications, and Design," Wiley, 2003. 3. Bimal K. Bose, "Modern Power Electronics and AC Drives," Prentice Hall, 2002. 4. P. Krein, "Elements of Power Electronics," Oxford University Press, 1998.		
Coordinator:	Shahrokh Farhangi		
Goals:	1. To provide basic knowledge of Power Electronics Devices and Systems. 2. To provide necessary bases for correct selection, analysis, design and optimization of power electronics devices and systems		
Outcome:	The students who successfully pass this course will be able to analyze, design and implement the power electronics systems.		

Topics:	• Part One: Power Electronics Components - Power MOSFET - Insulated Gate Bipolar Transistor IGBT - GTO - magnetic devices (inductors and transformers) • Part Two: Power Electronics Circuits or Systems - High Frequency Isolated DC / DC converters - Voltage Source Inverters VSI - Current Source Inverters CSI - Resonator Converters - AC / AC converters • Part Three: Control of Power Electronic Systems - Averaging theory and average model • Part Four: Auxiliary Circuits - Snubber circuits - Switch drivers - Current and voltage sensors - Controllers and PWM controllers • Part Five: Related topics - Electromagnetic compatibility (EMC) - Thermal Management
Computer usage:	PSpice, Matlab/Simulink
Assignments:	8 Assignments
Projects:	1 Final project
Grading:	Assignments: 8% Final project: 16% Midterm exam: 33% Final exam: 43%
Further readings:	Application notes, component data sheets, selected papers
Prepared by:	Shahrokh Farhangi
Date:	September, 2017

*EE: Electrical Engineering CE: Computer Engineering IT: Information Technology