



University of Tehran
School of Electrical and Computer Engineering

Course:	High Power Electric Converters -8101921		
Course type:	Main Course for Power Electronics and Electric Machines branch	EE*	Credit: 3
Level:	Graduate		
Co-requisite(s):	Power Electronics I		
Prerequisite(s):			
Prerequisite by topic:	Basic knowledge of industrial electronics		
Textbook(s):	[1] Bin WU, “ <i>High Power Converters and AC Drives</i> ”, Wiley-IEEE Press, 2006.		
Coordinator:	Hossein Imaneni		
Goals:	<p>Become familiar with the following topics:</p> <ol style="list-style-type: none"> 1. Technical challenges and considerations of medium voltage and high power electric systems 2. Different high power semiconductor switches and their series connection challenges 3. Different multilevel converter topologies and their modulation and control techniques 4. Different ac/ac converter topologies and their control techniques 5. Multi-pulse and active rectifiers topologies 6. Design of high power and medium voltage converters for power system and ac drive applications 		
Outcome:	<p>Students who pass the course successfully will be able to</p> <ol style="list-style-type: none"> 1. Performing series connection of high power devices and designing appropriate snubbers 2. Design of different multilevel converters’ control and modulation algorithms 3. Analysis and design of different ac/ac and ac/dc converters operating principles 4. Design of multilevel converter based on application 5. Design of multiples and active rectifiers 6. Analysis of EMI and different electromagnetic noise terms and designing appropriate EMI filters to remove them 		

Topics:	<ul style="list-style-type: none"> 1- Introduction to high power and medium voltage systems 2- High power semiconductor power switches 3- Multilevel converters and their control techniques 4- Multi-pulse and active rectifiers for high power applications 5- Electronic transformers 6- Applications of high power converters in industry 7- EMI and EMI filters
Computer usage:	Running simulations by Matlab/Simulink and PSCAD
Assignments:	Two assignments
Projects:	One final project
Grading:	Exercises and final project: 50% Midterm and Final exam: 50%
Further readings:	Selected papers
Prepared by:	Hossein Imaneni
Date:	November 1, 2017

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