



ESOGÜ Electrical-Electronics Engineering Department

COURSE CODE: 151227457-151247457 **COURSE TITLE:**Power System Analysis I

Semester	Weekly Hours		COURSE				
	Theoretical	Practical	Credits	ECTS	Type	Language	
7	3	0	3	5	Compulsory () Elective (x)	Turkish () English (x)	
Write the credit (for non-credit courses weekly hours) below (If necessary distribute the credits.).							
Math and Basic Science		Electrical Engineering [mark (√) if there is high design content]		General Education	Humanities		
		3 ()					
Assessment		THEORETICAL-PRACTICAL COURSES			LABORATORY COURSES		
		Type	Number	%	Activity Type	Number	%
Midterm		Midterm	1	45	Quiz		
		Quiz			Lab performance		
		Homework			Report		
		Project			Oral exam		
		Other (.....)			Other (.....)		
Final			1	55			
Makeup exam (Oral/Written)		Written					
Prerequisites		None					
Brief content of the course		Introduction to power system analysis, review of phasors, instantaneous power, complex power, and elementary aspects of balanced three-phase circuits, power transformers, transmission line parameters, steady state operation of transmission lines, symmetrical components.					
Objectives of the course		This course will help the students to understand the theory and the techniques involved in the modeling and analysis of power system components and networks. Moreover, they will learn how such modeling and analysis is used in the design and planning of power systems.					
Contribution of the course towards professional education		Students who learn the essential elements of electric power system and understand the specifications required for the design and planning of electrical power network can work in the projects related to the power system area. This course also provides strong background for graduate-level power system courses.					
Outcomes of the course		<ol style="list-style-type: none"> 1) Learn the analysis of balanced three-phase circuits. 2) Learn the modeling and analysis of power transformers. 3) Learn the transmission line parameters. 4) Learn the modeling and the analysis of the transmission lines. 5) Perform the transmissions line voltage regulation and the loadability analysis. 6) Apply the line compensation techniques. 7) Learn symmetrical component methods and analyze the unbalanced three-phase systems. 					
Textbook of the course		J. D. Glover, M. S. Sarma “Power System analysis and Design,” Brooks/Cole publishing, 5 th Edition, 2010.					
Other reference books							
Required material for the course							

WEEKLY PLAN OF THE COURSE

Week	Topics
1	Introduction to power system analysis
2	Phasors, instantaneous power in single and three-phase systems, complex power
3	Balanced three-phase circuits
4	Equivalent circuit of practical transformers and per-unit systems
5	Power transformers
6	Transmission line parameters
7	Medium and short transmission lines
8,9	Midterm
10	Transmission line differential equations and equivalent π circuit
11	Lossless lines and maximum power flow
12	Line loadability
13	Reactive compensation techniques
14	Symmetrical components
15,16	Final

NO	OUTCOMES OF THE PROGRAMME	4	3	2	1
1	Adequate knowledge of mathematics, science and Electrical and Electronic Engineering; ability to practice theoretical and practical knowledge of these areas into modeling and solving complex problems of Electrical and Electronic Engineering	X			
2	Ability to identify complex engineering problems in Electrical and Electronic Engineering and related fields, for this purpose having skills to formulate, select and apply appropriate methods.	X			
3	Having skills to apply modern design methods to design a complex system, process, equipment or product that should work under realistic conditions and constraints and satisfy specific requirements concerning the Electrical and Electronic Engineering.		X		
4	Having skills to develop, select and apply modern techniques and tools needed to analyze and solve complex applications in Electrical and Electronic Engineering, skills to use information technology effectively.				
5	Skills to design and conduct tests, collect data, analyze results, and interpret data for the experimental investigation of complex problems in Electrical and Electronic Engineering				
6	Ability to function effectively as an individual and as a member of teams within the discipline and in multidiscipline areas.				
7	Communicating effectively in oral and written form both in Turkish and English. Effective report writing and understanding written reports, preparing design and manufacturing reports, making effective presentations, skills to give and receive clear and concise instructions.				
8	Awareness of the necessity of lifelong learning, access to information, monitoring developments in science and technology and the ability to self-renewing				
9	Understanding of professional and ethical responsibility				
10	Information on project management, change management and risk management practices, awareness on entrepreneurship and innovation, knowledge on sustainable development.				
11	Information about universal and societal effects of engineering applications on health, safety and environment; awareness of the legal consequences of engineering solutions.				

Scale for assessing the contribution of the course to the program outcomes:

4: High 3: Medium 2: Low 1: None

Name of Instructor(s): Assoc. Prof. Bünyamin Tamyürek

Signature(s):

Date: 22.03.2016