GAU, Faculty of Engineering

Course Unit Title	Power Supply & Energy Transmission
Course Unit Code	EEN 484
Type of Course Unit	Technical Elective
Level of Course Unit	4th Year BSc
National Credits	3
Number of ECTS Credits Allocated	6 ECTS
Theoretical (hour/week)	3
Practice (hour/week)	-
Laboratory (hour/week)	-
Year of Study	4
Semester when the course unit is delivered	7
Name of Lecturer (s)	Prof. Dr. Adalet Abiyev
Name of Assistant (s)	-
Mode of Delivery	Face to Face, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	EEN303
Recommended Optional Programme Components	Assignments, E-learning(solution of examples)

Objectives of the Course:

- Tearch the techniques for calculating the active and reactive power
- Tearch of balanced and unbalanced three-phase circuits including polyharmonic conditions
- Teach the tree-phase powerful transformers analysis methods.
- Understand the energy mesurement and evaluation techniques in three-phase systems

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Teaching the generation of three-phase voltages.	1
2	Teaching the polyphase energy transmission and distribution systems.	1
3	Compute power and energy in unbalanced	1
4	Compute parameters of transformer from short-circuit and open-circuit	1
5	Conduct experiments and interpret obtained data	3

Assesment Methods: 1. Written Exam, 2. Assignment 3. Project/Report, 4.Presentation, 5 Lab. Work

Course's Contribution to Program

		CL
1	Ability to understand and apply knowledge of mathematics, science, and engineering	4
2	Ability to design and conduct experiments as well as to analyze and interpret data	5
3	Ability to work in multidisciplinary teams while exhibiting professional responsibility and ethical conduct	2
4	Ability to apply systems thinking in problem solving and system design	4
5	Knowledge of contemporary issues while continuing to engage in lifelong learning	2
6	Ability to use the techniques, skills and modern engineering tools necessary for engineering practice	3
7	Ability to express their ideas and findings, in written and oral form	4
8	Ability to design and integrate systems, components or processes to meet desired needs within realistic constraints	2
9	Ability to approach engineering problems and effects of their possible solutions within a well structured, ethically responsible and professional manner	3
11	Strong foundation on the fundamentals of Electrical and Electronics Engineering such as Circuit Theory, Signals, Systems, Control and Communications, which are necessary for successful practice in the field	5
12	Awareness on the contemporary requirements, methods and applications of the Electrical and Electronics Engineering	5

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate 4: High, 5:Very High)

Course Contents

1		Introduction	

2	Chapter 3	General structure and basic elements of an electric power system.	
3	Chapter 4	Balanced and unbalanced set of generated voltages.	
4	Chapter 5	Balanced Y-Y circuit analysis.	
5	Chapter 6	Balanced Y-Δ circuit analysis.	Quiz 1
6		Balanced Δ-Δ circuit analysis	
7	Chapter 10	Balanced Δ-Y circuit analysis	
8			Midterm
9		Electric power in a sinusoidal balanced system	
10	Chapter 11	Electric power in a nonsinusoidal balanced system.	
11	Chapter 12	Three-phase power and energy measurement algorithms in balanced and unbalanced power systems	Quiz 2
12	Chapter 7	Power transformers and their equivalent circuits.	
13		Effect of secondary current in and the reactances of the power transformers.	
14		Engineering aspects of transformer analysis. Short-circuit and open-circuit tests of transformers..	
15			Final Exam

Recommended Sources

Textbook: Allan R. Hamblay. Electrical Engineering. Principles and Applications. 2nd Edition,2002 by Prentice Hall İnc.

Supplementary Material (s):

1. James W. Nilsson, Susan A. Riedel. Electrical Circuits. 7th Edition. Prentice Hall. 2005.
2. Electric Machinery. Fitzgerald A.E. and others. Fifth Edition. McGraw-Hill Book Company, London, 1990.

Assessment

Attendance	5%	
Quiz-1	10%	
Midterm Exam	30%	
Quiz-2	10%	
Final Exam	45%	
Total	100%	

ECTS Allocated Based on the Student Workload

Activities	Number	Duration (hour)	Total Workload
Course duration in class	15	3	45
Labs and Tutorials	-	-	-
Assignments	2	6	12
Project/Presentation/Report Writing	-	-	-
E-learning Activities	10	3	30
Quizzes	2	6	12
Midterm Examination	1	12	12
Final Examination	1	14	14
Self Study	14	3	42
Total Workload			167
ECTS Credit of the Course			6