GAU, Faculty of Engineering

Course Unit Title	Hıgh Voltage Techniques
Course Unit Code	EEN 488
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
Mode of Delivery	Face to Face, E-learning activities
Language of Instruction	English
Prerequisities and co-requisities	EEN303
Recommended Optional Programme Components	Basic bacground Circuit Theory

Objectives of the Course:

- Teaching electrical characteristics of transmission lines, per unit system.
- Teaching non-destructive testing of apparatus(insulation resistance, ets)
- Teaching of HV production for test objects; impulse generators; series resonant a.c. test sets; d.c. test sets
- Understand diffrent types of system overvoltages.
- Teaching the measurement methods for high voltages

Learning Outcomes

When this course has been completed the student should be able to		Assesment.
1	Analize electrical characteristics and modeling of transmission lines.	1
2	Analysis of impulse, dc and ac high voltage. Design high voltage generator.	1
3	Performance(ripple,voltage drop) analysis of HV sources.	1
4	Apply techniques to measure different types of high voltages.	1
5	Conduct experiments and interpret obtained data	1

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			
Week			Exams

1		Introduction	
2	Chapter 3	Representation of power systems with protection zohes.	
3	Chapter 6	Generation of High d.c. Voltages.	
4	Chapter 6	Generation of High Alternating Voltages	
5	Chapter 6	Generation of High Impulse Voltages.	Quiz 1
6	Chapter 6	Generation of High Impulse Currents	
7	Chapter 7	Measurement of High Direct Current Voltages	
8			Midterm
9	Chapter 7	Measurement of High a.c. and Impulse Voltages	
10	Chapter 7	Measurement of High d.c., a.c. and Impulse Currents	
11	Chapter 8	Overvoltage Phenomenon and Insulation Coordination in Electric Power Systems	Quiz 2
12	Chapter 7	Non-Destructive Testing of Materials and Electrical Apparatus	
13		High Voltage Testing of Electrical Apparatus	
14		Homework and assessment practices.	
15			Final Exam

Recommended Sources

Textbook: 1 M S Naidu, V Kamaraju. High voltage engineering.2nd edition, 2006.McGraw-Hill
2. E. Kuffel, W. S. Zaengl, J. Kuffel.High voltage engineering. Newness, 2000.

Supplementary Material (s):
1. C.L. Wadhwa. High Voltage Engineering. New Age International, 2007.
2. - Mazen Abdel-Salam. High-voltage engineering: theory and practice . M. Dekker, 2000.

Assessment

Attendance& E-learning	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(hour)
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
Total Workload/30 (h)			5.67
ECTS Credit of the Course			6