



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401483	High Voltage	3	3 T

INSTRUCTOR/COORDINATOR

Name	Dr. Ziyad S. Almajali
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Office Hours	9:00-10:00 (Sun, Tues, Thurs)

TEXTBOOK

Title	High Voltage Engineering Fundamentals
Author/Year/Edition	E. Kuffel and W. S. Zaengl, NY: Pergamon Press, 2000 2 nd edition
Other Supplemental Materials	
Title	High Voltage Engineering
Author/Year/Edition	C.L. Wadhwa, New age international (P) limited, publishers, New Delhi. 2007

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

General introduction in high voltage systems; conduction and breakdown in gases; conduction and breakdown in liquid dielectrics; breakdown in solid dielectrics; applications of insulating materials; generation of high voltages and currents; measurement of high voltages and currents; Over voltage phenomenon and insulation coordination in electric power systems; non-destructive testing of materials and electrical apparatus; high voltage testing of electrical apparatus; corona.

B. Pre-requisites (P) or Co-requisites (C)

Power systems (2) (0401482) (P)

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Course Learning Outcomes (CLOs)

By the end of this course, the student should be able to:

CLO1: Recognize the different types of over voltages, the system internal over voltages; switching over voltages and the external lightning over voltages [1].

CLO2: design of a High voltage lab. And Recognize its requirements [1].

CLO3: Study of various Generation & Measurement techniques of High Voltage [1].

CLO4: Understand Breakdown phenomenon in various insulation systems, gases, vacuum, solids, and liquids [1].

CLO5: Understand the standard high voltage tests techniques for various system apparatus and the Non-destructive testing [1].

CLO6: Study of Lightning and lightning protection and Principles of Insulation Coordination. [1].

B. Student Learning Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Introduction: Types of high voltages and their applications.	1	3
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• Generation of High Voltages. AC voltage	1	3
• Generation of High Voltages. DC voltage	1	3
• Generation of High Voltages. Impulse voltage	1	3
Measurement of High Voltages.	1	3
Measurement of High Voltages.	1	3
• Breakdown mechanisms in Gases.	2	6
• Breakdown mechanisms in Liquid Dielectrics.	1	3
• Breakdown mechanisms in Solid Dielectrics.	1	3
• Lightning and lightning protection	1	3
• Non-Destructive Testing of Materials and Electrical Apparatus .	1	3
• High Voltage Testing of Electrical Apparatus . Insulation Coordination in Power Systems.	1	3
Total	14	42

EVALUATION		
Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes, Projects, ... etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)		
	Relationship to program outcomes	
ABET 1-7	Engineering Student Outcomes	
1	√	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2		an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3		an ability to communicate effectively with a range of audiences.
4		an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5		an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6		an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7		an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

