



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401585	Protection and High Voltage Lab	1	3T

INSTRUCTOR/COORDINATOR

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TEXTBOOK

Title	High voltage and protection Lab Manual
Author/Year	
Other Supplemental Materials	
Title	
Author/Year	
Electronic Materials	

SPECIFIC COURSE INFORMATION

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

The lab covers two subjects: high voltage and power system protection. In the high voltage experiments, the student will recognize, build and test selected high voltage generation circuits. He will study the effect of high voltage on the insulators and identify the standards of high voltage testing procedures. In the protection experiments. The students will be introduced to different generations of relays; conventional and modern as well. He will be able to compare the performance and apply different protection schemes for various power system apparatus.

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

High Voltage (0401483) (P)
Power System Protection (0401587) (P)

C. Course Type (Required or Elective)

Required

SPECIFIC GOALS

A. Specific Outcomes of Instruction

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

CLO1: be familiar with methods of high voltage testing and protection of selected apparatus in power system [6].

CLO2: To build and test selected circuits for generating high voltages for testing various apparatus and their measurement method [6].

CLO3: To test various protective devices in power system for protecting equipment and personnel. [6]

CLO4: To test and compare conventional and modern protection relays; their Standards and Classification [6].

CLO5: To Work effectively in groups (teamwork) by sharing discuss and analyze the results [5].

B. Student Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7				
				√	√					

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
General introduction to the laboratory	1	2
Instantaneous voltage relay	1	2
Instantaneous current relay	1	2
Oil test	1	2
Static relay and electromechanical relay	1	2
Time lag over current relay	1	2
Voltage multiplier	1	2
Directional relay	1	2
Mid-term exam	1	2
Differential relay	1	2
Over and under voltage relay	1	2
Fault analysis Air insulation test	1	2
Test the electric arc on the insulator	1	2
Distribution of voltages on insulators	1	2
Final Exam	1	2
Total	14	28

EVALUATION		
Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	20
Reports, Quizzes	One week after being assigned	40
Final Exam	According to the university calendar	40

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.