



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401481	Power Systems (1)	3	3 T

INSTRUCTOR/COORDINATOR

Name	Dr. Ziyad Almajali
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TEXTBOOK

Title	Elements of power system analysis
Author/Year	William D. Stevenson
Other Supplemental Materials	
Title	Power System Engineering
Author/Year	Yoshihide Hase, 2007
Electronic Materials	

SPECIFIC COURSE INFORMATION

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

Power system components; single line diagram; per unit system; transmission lines: parameters, equivalent circuits, analysis, and power circle; power flow; active and reactive power control; faults analysis: short circuit fault analysis, open circuit fault analysis, protection

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

Electrical Machines (2) (0401376) (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: To be familiar with the concept of power system concepts: generation, transmission and distribution [1].

CLO2: Evaluate voltage and current calculations of power system equivalent circuits and networks [1].

CLO3: Represent the symmetrical and unsymmetrical faults [1].

CLO4: Demonstrate the basics of power system protection [1].

B. Student Learning 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
Introduction: power system main components, power system in Jordan, main concepts and definitions, single phase and 3 phase power, per unit quantities and one line diagram.	1	3
Transmission line parameters calculations : - resistance - inductance - capacitance	2	6
Characteristics and performance of power transmission lines: transmission line types (short, medium and long lines) equivalent circuits and calculations, power flow through transmission lines, transmission efficiency	2	6
Network calculations: impedance and admittance matrices	2	6
Power flow problem : - active and reactive power calculations - analysis methods - Gauss – Seidel method - Newton – Raphson method - control of voltage profile	2	6
Symmetrical components: - a operator - symmetrical voltages and currents - sequence networks of power system and components	1	3
Symmetrical fault analysis: - Transients on power system and transmission lines - 3 phase short circuit faults	2	6
Unsymmetrical fault analysis: - single line to ground fault - double line to ground fault - line to line fault - one open line fault - double open line fault	1	3
Introduction to power system protection.	1	3
Total	14	42

EVALUATION

Assessment Tool	Due Date	Weight (%)
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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.

