



**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**

<b>Name</b>	Dr. Ziyad Almajali
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**TEXTBOOK**

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

**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
<b>Total</b>	<b>14</b>	<b>42</b>

**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

<b>ABET's Students Learning Outcomes (Criterion # 3)</b>		
<b>Relationship to program outcomes</b>		
<b>ABET 1-7</b>	<b>Engineering Student Outcomes</b>	
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.

