# MUTAH UNIVERSITY
## Faculty of Engineering
## Department of Electrical Engineering

**Course Syllabus**

| Course Code | Course Name | Credits | Contact Hours |
|---|---|---|---|
| 0401484 | Power Systems Programing Laboratory | 1 | 8:00-10:00 Monday |

## INSTRUCTOR/COORDINATOR

| | |
|---|---|
| **Name** | Dr. Ziyad Almajali |
| **Email/Office** | Ziyad@mutah.edu.jo |
| **Office Hours** | 12:00-13:00 Sunday, Tuesday, Thursday |
| **Classroom/Time** | 8:00-10:00 |

## TEXTBOOK

| | |
|---|---|
| **Title** | Lab Manual |
| **Author/Year/Edition** | Prepared by Dr. Khaled Alawasa |

### Other Supplemental Materials

| | |
|---|---|
| **Title** | Power System Analysis and Design |
| **Author/Year/Edition** | J. Duncan Glover, Thomas J. Overbye, Mulukutla S. Sarma 2017 /6$^{th}$ Edition |

## SPECIFIC COURSE INFORMATION

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

he Lab contents are based on the two power system analysis prerequisite courses. The Lab starts by introducing the students to one or more of power systems simulation software packages. The following experiments include analysis and performance assessments of power system networks under normal conditions such as the power flow calculations and faulty conditions as well. Simulations are then developed for transients and stability analysis and performance assessments of power systems.

### 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 Objectives (CLOs)** |
| **CLO1**: Develop a program and use a suitable package to solve the power flow problems for simple power systems [5]. <br> **CLO2**: Use suitable package to study faults at different locations in a power system [6]. <br> **CLO3**: Develop a program in a suitable package to assess system stability [6]. <br> **CLO4**: Use of suitable package to study Transients performance of power transformers [6]. |
| **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 to PowerWorld Simulator | 2 | 4 |
| Power flow calculations | 2 | 4 |
| Power system faults studies | 2 | 4 |
| Transient stability simulation | 2 | 4 |
| Linear system analysis: small signal stability and power system stabilizer | 2 | 4 |
| Eigenvalues and non linear system study(PSAT Simulation): small signal stability and power system stabilizer | 2 | 4 |
| Transients performance of power transformers | 2 | 4 |
| *Total* | *14* | *28* |

## EVALUATION

| Assessment Tool | Due Date | Weight (%) |
| --- | --- | --- |
| Mid Exam | According to the university calendar | 20 |
| Course Work (Homeworks, Quizzes, Projects, …etc.) | 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. |