The University of Jordan
School of Engineering
Electrical Engineering Department
2nd Semester – A.Y. 2023/2024

Course: Power System Planning – 0963582 (3 Cr. – Required Course)

Instructor: Dr. Sereen Althaher

Office: E306, Telephone: 06/5355000 ext 22857, Email: s.thaher@ju.edu.jo

Office Hours: Will be posted soon

Platform: (https://elearning.ju.edu.jo/)

Catalog description: Introduction to power system planning and reliability: definition, objectives and regulations. Power generation reliability: definition, techniques and indices, generation expansions. Transmission and distribution reliability evaluation. Optimal operation of power system: Economic dispatch of thermal generation units, unit commitment, optimal power flow, locational marginal pricing, power system security. Introduction to power system stability and control: basics of power system stability, types of power system stability, transient stability analysis, frequency regulation techniques.

Prerequisites by course: EE 0953481 Power System Analysis (pre-requisite)

Prerequisites by topic: Students are assumed to have a background in the following topics:

- Power system analysis techniques
- Power flow analysis
- Probability and random variables

Textbook:

N/A

References:

1. J. Duncan Glover, Thomas Overbye, Mulukutla S. Sarma, “Power system analysis and design” 2016.
2. Kirschen and Goran Strbac, "Fundementals of power system economics," 2018.
3. A. J. Wood, B. F. Wollenberg, “Power generation, operation and control”, 2013.
5. A. Gómez-Expósito, A. Conejo, C. Cañizares, “Electric energy systems : analysis and operation”, 2018.

Schedule: Blended [16 Weeks, 42 lectures (50 minutes each) including exams]

Course goals: This course provides students with understanding of various aspects related to the planning, operation, control and reliability of power system. This course will also provide students with understanding of the regulatory and industry standards related to real-world power system case studies.

Course learning outcomes (CLO) and relation to ABET student outcomes (SO):

Upon successful completion of this course, a student will: [SO]

1. Assessing and analyzing the reliability of power systems. [1]
2. Applying techniques for optimal operation of power system. [2]
3. Appling techniques for optimal investment and expansion of power system. [2]
4. Understanding the basic concepts of power system stability and control. [7]
5. Applying techniques to solve transient power stability problem. [2]

Course topics:

		Hrs
1.	Introduction to power system planning: objectives, drivers and tools.	3
2.	Reliability of power supply: definition, deterministic and probabilistic approaches.	6
3.	Generation investments and generation expansion	9
4.	Reliability of transmission and distribution networks	6
5.	Generation operational planning, economic dispatch and unit commitment	6
6.	Power system operation planning: optimal power flow and security constraints	6
7.	Introduction to power system stability and control	6

Ground rules:

Attendance is required and highly encouraged. To that end, attendance will be taken every lecture. Eating and drinking are not allowed during class, and cell phones must be set to silent mode. All exams (including the final exam) should be considered cumulative. Exams are closed book. No scratch paper is allowed. You will be held responsible for all reading material assigned, even if it is not explicitly covered in lecture notes. Academic integrity must be maintained.

Assessment & grading policy:

First Exam	Assignments 0%	Midterm Exam 30%	Projects 15% Final Exam 50%
Lab Reports 0%			
Quizzes	0%	Presentation	5%
		Total	100%

Last Revised:

Feb 2024