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**Course:** Power System Planning and Reliability – 0923782 (3 Cr. – Elective Course)

**Catalog Data:** Load forecasting: peak demand and energy. Generating planning: Capacity resource planning (conventional and nonconventional power plants), reliability and capacity reserve, generation expansion, cost analysis. Transmission planning: concepts, corridor selection for determining physical and electrical characteristics of lines to be constructed, reliability analysis. Distribution planning: types of distribution systems, planning for reliability, distribution system engineering: substation location, sizing and feeder location. Impact of renewable generation and deregulation on power system planning.

**Prerequisites by**

**Course:** None

**Textbook:** None

**References:**

- 1) Reliability evaluation of power system.  
By R. Billinton and R. N Allan
- 2) Reliability evaluation of engineering systems: concepts and techniques  
By R. Billinton and R. N. Allan.
- 3) Reliability techniques in large electric power system  
By W. Wang and J. Endreny
- 4) Power system planning.  
By R.L..Sullivan

**Schedule &**

**Duration:** 16 Weeks, 48 lectures, 50 minutes each (including exams).

**Course Objectives:**

Develop an understanding of power system planning and reliability evaluation by using deterministic and probabilistic techniques.

**Course Learning Outcomes and Relation to Program Learning Outcomes:**

Upon successful completion of this course, the student should be able to:

1. Understanding the concept of demand and energy forecast. [i,ii]
2. Identifying the main subsystems of a power system and their constituent components. [i,ii]
3. Understanding the planning of electrical generating, transmission and distribution systems. [i,ii,iii]
4. Ability to evaluate the reliability of generation, transmission and distribution systems. [i,ii,iii]

**Course Topics:**

Topic	Description	Contact Hours
T.1.	Demand and energy forecast.	7
T.2.	Planning and reliability evaluation of generating systems.	10
T.3.	Planning and reliability evaluation of transmission systems.	10
T.4.	Planning and reliability evaluation of distribution systems.	10
T.5.	Impact of renewable generation and deregulation on power system planning.	7

**Computer Usage:** students are encouraged to write/use computer programs for mathematical modelling.

**Attendance:** Class attendance will be taken and the University policy on absence will be followed.

**Assessments:** Exams

**Grading policy:**

Semester work	60 %
Final Exam	40 %
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Total	100%

**Instructor:**

Instructor Name	Office	Ext.	E-mail
Prof. Daifalleh Dalabeih	E 310	22850	<a href="mailto:Daibeih@ju.edu.jo">Daibeih@ju.edu.jo</a>

**Program learning outcomes**

- i** Demonstate a sound, in-depth and up-to-date technical knowledge in the field of specialization.
- ii** Ability to identify and solve engineering problems in their chosen field of study.
- iii** Acquir the skills for continued professional development and independent self-study.
- iv** Demonstrate the ability to communicate technical informatiom effectively and professionally both orally and in writing..

**Last Updated:** 2017-03-23