



Philadelphia University

Faculty of Engineering - Department of Electrical Engineering

Course Details:

- Title:** Electrical Transmission and Distribution Network Design(610515)
- Prerequisite:** Power systems (1) (610411)
- Credit Hours:** 3 credit hours (16 weeks per semester, approximately 45 contact hours)
- Textbook:** Gupta, J.B, Transmission and Distribution of Electrical Power, Nai Sarak Delhi: : S.K.Kateria and Sons, 2004
- References:** Sharma, Sanjay Kumar, AHV-AC, HVDC Transmission and Distribution Engineering, New Delhi: S.K.Kateria and Sons, 2013
- Singh, S.N., Electric Power Generation, Transmission and Distribution, New Delhi: Prentice Hall of India, 2003.
- Kamaraju, V., Electrical Power Distribution Systems, New Delhi: Tata McGraw-Hill Education, 2009
- Course Description:** The course aims to teach students how to design transmission and distribution power system. The students will learn how to choose the ratings of transformers, circuit breakers, and cross sectional area of cables and overhead lines needed to build transmission and distribution system.

Course Outlines:

Week	Topic
1	Techniques of drawing and diagrams
2	Substation layouts, substation design
3	Overhead line conductor and technical specification, conductor selection
4	Design spans and clearances ,overhead line fittings, overhead line impedance
5, 6	Substation bus bar selection, fuse and miniature circuit breakers , fuse operation
6, 8	Cables, types of cables, calculation of losses in cables
9, 10	Switchgear, terminology and standards, switching, operation mechanisms
11, 12, 13	Equipment specifications, structures, towers and poles, structure design, poles and towers types
14, 15	Earthing and bonding: design criteria, substation earthing calculation methodology, insulation coordination
16	Revision

Course Learning Outcomes with reference to ABET Student Outcomes:

Upon successful completion of this course, student should:

1.	Know how to design substations operating at 400/132kV, 132/33kV, 33/11kV, and 11/0.4kV	[a, c, e, h, k]
2.	Understand how to construct the different substation levels together	[a, c, e, h, k]
3.	Know how to choose the proper equipment in the design	[c, e, j]
4.	Learn how to connect the new consumers of different categories (residential, commercial, industrial, etc.) to the national grid	[c, j, k]

Assessment Guidance:

Evaluation of the student performance during the semester (total final mark) will be conducted according to the following activities:

- Sub-Exams:** The students will be subjected to two scheduled written exams, first exam and second exam during the semester. Each exam will cover materials given in lectures in the previous 3-4 weeks.
- Quizzes:** (3-5) quizzes of (10-15) minutes will be conducted during the semester. The materials of the quizzes are set by the lecturer.
- Collective Participation:** Brain storming and collective discussions will be carried out during any lecture. Individual student will be assessed accordingly.
- Final Exam:** The students will undergo a scheduled final exam at the end of the semester covering the whole materials taught in the course.

Grading policy:

First Exam	20%
Second Exam	20%
Quizzes and participation	20%
Final Exam	40%
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Total:	100%

Attendance Regulation:

The semester has in total 16 weeks. Total absence hours from classes must not exceed 15% of the total week. Exceeding this limit without a medical or emergency excuse approved by the deanship will prohibit the student from sitting the final exam and a zero mark will be recorded for the course. If the excuse is approved by the deanship the student will be considered withdrawn from the course.

January, 2018