The University of Texas at Tyler
Department of Electrical Engineering
Houston Engineering Campus

Course: EENG 4110 – Electric Power Systems Laboratory

(Required for students entering the electrical engineering program in or after fall,2016)

Syllabus

Catalog Description:

Magnetic circuits; principles of electromagnetic energy conversion; synchronous machines; three-phase induction machines; Transformers; DC machines; fundamentals of power systems modeling and design; power flow analysis.

Prerequisites: EENG 4310

Credits: 3 (3 hours lecture, 3 hours laboratory per week

Text(s): (Required)

Glover,Overbye and Sarma, Power System Analysis and Design, 6th ed.,
ISBN-10: 1305632133 ; **ISBN-13:** 9781305632134

Additional Material: (Recommended)

Laboratory procedure handouts (provided on-line)

Course Coordinator: Hassan El-Kishky, PhD

Topics Covered:

1. 3-phase Circuits and Systems
2. AC Power
3. Power Transformers
4. Induction Machines
5. Synchronous Machines
6. Power Transmission Line Models
7. Synchronous alternator

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Learning Outcomes (formerly Objectives) [1]: By the end of this course students will be able to:

1. Set up experiments to measure the three-phase power.
2. Set up experiments to determine the equivalent circuit of a power transformer.
3. Set up experiments to determine the voltage regulation of a power transformer.
4. Set up experiments to determine the equivalent circuit of a three-phase induction motor.
5. Set up experiments to determine the torque/slip characteristics three-phase induction motor.
6. Set up experiments demonstrate the voltage regulation of synchronous machines.
7. Set up experiments to determine the characteristics of DC machines.
8. Set up experiments to test power transmission lines.
9. Model electric power system components.
10. Perform load-flow studies of electric power systems.

[1]Numbers in brackets refer to method(s) used to evaluate the course objective.

Relationship to Program Outcomes (only items in dark print apply)[2]: This course supports the following Electrical Engineering Program Outcomes, which state that our students will:

1. Have the ability to apply knowledge of the fundamentals of mathematics, science, and engineering. [1,2,3,4,5,9,10]
2. Have the ability to use modern engineering tools and techniques in the practice of electrical engineering. [1,2,3,4,5,9,10]
3. have the ability to analyze electrical circuits, devices, and systems [1,2,3,4,5,9,10]
4. Have the ability to design electrical circuits, devices, and systems to meet application requirements. [19]
5. Have the ability to design and conduct experiments, and analyze and interpret experimental results. [1,2,3,4,5,9]
6. Have the ability to identify, formulate, and solve problems in the practice of electrical engineering using appropriate theoretical and experimental methods. [9,10]
7. Have effective written, visual, and oral communication skills. [17]
8. possess an educational background to understand the global context in which engineering is practiced, including
   a. Knowledge of contemporary issues related to science and engineering. [10]
   b. The impact of engineering on society. [21]
   c. the role of ethics in the practice of engineering.[13]
9. have the ability to contribute effectively as members of multi-disciplinary engineering teams.[20]
10. Have a recognition of the need for and ability to pursue continued learning throughout their professional careers. [4]

[2]Numbers in brackets refer to course learning outcomes/objective(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:	0	hours
Engineering Sciences and Design:	1	hours
General Education Component:	0	hours

Prepared: Dr. Hassan El-Kishky Date: 08/25/2019