

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: Seyed Ghorshi, 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/paper
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.

¹Numbers 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]

²Numbers 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:

Seyed Ghorshi

Date:

08/22/2018

**The University of Texas at Tyler
Department of Electrical Engineering**

**EENG 4110: Electric Power systems laboratory
2018 Fall Semester**

COURSE OUTLINE

Course Coordinator: Seyed Ghorshi, Electrical Engineering

Class Location/Time: HEC B212 /9:30-11:45 AM Friday

Text(s): Glover, Overbye, Sarma, Power System Analysis and Design, 6th ed. ISBN-10: 1305632133 ISBN-13: 9781305632134

Lab Experiments:

- Equipment Familiarization
- Three phase power measurement
- Single phase transfer testing
- Three phase induction motor testing
- Synchronous alternator
- Transformer tests
- Three phase induction motor running characteristics

Grading:

- Laboratory record: 50%
- Test 1: 25%
- Test 2: 25%

Grading scale:

90-100– A; 80-89–B; 70-79–C; 60-69 – D; <60 – F. Final scores will be rounded to the nearest integer.

Lab Project Policy:

Project reports will be due in lab one week after assignment. Project reports should be written as per the guidelines provided for each experiment. A 25% penalty will be assessed per week for late project reports.

Academic Integrity:

Students should be aware that absolute academic integrity is expected of every student in all undertakings at The University of Texas at Tyler. Failure to comply can result in strong university-imposed penalties.

Students Rights and Responsibilities:

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link:

<http://www.uttyler.edu/wellness/rightsresponsibilities.php>

Grade Replacement/Forgiveness and Census Date Policies:

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Each semester's Census Date can be found on the Contract itself, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar.

Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract.

The Census Date is the deadline for many forms and enrollment actions that students need to be aware of. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a "W" grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid

State-Mandated Course Drop Policy:

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date).

Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability Services

In accordance with federal law, a student requesting accommodation must provide documentation of his/her disability to the Disability Services counselor. If you have a disability, including a learning disability, for which you request an accommodation, please contact the Disability Services office in UC 3150, or call (903) 566-7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

If you intend to be absent for a university-sponsored event or activity, you (or the event sponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement:

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation:

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.