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ETEC 213.50: Power Systems Technology

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Spring 2015

Power Systems Technology Syllabus

COURSE: ETEC 213.50

SEMESTER CREDITS: 3

MEETING TIMES: Online requiring weekly interaction.

Final Exam online or F2F by appointment.

FACULTY: Bradley Layton, PhD PE

CONTACT: Email – bradley.layton@umontana.edu, Phone: 406-243-7865

OFFICE: Griz House 8, Office G

OFFICE HOURS: In-person (recommended) TR 9:00am – 10:30am

PREREQUISITES: ETEC 106, M 121, Prereq/coreq., M122

Course Description:

The course continues the examination of electricity, magnetism, transformers, and their application. It also examines the theory and operation of motors, single-phase and three-phase AC and DC, and control methods for these electrical devices.

Course Objectives:

1. Understand the importance of safety in electrical systems.
2. Describe the operation of transformers.
3. Compute of transformer primary and secondary electrical quantities.
4. Describe the operation of three-phase power.
5. Compute wye-connected and delta-connected electrical quantities.
6. Describe the operation of single-phase and three-phase AC motors.
7. Compute starting torque and starting current of AC motors from locked rotor tests.
8. Describe the operation of three-phase alternators, and compute voltage regulation under load.
9. Describe the operation of DC motors and generators.
10. Describe the compare and contrast the operation of motors, alternators, and generators
11. Describe the types and fundamentals of AC motor control, DC motor control, and sold-state motor control.
12. Implement previous learning by applying math skills, writing skills, teamwork skills, and research techniques.

Required Materials:

Petruzella F. (2010). Electrical Motors and Control Systems. The McGraw Hill Company, Inc.
ISBN-13: 978007352182-4,

Kaiser, J. (1998). Electrical Power: Motors, Controls, Generators, Transformers. Tinley Park, IL: The Goodheart-Willcox Company, Inc.

ISBN-13: 9781566373661, ISBN-10: 1566373662

(Note, this book is out of print and copies are made through the book store for about \$30.00)

Evaluation Procedures:

Assessment Grading Scale

Homework 25%

Online participation (chats, discussions, etc.) 25%

Exams 25%

Final Exam 25%

100% - 90% A

90% - 80% B

80% - 70% C

70% - 60% D

Online Participation:

This is not a correspondence course or a course where you can proceed at your own pace. Active **Forum** participation is required and graded as assigned. **Assignments** are to be submitted due by the assigned time on the assigned date. Weekly **quizzes** are to be taken during the weekly unit. They are sometimes timed, sometimes require calculations. The **final exam** is comprehensive and counts 25% of your grade. For details see the course description on the front page of the on-line class site.

Computer Hardware and Software:

The information for this course is presented in several formats. The student must be able to open and read Microsoft Word as well as PDF files. Numerous web site references will be used. Since several of the documents that will be used in this course are relatively large PDF files, ***the speed of your computer and of your Internet access will impact your online experience.***

Late Work:

- Late assignments loose points (10 pts minimum) and late assignments will be accepted only in extraordinary circumstances, and at the instructor's discretion. If you have an extenuating circumstance that will prohibit you from meeting a deadline, please contact me well in advance of the deadline and I will make reasonable accommodations.
- Missed quizzes or final exam receives a score of 0; there is no makeup for missed quizzes unless previous arrangements are made.

ACADEMIC INTEGRITY:

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by The University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at

[Site for academic integrity](#)

DISABILITY ACCOMMODATION:

Eligible students with disabilities will receive appropriate accommodations in this course when requested in a timely way. Please contact me after class or in my office. Please be prepared to provide a letter from your DSS Coordinator. For more information, visit the [Disability Services website](#) or call 406.243.2243 (voice/text).

CHANGES TO SYLLABI:

NOTE: Instructor reserves the right to modify syllabi and assignments as needed based on faculty, student, and/or environmental circumstances. If changes are made to the syllabus, amended copies will be dated and made available to the class.

Last Syllabus Update: 2/2/2015