ECE 5430 Syllabus, Winter 2007
Electric Energy Systems Engineering

Credit Hours:
4 Credit Hours (LCT 4).

WSU Catalog Description:

Instructor: Caisheng Wang, Assistant Professor of Engineering Technology
Course Meeting Time: Friday, 05:30 PM - 09:20 PM
Course Meeting Location: 0120 MANO
Office Hours: Tuesday and Thursday, 10:00 AM - 12:00 PM
Office Location: 1150 Engineering Technology Building
Phone: (313) 577-7084
Email: cwang@wayne.edu

Prerequisite(s): ECE 4330: Linear Network and System Analysis.
Co-requisite(s): None.

Textbook(s) Required:

Computer Programs:
MATLAB/Simulink and PowerWorld Simulator

Goals:
Understand the theory and methods for analysis and control of power systems. Know how to use power analysis and simulation software such as MATLAB and PowerWorld Simulator.

Course Objectives:
Upon completion of this course the student will be able to:
1. Model the main components in a power system
2. Determine the transmission capacity of a transmission line
3. Carry out power flow studies of power systems.
4. Describe optimal dispatch of power generation
5. Carry out stability analysis of a power system
6. Analyze and design controllers for power systems
Topics:

1. Energy and circuit fundamentals (1 week)
2. An overview of power systems (1 week)
3. Generator and transformer models (1 week)
4. Transmission line model (1 week)
5. Transmission line theory and transmission capacity (2 weeks)
6. Power flow studies (2 weeks)
7. Optimal dispatch of generation (2 weeks)
8. Power system stability (2 weeks)
9. Power system control (2 weeks)

Contributions to the ECE Program Outcomes:

(a) An ability to apply math, science and engineering knowledge. The homework, project, quizzes and exams require direct applications of mathematical, scientific, and engineering knowledge to successfully complete the course.

(c) An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability. The design in the project must be checked against real world operating limits.

(e) Identify, formulate and solve engineering problems. Students must be able to identify and model the system; analyze and solve control problems.

(g) An ability to communicate effectively. Students are required to write a comprehensive report on the project.

(k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. Students taking the course will learn how to use software tools such as MATLAB and other commercial software (PowerWorld Simulator) for solving practical power system problems.

Grading Policy:

Homework 25%
Project 25%
Testes/Quizzes 25%
Final 25%

Grading Scale:

A  93-100
A-  90-92
B+  87-89

http://ece.eng.wayne.edu/~patrick/ecewebsite/ABETsyllabus/Syllabus_ECE5430.htm
B 83-86  
B- 80-82  
C+ 77-79  
C  73-76  
C- 70-72  
D+ 67-69  
D  63-66  
D- 60-62  
F Below 60

WITHDRAWAL POLICY:

Last day to drop with a tuition refund: End of 2nd Week of Semester  
Last day to drop without a notation of W on the transcript: End of 4th Week

Depending on the situation of withdrawal, one of the following grades will be assigned:  
WP: Withdrawal with Passing  
WF: Withdrawal with Failing  
WN: Withdrawal Never Attended

All drop/add activity during the first four weeks should be done by the student through Pipeline.  
Withdrawal after the fourth week requires the instructor’s permission and must be submitted on a Drop/Add form to the Registrar’s Office. Withdrawal after the ‘final drop’ date will only be permitted under exceptional circumstances and requires the permission of the Chair of the ECE department. A failing grade is not an acceptable reason for withdrawal after the ‘final drop’ date.

POLICY ON CHEATING:

Cheating is defined by the University as “intentionally using or attempting to use, or intentionally providing or attempting to provide, unauthorized materials, information, or assistance in any academic exercise.” This includes any group efforts on assignments or exams unless specifically approved by the professor for that assignment/exam. Evidence of fabrication or plagiarism, as defined by the University in its brochure Academic Integrity, will also result in downgrading for the course. Students who cheat on any assignment or during any examination will be assigned a failing grade for the course and may be subject to additional penalties.

University / Department Policies:

- Academic Integrity  
  http://www.doso.wayne.edu/judicial/academic-integrity.htm

Code of Ethics for Engineers:

WSU library has a tutorial that talks about transmitting ideas, plagiarism, copyright, and citing sources. At the end, there is a quiz. You are encouraged to visit this site then take the quiz at
the end.
http://www.lib.wayne.edu/services/instruction_tutorials/searchpath/mod6/contents.html

The following list gives additional sites:
http://onlineethics.org/codes/
http://www.iit.edu/departments/csep/codes/coe/abet-a.html

Last Updated:
   December, 2006

Prepared by: Dr. Caisheng Wang