COURSE SYLLABUS
EE 5373 Unbundling Services of a Deregulated Power System
2003 Spring Semester
Tuesday/Thursday, 2 – 3:20 pm
Room 313WH

INSTRUCTOR: Raymond Shoultz, Ph. D., PE, Professor & Chairman

OFFICE: Room 522NH

OFFICE HOURS: 3:30 – 5 pm, Tuesdays & Thursdays (other times by appointment)

PHONE: (817) 272-3472

MAILBOX: UTA BOX 19016, Arlington, TX 76019

EMAIL: shoultz@uta.edu

INSTRUCTOR WEB SITE: http://www-ee.uta.edu/EEDept/Faculty/shoultz.htm

COURSE WEB SITE: TBA


Final Exam Date/Time: May 6, 2003, 2 – 4:30 pm

Course Catalog Description: The fundamental operating functions of a deregulated power system are presented. Unbundling of these functions and cost allocations are discussed. Topics of ancillary services, power marketing, price forecasting, and load forecasting are covered. Prerequisite: EE5308 or permission of instructor.

Course Learning Goals/Objectives: The objectives of this course include the following.
1. Provide an in-depth coverage of power system operations in the deregulated electricity market environment.
2. Present basic principles of power system operation and economics with an emphasis on recent research in this area.

Attendance: As a graduate student, self-motivation to excel is assumed. Therefore, attendance at each lecture is fully expected from each student.

Drop Policy:
As per University Guidelines. See the Registrar’s Bulletin or the University’s Calendar in the front part of the UTA Catalog, or refer to the web site http://www.uta.edu.
**Tentative Lecture / Schedule (Course Content):**
The following outline of seven topics will be covered. One project will be required with written and oral report.

<table>
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<th>TOPIC</th>
<th>TEXT CHPT</th>
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<td>1. Deregulation of the Electricity Supply Industry</td>
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<td>2. Power System Economic Operation Overview</td>
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<td>4. Transmission Open Access and Pricing Issues</td>
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<td>5. Ancillary Services Management</td>
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<td>6. Reliability and Deregulation</td>
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<td>7. Power Quality Issues</td>
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The following web sites are recommended – they contain considerable information for those students not entirely familiar with power systems in general.

**http://www.ece.umr.edu/areas/power/**
This web site is a collection of useful information that can be used to teach college level courses in power and energy-related issues. While the authors have written some of the material presented here, much of it is available on the internet from various information sources. The information was compiled and made suitable for use in teaching the concepts. This site contains good general information about the power industry.

**http://powerlearn.ee.iastate.edu/main/intro.html**
This site provides a set of instructional modules for use in electric power engineering education. This work, done jointly by Iowa State University and Virginia Tech, was funded through an award from the National Science Foundation (NSF) and the Electric Power Research Institute (EPRI).

**http://www.pserc.cornell.edu/powerweb/**
POWERWEB is an interactive, distributed, Internet-based simulation environment for experimentally testing various power exchange auction markets using human decision makers. As with most existing and proposed electric power markets, POWERWEB assumes the presence of a central agent acting as an independent system operator (ISO) to assure the reliable operation of the physical power system. The POWERWEB environment is designed to run unit commitment and optimal power flow routines against load forecasts in order to provide generation schedules such as those that might be assigned by a Power Exchange (PX).

**http://www.ee.mtu.edu/us_pen/**
The National Science Foundation is promoting the use of electronic communications through the WWW and e-mail list servers for the dissemination of information to power engineering faculty and graduate students at universities in the United States. This set of WWW pages is designed to provide an outlet for faculty and graduate students to disseminate information about funding opportunities, NSF/EPRI. Innovative education grants results, future collaborative projects, and other topics of interest. Future pages will
include information of interest to graduate students and a newsletter about current issues. Besides these web pages faculty, graduate students and post-doctoral students can register to be part of list servers that broadcast information of interest to these groups.

http://www.rpi.edu/~durlim/Elab.wrl
This site provides a look at a teaching lab at RPI.

Additional web sites:

- http://www.eia.doe.gov
- http://www.ferc.fed.us
- http://www.nerc.com
- http://europa.eu.int/comm/eurostat
- http://www.m-co.co.nz
- http://www.nyiso.com
- http://www.pjm.com
- http://www.nordpooLno
- http://www.svk.se
- http://www.fingrid.fi
- http://www.statnett.no
- http://www.eltra.dk
- http://www.stem.se
- http://www.ofgem.gov.uk
- http://www.transpower.co.nz
- http://cercind.org/
- http://www.caiso.com/
- http://www.nationalgrid.com/UK

US Energy Information Administration
US Federal Energy Regulatory Commission
North American Electricity Reliability Council
Energy related statistics of EU
New Zealand market operator
New York ISO
PJM Interconnection, US
Nordic market operator
Swedish ISO
Finnish ISO
Norwegian ISO
Danish ISO
Swedish National Energy Administration
UK regulator
Australian market operator and ISO
New Zealand ISO
Central Regulatory Authority of India
California ISO
pool operator and ISO

Specific Course Requirements:

- Mid-Term Exam: One, worth 25%
- Final Exam: One, worth 30%
- Homework: Assigned as appropriate, worth 10%
- Project: One project, worth 35%
- Make-up Work: Make-up work (exams, homework, or project) is not allowed unless circumstances warrant (i.e., beyond the control of the student).

Grading Policy:

Grading Format:
The Final Grade average will be computed in the following manner:

\[ \text{FG}_{\text{avg}} = \text{Mid-Term Exam} \times 0.25 + \text{Final Exam} \times 0.30 + \text{HW}_{\text{avg}} \times 0.10 + \text{Project} \times 0.35 \]

Final Grade Ranges:
90 – 100  A
80 – <90  B
70 – <80  C
60 – <70  D
0 – <60  F

Student Evaluation of Teaching:
Instructor Evaluation forms will be provided at the end of the semester and you will be asked to complete these. These evaluation forms provide valuable feedback that can be used to modify and improve course content and presentation.

Americans with Disabilities Act:
The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112—The Rehabilitation Act of 1973 as amended. With the passage of new federal legislation entitled Americans with Disabilities Act – (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide “reasonable accommodation” to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.

If you require an accommodation based on disability, I would like to meet with you in the privacy of my office, during the first week of the semester, to make sure you are properly accommodated.

Academic Dishonesty:
It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University.

***** ANY CHEATING WILL RESULT IN SEVERE PENALTIES *****

“Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” (Regents’ Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22).