

APPLICATION FOR NEW COURSE

1. Submitted by the College of Engineering Date: 10/29/2009
Department/Division proposing course: Electrical and Computer Engineering
2. Proposed designation and Bulletin description of this course:
- a. Prefix and Number EE 535
- b. Title* Power systems: generation, operation and control
*If title is longer than 24 characters, write a sensible title (24 characters or less) for use on transcripts:
PWR SYS GEN OPER CON
- c. Courses must be described by at least one of the categories below. Include the number of actual contact hours per week for each category, as applicable.
- () CLINICAL () COLLOQUIUM () DISCUSSION () LABORATORY () LECTURE
() INDEPEND. STUDY () PRACTICUM () RECITATION () RESEARCH () RESIDENCY
() SEMINAR () STUDIO () OTHER – Please explain: _____
- d. Please choose a grading system: Letter (A, B, C, etc.) Pass/Fail
- e. Number of credit hours: 3
- f. Is this course repeatable? YES NO If YES, maximum number of credit hours: _____
- g. Course description:
This course covers essential aspects of the energy management system of power systems. Will cover topics: power system economics, state estimation, power system stability, power quality, and fault location.
- h. Prerequisite(s), if any:
EE 537 or concurrent, and Engineering Standing.
- i. Will this course be offered through Distance Learning? YES NO
If YES, please identify one of the methods below that reflects how the majority of the course content will be delivered:
- Internet/Web-based Interactive video Extended campus Kentucky Educational Television (KET/teleweb) Other
Please describe "Other": _____
3. Teaching method: N/A Community-Based Experience Service Learning Component Both
4. To be cross-listed as: _____
Prefix and Number Signature of chair of cross-listing department
5. Requested effective date (term/year): _____ fall / 2010

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6. Course to be offered (please check all that apply): Fall Spring Summer
7. Will the course be offered every year? YES NO
If NO, please explain: _____
8. Why is this course needed?
This course provides students an in-depth understanding of energy management system of modern power systems. Existing courses do not cover related topics. This course has been offered as EE599/699 twice and needs to be assigned an official course number.
9. a. By whom will the course be taught? Dr. Yuan Liao
- b. Are facilities for teaching the course now available? YES NO
If NO, what plans have been made for providing them?

10. What yearly enrollment may be reasonably anticipated?
20
11. a. Will this course serve students primarily within the department? Yes No
- b. Will it be of interest to a significant number of students outside the department? YES NO
If YES, please explain.
12. Will the course serve as a University Studies Program course[†]? YES NO
If YES, under what Area? _____
[†]AS OF SPRING 2007, THERE IS A MORATORIUM ON APPROVAL OF NEW COURSES FOR USP.
13. Check the category most applicable to this course:
- traditional – offered in corresponding departments at universities elsewhere
 - relatively new – now being widely established
 - not yet to be found in many (or any) other universities
14. Is this course applicable to the requirements for at least one degree or certificate at UK? Yes No
15. Is this course part of a proposed new program? YES NO
If YES, please name: _____
16. Will adding this course change the degree requirements for ANY program on campus? YES NO
If YES[‡], list below the programs that will require this course:

[‡]In order to change the program(s), a program change form(s) must also be submitted.



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17. The major teaching objectives of the proposed course, syllabus and/or reference list to be used are attached.
18. Check box if course is 400G or 500. If the course is 400G- or 500-level, you must include a syllabus showing differentiation for undergraduate and graduate students by (i) requiring additional assignments by the graduate students; and/or (ii) the establishment of different grading criteria in the course for graduate students. (See SR 3.1.4)

19. Within the department, who should be contacted for further information about the proposed new course?

Name: Yuan Liao Phone: 859-257-6064 Email: yliao@engr.uky.edu

20. Signatures to report approvals:

<u>11/23/2009</u> DATE of Approval by Department Faculty	Larry Holloway  <small>printed name</small> Reported by Department Chair <small>signature</small>
<u>03/26/10</u> DATE of Approval by College Faculty	RICHARD J. SWEIGARD  <small>printed name</small> Reported by College Dean <small>signature</small>
<u>4/27/2010</u> * DATE of Approval by Undergraduate Council	/ <small>printed name</small> Reported by Undergraduate Council Chair <small>signature</small>
* DATE of Approval by Graduate Council	/ <small>printed name</small> Reported by Graduate Council Chair <small>signature</small>
* DATE of Approval by Health Care Colleges Council (HCCC)	/ <small>printed name</small> Reported by Health Care Colleges Council Chair <small>signature</small>
* DATE of Approval by Senate Council	/ Reported by Office of the Senate Council
* DATE of Approval by University Senate	/ Reported by Office of the Senate Council

*If applicable, as provided by the *University Senate Rules*

EE 535 Power System Generation, Operation and Control, Fall Term 2010

Class Time: 10:00 - 10:50 PM on Monday, Wednesday and Friday

Room: FPAT 267

Instructor: Yuan Liao

Office: 691 FPAT, **Phone:** 859-257-6064, **Email:** yliao@engr.uky.edu

Office hours: 11:00 – 12:00 AM on Monday, Wednesday and Friday.

Text: Lecture notes prepared by the instructor. Students can borrow from the reserved folder in the Engineering library and make a copy.

References:

- (1) Power Systems Analysis, J. J. Grainger and W. D. Stevenson Jr., McGraw Hill, 1994
- (2) Power System Stability and Control, P. Kundur, McGraw Hill, 1994.
- (3) R. C. Dugan, M. F. McGranaghan, and H. W. Beaty, Electrical Power Systems Quality, McGraw-Hill, New York, NY, 1996.
- (4) Research papers distributed to class

Course Description: This course covers essential aspects of the energy management system of power systems such as power system economics, state estimation, and power quality.

Prerequisites: Engineering Standing or consent of the instructor

Topics: power system economics, state estimation, power quality, power angle stability, fault location

Learning Outcomes: Upon completion of this course the students should be able to:

1. Solve power system economics problems
2. Solve basic state estimation problems
3. Understand basic concepts of power quality and apply common techniques for analyzing power quality problems
4. Understand basic concepts of power angle stability and examine angle stability utilizing single machine connected to infinite bus model
5. Calculate fault location using state of the art techniques

Exam: None

Project:

Homework 1: power system economics: due on 9/10/2010, Friday

Homework 2: state estimation: due on 10/01/2010, Friday

Homework 3: power quality: due on 10/29/2010, Friday

Homework 4: power angle stability: 11/19/2010, Friday

Homework 5: fault location: 12/10/2010, Friday

Grading

Homework 20% each

>= 90: A; >=80: B; >=70: C; >=60: D; <60: E for undergraduate students

>= 90: A; >=80: B; >=70: C; <60: E for graduate students

Requests for corrections to grades must be made in writing within 14 calendar days of the time you receive your work back. After that no changes will be made even if there was an error in grading. You must state clearly the grading errors in the request.

Graduate students will have extra problems for each assignment.

POLICIES

Attendance: Attendance of lecture is not required, but the student is responsible for any material covered during lecture periods.

Excused Absences: acceptable reasons for excused absences include serious illness, illness or passing away of family member, university-related trips, major religious holidays, as listed at <http://www.uky.edu/Ombud/policies.php>.

Make-up opportunity: for an excused absence, students will be given the opportunity to make up missed assignments. It is the student's responsibility to inform the instructor of the absence preferably in advance, but no later than one week after it.

Verification of Absences: students should provide valid verification of absences, as explained at: <http://www.uky.edu/Ombud/policies.php>.

Submission of Assignments: Assignments can be submitted in class, or submitted to my office, or submitted through email.

Academic integrity, cheating and plagiarism: Cheating and plagiarism is absolutely unacceptable, and violation will result in failure of this course. Details of this policy is referred to: <http://www.uky.edu/Ombud/policies.php>.

Class behavior, decorum and civility: The university (and college/department) is committed to respecting the dignity of all and to value differences among members of our academic community, and fostering academic discovery. Students should demonstrate appropriate decorum and civility. Details of this policy is referred to: <http://www.uky.edu/Ombud/policies.php>.

Professional preparation: N/A

Group work and student collaboration: N/A