

APPLICATION FOR NEW COURSE

1. Submitted by the College of Engineering Date: April 28, 2008

Department/Division proposing course: Electrical and Computer Engineering

2. Proposed designation and Bulletin description of this course:

a. Prefix and Number EE 539

b. Title* Power Distribution Systems

*If title is longer than 24 characters, offer a sensible title of 24 characters or less: Power Distribution Sys.

c. Courses must be described by at least one of the categories below. Include number of actual contact hours per week.

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:

Study of electric utility distribution power systems. Topics include configurations, equipment, customer class data, load flow, phase balancing, capacitor placement, system protection, power quality, and distributed generation.

h. Prerequisite(s), if any:

EE 537, Engineering Standing or consent of instructor.

i. Will this course also be offered through Distance Learning? YES NO

If YES, please check one of the methods below that reflects how the majority of the course content will be delivered:

Internet/Web-based

Interactive video

Extended campus

3. Supplementary teaching component: N/A or Community-Based Experience Service Learning Both

4. To be cross-listed as: _____ MORTORIUM ON APPROVAL OF _____
Prefix and Number printed name Cross-listing Department Chair signature

5. Requested effective date (term/year): Fall / 2008

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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: Student demand and instructor staffing.

8. Why is this course needed?

Discusses electric utility power distribution systems. Has additional application to the manufacturing and mining industries. Enhances Power Engineering Curriculum. Extremely popular course.

9. a. By whom will the course be taught? Dr. Paul Dolloff
- 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?
25 students per class offering; 50 students if taught two semesters per year.

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 MORTORIUM 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: Dr. Paul Dolloff Phone: 859-745-9389 Email: Paul.Dolloff@ekpc.coop

20. Signatures to report approvals:

August 21, 2008	Dr. Larry Holloway
DATE of Approval by Department Faculty	printed name Reported by Department Chair signature
Nov 20, 2008	RICHARD J. SWEIGARD
DATE of Approval by College Faculty	printed name Reported by College Dean signature
* DATE of Approval by Undergraduate Council	/
* DATE of Approval by Graduate Council	printed name Reported by Graduate Council Chair signature
* DATE of Approval by Health Care Colleges Council (HCCC)	/
* DATE of Approval by Senate Council	printed name Reported by Health Care Colleges Council Chair signature
* DATE of Approval by University Senate	/
* DATE of Approval by University Senate	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*

Course Syllabus

EE 539 (599-004) – Electric Power Distribution
SPRING 2009
Tuesday & Thursday 5:00 - 6:15
Classroom: RGAN 207

Instructor: Paul A. Dolloff, Ph.D.
Office: FPAT 585

Contact Information

Email: Paul.Dolloff@ekpc.coop (NOTE: “.coop”)
Phone 859/745-9389 work (direct)
859/744-4812 work (operator)
859/749-2524 cellular
859/527-3501 home
859/744-6008 FAX

Textbook

There is no official textbook for this course. Relevant reading material will be on file in the Engineering Library – third floor, Anderson Tower.

Resources: NOT REQUIRED

“Power Distribution Engineering, Fundamentals and Applications,” James J. Burke, 1994 Marcel Dekker
“Distribution System Modeling and Analysis,” William H. Kersting, 2002 CRC Press
“Electric Power Distribution Handbook,” T. A. Short, 2004 CRC Press

Outcomes

Basic understanding of electric utility distribution power systems including:

1. Understanding of distribution system design and functionality
2. Understanding of equipment and switch gear function
3. Understanding of over-current protection and coordination

Lecture Topics

1. Electric utility distribution systems
 - a. Configurations
 - b. Equipment (transformers, regulators, capacitors, etc.)
 - c. Customer classes and associated load characteristics

2. System Analysis
 - a. Load flow - Discrete ascent optimal programming
 - b. Phase balancing
 - c. Capacitor placement
 - i. Voltage support
 - ii. Loss minimization
3. System Protection
 - a. Equipment (fuse, ct, pt, relay, breaker, recloser)
 - b. Schemes
 - i. Over-current
 - ii. Differential
 - iii. Coordination
4. Power Quality
 - a. Corona
 - b. Stray voltage
 - c. Motor starting
 - d. Cold load pickup
5. Distributed Generation
 - a. Impacts
 - b. Net metering
6. Other Issues
 - a. Economic dispatch (transmission)
 - b. SCADA and metering
 - c. Rates

Field Trips

There will be a field trip to East Kentucky Power Cooperative to be scheduled during a class period. The trip will include a lecture on economic dispatch and a tour of the EKPC 24-hour dispatch center.

Depending upon time, weather, and student interest, a substation and/or power plant tour is possible.

Rates Lecture

This course may include a guest lecture program discussing the process by which an electric utility requests a rate change – a request to charge the customer more or less for electricity. This class period will include a mock hearing as if being held before the Kentucky Public Service Commission.

Examinations

There will be three (3) exams and a final exam; there is no mid-term exam. The first three exams will be scheduled during the course of the class and may be in take-home

form. The final exam will be either given during, or will be due on, the University's scheduled time. In either case, the final exam will be comprehensive.

Makeup exams will be allowed only after receiving permission from the instructor prior to the exam's scheduled time.

Homework

Periodically, homework assignments will be made and collected for grade.

Attendance

Attendance shall not be taken; however, attendance is strongly encouraged as much of the course material will be taken from the instructor's notes and experiences.

Graduate Credit

A class project will be required of all students taking this course for graduate course credit. Grade weightings for graduate students will be adjusted accordingly.

Grade Weightings

Each assignment carries the following overall course percentage:

	Undergraduate	Graduate
Exam 1	25%	20%
Exam 2	25%	20%
Exam 3	25%	20%
Final Exam	15%	15%
Homework	10%	10%
Project	N/A	15%

Grading System

Unless the performance or circumstances associated with a particular student indicate otherwise, the final grade in the course will be based on the following scale:

	Undergraduate	Graduate
90-100	A	A
80-89	B	B
70-79	C	C
60-69	D	E
Below 60	E	E