e

Courses | Request Tracking

New Course Form

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Attachments:

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	ID	Attachment
Delete	763	EE 532-new.pdf

First 1 Last

Select saved project to retrieve...

(*denotes required fields)

1. General Information

a. * Submitted by the College of: ENGINEERING Today's Date: 11/19/2012

b. * Department/Division: Electrical and Computer Engineering

c.
* Contact Person Name: Dr. Yuan Liao Email: yliao@engr.uky.edu Phone: 859-257-6064
* Responsible Faculty ID (if different from Contact) Email: Phone:

d. * Requested Effective Date: ◉ Semester following approval OR ○ Specific Term/Year [1]

e.
Should this course be a UK Core Course? ○ Yes ◉ No
If YES, check the areas that apply:

☐ Inquiry - Arts & Creativity	☐ Composition & Communications - II
☐ Inquiry - Humanities	☐ Quantitative Foundations
☐ Inquiry - Nat/Math/Phys Sci	☐ Statistical Inferential Reasoning
☐ Inquiry - Social Sciences	☐ U.S. Citizenship, Community, Diversity
☐ Composition & Communications - I	☐ Global Dynamics

2. Designation and Description of Proposed Course.

a. * Will this course also be offered through Distance Learning? ○ Yes [4] ◉ No

b. * Prefix and Number: EE 532

c. * Full Title: Smart Grid: Automation and Control of Power Systems

d. Transcript Title (if full title is more than 40 characters): Smart Grid: Automation & Ctrl of Pwr Sys

e. To be Cross-Listed [2] with (Prefix and Number):

f. * Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours [3] for each meeting pattern type.

3	Lecture		Laboratory [1]		Recitation		Discussion
	Indep. Study		Clinical		Colloquium		Practicum
	Research		Residency		Seminar		Studio
	Other	If Other, Please explain:					

g. * Identify a grading system: ◉ Letter (A, B, C, etc.) ○ Pass/Fail

h. * Number of credits: 3

i. * Is this course repeatable for additional credit? ○ Yes ◉ No
If YES: Maximum number of credit hours:
If YES: Will this course allow multiple registrations during the same semester? ○ Yes ○ No

j. * Course Description for Bulletin:
This course covers introduction to smart grid, key technologies in transmission and distribution systems enabling smart grid, power market structure, and real time pricing.

k. Prerequisites, if any:
Engineering standing, or consent of instructor

l. Supplementary teaching component, if any: ○ Community-Based Experience ○ Service Learning ○ Both

3. * Will this course be taught off campus? ○ Yes ◉ No

If YES, enter the off campus address:

4. Frequency of Course Offering.

a. * Course will be offered (check all that apply): ☐ Fall ☑ Spring ☐ Summer ☐ Winter

b. * Will the course be offered every year? ◉ Yes ○ No

If No, explain:

5. * Are facilities and personnel necessary for the proposed new course available? ◉ Yes ○ No

If No, explain:

6. * What enrollment (per section per semester) may reasonably be expected? 16

7. Anticipated Student Demand.

a. * Will this course serve students primarily within the degree program? ◉ Yes ○ No

b. * Will it be of interest to a significant number of students outside the degree pgm? ○ Yes ◉ No

If YES, explain:

8. * Check the category most applicable to this course:

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere
☐ Relatively New – Now Being Widely Established
☑ Not Yet Found in Many (or Any) Other Universities

9. Course Relationship to Program(s).

a. * Is this course part of a proposed new program? ○ Yes ◉ No

If YES, name the proposed new program:

b. * Will this course be a new requirement [5] for ANY program? ○ Yes ◉ No

If YES [5], list affected programs::

10. Information to be Placed on Syllabus.

a. * Is the course 400G or 500? ◉ Yes ○ No
If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in **10.b**. You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR 3.1.4.)

b. ☑ * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from **10.a** above) are attached.

[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.
[2] The chair of the cross-listing department must sign off on the Signature Routing Log.
[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from SR 5.2.1)
[4] You must also submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.
[5] In order to change a program, a program change form must also be submitted.

Rev 8/09

Submit as New Proposal | Save Current Changes | Delete Form Data and Attachments

NEW COURSE FORM

1. **General Information.**

   a. Submitted by the College of: Engineering Today's Date: 10/21/2011

   b. Department/Division: Electrical & Computer Engineering

   c. Contact person name: Dr. Yuan Liao Email: yliao@engr.uky.edu Phone: 859-257-6064

   d. Requested Effective Date: ☒ Semester following approval OR ☐ Specific Term/Year[1]: _____

2. **Designation and Description of Proposed Course.**

   a. Prefix and Number: EE 532

   b. Full Title: Smart Grid: Automation and Control of Power Systems

   c. Transcript Title (if full title is more than 40 characters): Smart Grid: Automation & Ctrl of Pwr Sys

   d. To be Cross-Listed[2] with (Prefix and Number): _____

   e. Courses must be described by at least one of the meeting patterns below. Include number of actual contact hours[3] for each meeting pattern type.

   3 Lecture _____ Laboratory[4] _____ Recitation _____ Discussion _____ Indep. Study

   _____ Clinical _____ Colloquium _____ Practicum _____ Research _____ Residency

   _____ Seminar _____ Studio _____ Other – Please explain: _____

   f. Identify a grading system: ☒ Letter (A, B, C, etc.) ☐ Pass/Fail

   g. Number of credits: 3

   h. Is this course repeatable for additional credit? YES ☐ NO ☒

   If YES: Maximum number of credit hours: _____

   If YES: Will this course allow multiple registrations during the same semester? YES ☐ NO ☐

   i. Course Description for Bulletin: This course covers introduction to smart grid, key technologies in transmission and distribution systems enabling smart grid, power market structure, and real time pricing.

   j. Prerequisites, if any: Engineering standing, or consent of instructor

   k. Will this course also be offered through Distance Learning? YES[4] ☐ NO ☒

   l. Supplementary teaching component, if any: ☐ Community-Based Experience ☐ Service Learning ☐ Both

3. **Will this course be taught off campus?** YES ☐ NO ☒

4. **Frequency of Course Offering.**

   a. Course will be offered (check all that apply): ☐ Fall ☒ Spring ☐ Summer

---

[1] Courses are typically made effective for the semester following approval. No course will be made effective until all approvals are received.

[2] The chair of the cross listing department must sign off on the Signature Routing Log.

[3] In general, undergraduate courses are developed on the principle that one semester hour of credit represents one hour of classroom meeting per week for a semester, exclusive of any laboratory meeting. Laboratory meeting, generally, represents at least two hours per week for a semester for one credit hour. (from *SR 5.2.1*)

[4] You must *also* submit the Distance Learning Form in order for the proposed course to be considered for DL delivery.

b. Will the course be offered every year? YES ☒ NO ☐

If NO, explain: _____

5. **Are facilities and personnel necessary for the proposed new course available?** YES ☒ NO ☐

If NO, explain: _____

6. **What enrollment (per section per semester) may reasonably be expected?** 16

7. **Anticipated Student Demand.**

a. Will this course serve students primarily within the degree program? YES ☒ NO ☐

b. Will it be of interest to a significant number of students outside the degree pgm? YES ☐ NO ☒

If YES, explain: _____

8. **Check the category most applicable to this course:**

☐ Traditional – Offered in Corresponding Departments at Universities Elsewhere

☐ Relatively New – Now Being Widely Established

☒ Not Yet Found in Many (or Any) Other Universities

9. **Course Relationship to Program(s).**

a. Is this course part of a proposed new program? YES ☐ NO ☒

If YES, name the proposed new program: _____

b. Will this course be a new requirement[5] for ANY program? YES ☐ NO ☒

If YES[5], list affected programs: _____

10. **Information to be Placed on Syllabus.**

a. Is the course 400G or 500? YES ☒ NO ☐

If YES, the *differentiation for undergraduate and graduate students must be included* in the information required in ***10.i*** . You must include: (i) identification of additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See *SR 3.1.4.*)

b. ☒ The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if applicable, from ***10.a*** above) are attached.

[5] In order to change a program, a program change form must also be submitted.

NEW COURSE FORM

Signature Routing Log

General Information:

Course Prefix and Number: EE 532

Proposal Contact Person Name: Dr. Yuan Liao Phone: 8592576064 Email: yliao@engr.uky.edu

INSTRUCTIONS:

Identify the groups or individuals reviewing the proposal; note the date of approval; offer a contact person for each entry; and obtain signature of person authorized to report approval.

Internal College Approvals and Course Cross-listing Approvals:

Reviewing Group	Date Approved	Contact Person (name/phone/email)	Signature
Power and Energy Institute Faculty	Dec 14, 2011	Larry Holloway 17-8042 / holloway@engr.uky.edu	
Electrical and Computer Engineering	Jan 16, 2012	Larry Holloway 17-8042 / holloway@engr.uky.edu	
Engineering Faculty	4/24/12	rick.sweigard@uky.edu 78827 Rick Sweigard	
		/ /	
		/ /	

External-to-College Approvals:

Council	Date Approved	Signature	Approval of Revision[6]
Undergraduate Council			
Graduate Council			
Health Care Colleges Council			
Senate Council Approval		University Senate Approval	

Comments:

[6] Councils use this space to indicate approval of revisions made subsequent to that council's approval, if deemed necessary by the revising council.

EE 532
Smart Grid: Automation and Control of Power System

Instructor: Dr. Yuan Liao
Office Address: 691 FPAT
Email: yliao@engr.uky.edu
Office Phone: 257-6064

Office hours: Monday
1 to 1:50 PM

Course Description:

This course covers introduction to smart grid, key technologies in transmission and distribution systems that enable smart grid, power market structure, and real time pricing.

Prerequisites:

Engineering standing, or consent of instructor

Student Learning Outcomes:

After completing this course, the student will be able to:
1. Describe what smart grid is, and describe various issues related to smart grid technology deployment
2. Calculate real time electricity price
3. Summarize key technologies in distribution systems that enable smart grid, and apply selected technologies to power systems
4. Summarize key technologies in transmission systems that enable smart grid, and analyze applications of the technologies

Required Materials:

Textbooks are not required. Recommended readings are:

(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) PSS/E 30.2, Manuals (*Users Manual*, etc.) Siemens Power Transmission and Distribution, Inc., November 2005.
(4) DOE web sites

Course Assignments

4 projects at 25 points each for undergraduate students; 5 projects at 20 points each for graduate students;

Project 1: Introduction to smart grid: write a report on what the smart grid is, benefits, risks, regulatory issues related to smart grid technology deployment.

Project 2: Real time pricing: numerically solve real time pricing problems using sample power systems considering unit generation costs, unit capacity constraints, and transmission constraints.

Project 3: Distribution system technology: perform modeling and simulation studies in one of the following areas: micro-grid, intelligent islanding, energy storage, issues related to distributed resource integration, smart metering, and voltage and reactive power control.

Project 4: Transmission system technology: perform modeling and simulation studies in one of the following areas: Application of phasor measurement units for wide area monitoring, protection and control, fault detection, isolation and system restoration, and energy storage.

Project 5: Reactive power optimization (for graduate students only): numerically solving the problem of optimizing capacitor placement and voltage regulator settings in a distribution system.

Course Grading

For undergraduate student, the Letter Grade will be determined from the numeric grade as:
>= 90: A; >=80: B; >=70: C; >=60: D; <60: E

For graduate student, the grading scale will be:
>= 90: A; >=80: B; >=70: C; <70: E

Graduate students have one more project than undergraduate students.

Final Exam Information

No final exam

Mid-term Grade (for 100-400 level courses, and for undergraduates in 500 level courses)

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (http://www.uky.edu/Registrar/AcademicCalendar.htm).

Course Policies:

Submission of Assignments

Assignments can be submitted in hardcopy or electronic copy. Late assignments will not be accepted. Requests for corrections to grades must be made in writing within 14 calendar days of the time your grade is given. 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.

Attendance Policy

All students are expected to come to class alert and ready to participate. Please refer to

the Senate Policy on excused absences.

Excused Absences
Students need to notify the professor of absences prior to class when possible. S.R. 5.2.4.2 defines the following as acceptable reasons for excused absences: (a) serious illness, (b) illness or death of family member, (c) University-related trips, (d) major religious holidays, and (e) other circumstances found to fit "reasonable cause for nonattendance" by the professor.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Verification of Absences
Students may be asked to verify their absences in order for them to be considered excused. Senate Rule 5.2.4.2 states that faculty have the right to request "appropriate verification" when students claim an excused absence because of illness or death in the family. Appropriate notification of absences due to university-related trips is required prior to the absence.

Academic Integrity
Per university policy, students shall not plagiarize, cheat, or falsify or misuse academic records. Students are expected to adhere to University policy on cheating and plagiarism in all courses. The minimum penalty for a first offense is a zero on the assignment on which the offense occurred. If the offense is considered severe or the student has other academic offenses on their record, more serious penalties, up to suspension from the university may be imposed.

Plagiarism and cheating are serious breaches of academic conduct. Each student is advised to become familiar with the various forms of academic dishonesty as explained in the Code of Student Rights and Responsibilities. Complete information can be found at the following website: http://www.uky.edu/Ombud. A plea of ignorance is not acceptable as a defense against the charge of academic dishonesty. It is important that you review this information as all ideas borrowed from others need to be properly credited.

Part II of *Student Rights and Responsibilities* (available online http://www.uky.edu/StudentAffairs/Code/part2.html) states that all academic work, written or otherwise, submitted by students to their instructors or other academic

supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about the question of plagiarism involving their own work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgement of the fact, the students are guilty of plagiarism. Plagiarism includes reproducing someone else's work, whether it be a published article, chapter of a book, a paper from a friend or some file, or something similar to this. Plagiarism also includes the practice of employing or allowing another person to alter or revise the work which a student submits as his/her own, whoever that other person may be.

Students may discuss assignments among themselves or with an instructor or tutor, but when the actual work is done, it must be done by the student, and the student alone. When a student's assignment involves research in outside sources of information, the student must carefully acknowledge exactly what, where and how he/she employed them. If the words of someone else are used, the student must put quotation marks around the passage in question and add an appropriate indication of its origin. Making simple changes while leaving the organization, content and phraseology intact is plagiaristic. However, nothing in these Rules shall apply to those ideas which are so generally and freely circulated as to be a part of the public domain (Section 6.3.1).

Please note: Any assignment you turn in may be submitted to an electronic database to check for plagiarism.

Accommodations due to disability
If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address: jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Tentative Course Schedule

A linear listing of topics, assignment due dates, and examination dates are as follows:

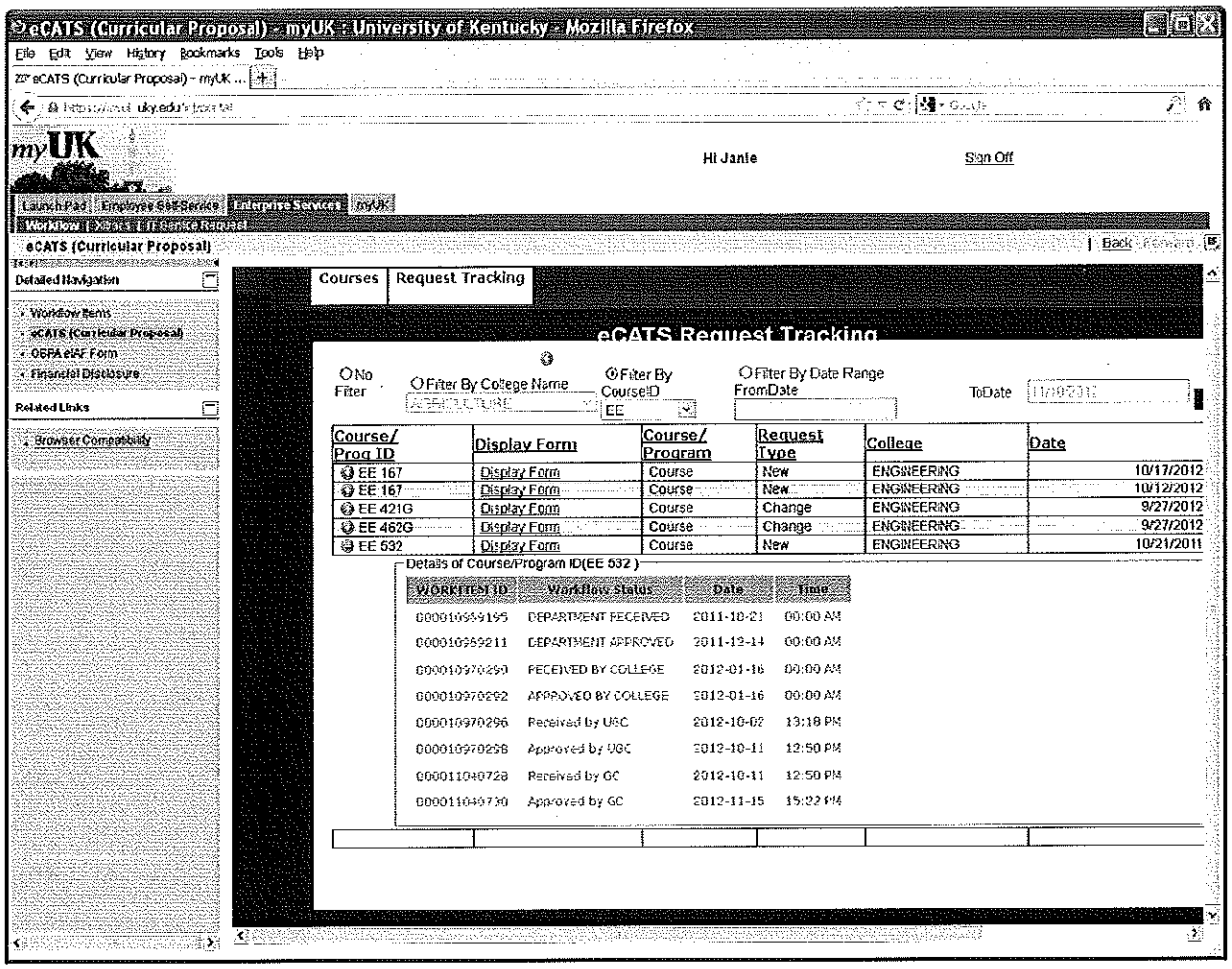
Topics:

- Introduction to smart grid
- Power transmission and distribution system introduction
- SCADA, EMS, DMS
    - Transmission, Distribution automation
    - Resource optimization
    - Fault detection, isolation and system restoration
- FACTS, PMU, wide area monitoring, protection, control
- Smart metering

- Demand side management
-Micro-grid, intelligent islanding
- Power market
    -Structure
    -Real time pricing
-Voltage regulation, reactive power optimization
- Renewable energies (wind, hydro, solar), Energy Storage
- Integration of distributed resources
    -IEEE standards
    -Voltage regulation
    -Protection issues
- Other issues (brief discussion)
    -NIST standards
    -Regulatory issues
    -Cyber security
    -Communication

Project due date:

Project 1: Feb 7
Project 2: Feb 28
Project 3: March 21
Project 4: April 11
Project 5: April 29


eCATS (Curricular Proposal) - myUK - University of Kentucky - Mozilla Firefox
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myUK
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Sign Off
Launch Pad | Employee Self-Service | Enterprise Services | myUK
Workflow | Inbox | IT Service Request
eCATS (Curricular Proposal)
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eCATS (Curricular Proposal)
OBRA eIAF Form
Financial Disclosure
Related Links
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Courses
Request Tracking
eCATS Request Tracking
No Filter
Filter By College Name
AGRICULTURE
Filter By CourseID
EE
Filter By Date Range
FromDate
ToDate
Course/ Prog ID
Display Form
Course/ Program
Request Type
College
Date
EE 167 Display Form Course New ENGINEERING 10/17/2012
EE 167 Display Form Course New ENGINEERING 10/12/2012
EE 421G Display Form Course Change ENGINEERING 9/27/2012
EE 462G Display Form Course Change ENGINEERING 9/27/2012
EE 532 Display Form Course New ENGINEERING 10/21/2011
Details of Course/Program ID(EE 532)
WORKITEM ID
Workflow Status
Date
Time
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000010969211 DEPARTMENT APPROVED 2011-12-14 00:00 AM
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000011040728 Received by GC 2012-10-11 12:50 PM
000011040730 Approved by GC 2012-11-15 15:22 PM