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MAY 2 2013

OFFICE OF THE SENATE COUNCIL

1. General Information

1a. Submitted by the College of: ENGINEERING

Date Submitted: 5/6/2013

1b. Department/Division: Civil Engineering

1c. Contact Person

Name: Y. T. Wang

Email: ywang@uky.edu

Phone: 7-5937

Responsible Faculty ID (if different from Contact)

Name:

Email:

Phone:

1d. Requested Effective Date: Semester following approval

1e. Should this course be a UK Core Course? No

2. Designation and Description of Proposed Course

2a. Will this course also be offered through Distance Learning?: No

2b. Prefix and Number: CE 553

2c. Full Title: Environmental Consequences of Energy Production

2d. Transcript Title: Environ Conseq Energy Prod

2e. Cross-listing: EGR 553

2f. Meeting Patterns

LECTURE: 3

2g. Grading System: Letter (A, B, C, etc.)

2h. Number of credit hours: 3

2i. Is this course repeatable for additional credit? No

If Yes: Maximum number of credit hours:

If Yes: Will this course allow multiple registrations during the same semester?

2j. Course Description for Bulletin: This course will introduce the relationship of energy, pollution control technology, and the environment. The scientific and engineering aspects of energy production are examined and the associated environmental problems and control technologies are discussed.

2k. Prerequisites, if any: CHE 105, MA 214, and engineering standing or consent of instructor

2l. Supplementary Teaching Component:

3. Will this course taught off campus? No

If YES, enter the off campus address:

4. Frequency of Course Offering: Fall,

Will the course be offered every year?: Yes

If No, explain:

5. Are facilities and personnel necessary for the proposed new course available?: Yes

If No, explain:

6. What enrollment (per section per semester) may reasonably be expected?: 25

7. Anticipated Student Demand

Will this course serve students primarily within the degree program?: Yes

Will it be of interest to a significant number of students outside the degree pgm?: Yes

If Yes, explain: [var7InterestExplain]

8. Check the category most applicable to this course: Not Yet Found in Many (or Any) Other Universities ,

If No, explain:

9. Course Relationship to Program(s).

a. Is this course part of a proposed new program?: No

If YES, name the proposed new program:

b. Will this course be a new requirement for ANY program?: No

If YES, list affected programs:

10. Information to be Placed on Syllabus.

a. Is the course 400G or 500?: Yes

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: Yes

Distance Learning Form

Instructor Name:

Instructor Email:

Internet/Web-based: No

Interactive Video: No

Hybrid: No

1.How does this course provide for timely and appropriate interaction between students and faculty and among students? Does the course syllabus conform to University Senate Syllabus Guidelines, specifically the Distance Learning Considerations?

2.How do you ensure that the experience for a DL student is comparable to that of a classroom-based student's experience? Aspects to explore: textbooks, course goals, assessment of student learning outcomes, etc.

3.How is the integrity of student work ensured? Please speak to aspects such as password-protected course portals, proctors for exams at interactive video sites; academic offense policy; etc.

4.Will offering this course via DL result in at least 25% or at least 50% (based on total credit hours required for completion) of a degree program being offered via any form of DL, as defined above?

If yes, which percentage, and which program(s)?

5.How are students taking the course via DL assured of equivalent access to student services, similar to that of a student taking the class in a traditional classroom setting?

6.How do course requirements ensure that students make appropriate use of learning resources?

7.Please explain specifically how access is provided to laboratories, facilities, and equipment appropriate to the course or program.

8.How are students informed of procedures for resolving technical complaints? Does the syllabus list the entities available to offer technical help with the delivery and/or receipt of the course, such as the Information Technology Customer Service Center (http://www.uky.edu/UKIT/)?

9.Will the course be delivered via services available through the Distance Learning Program (DLP) and the Academic Technology Group (ATL)? NO

If no, explain how student enrolled in DL courses are able to use the technology employed, as well as how students will be provided with assistance in using said technology.

10.Does the syllabus contain all the required components? NO

11.I, the instructor of record, have read and understood all of the university-level statements regarding DL.

Instructor Name:

SIGNATURE|CEG119|George E Blandford|Dept approval for ZCOURSE_NEW CE 553|20121019

SIGNATURE|BJSTOK0|Barbara J Brandenburg|College approval for ZCOURSE_NEW CE 553|20121019

SIGNATURE|JMETT2|Joanie Ett-Mims|Undergrad Council approval for ZCOURSE_NEW CE 553|20130228

SIGNATURE|ZNNIKO0|Roshan N Nikou|Graduate Council approval for ZCOURSE_NEW CE 553|20130411

SIGNATURE|WF-BATCH|Batch User|Check if cross course approvers exists|20130430

SIGNATURE|CEG119|George E Blandford|CE 553 NEW Dept Review|20130430

SIGNATURE|MONICA|Monica P Mehanna|CE 553 NEW College Review|20130430

e

Courses	Request Tracking

New Course Form

https://myuk.uky.edu/sap/bc/soap/rfc?services=

Open in full window to print or save

Generate R

Attachments:

Browse... Upload File

	ID	Attachment
Delete	1676	CE (EGR) 553 syllabus revised.pdf

First 1 Last

Select saved project to retrieve... Get New

(*denotes required fields)

1. General Information

a. * Submitted by the College of: ENGINEERING Today's Date: 5/6/2013

b. * Department/Division: Civil Engineering

c.

* Contact Person Name: Y. T. Wang Email: ywang@uky.edu Phone: 7-5937

* 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 [1] ◉ No

b. * Prefix and Number: CE 553

c. * Full Title: Environmental Consequences of Energy Production

d. Transcript Title (if full title is more than 40 characters): Environ Conseq Energy Prod

e. To be Cross-Listed [2] with (Prefix and Number): EGR 553

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 will introduce the relationship of energy, pollution control technology, and the environment. The scientific and engineering aspects of energy production are examined and the associated environmental problems and control technologies are discussed.

k. Prerequisites, if any:

CHE 105, MA 214, and 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? 25

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:

Credits earned from this course may be used to satisfy the certification program at the Power and Energy Institute of Kentucky (PEIK) in the College of Engineering.

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) ident additional assignments by the graduate students; and/or (ii) establishment of different grading criteria in the course for graduate students. (See SR

b. ☑ * The syllabus, including course description, student learning outcomes, and grading policies (and 400G-/500-level grading differentiation if appl **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, re 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

CE 553/EGR 553 Environmental Consequences of Energy Production

Fall 2013 TR 11:00 am - 12:15 pm

Location: FPAT 255

Instructor: Dr.Y.T. Wang, Professor, P.E.
365 Raymond Building, Department of Civil Engineering
University of Kentucky, Lexington, KY 40506
Phone: 7-5937, Fax: 7-4404, E-mail: ywang@engr.uky.edu
Web: www.engr.uky.edu/~ywang

Required Text: Energy and the Environment: Scientific and Technological Principles, 2nd ed., J. A. Fay and D. S. Golomb 2012, Oxford University Press, ISBN 978-0-19-976513-3.

Synopsis: This course will introduce the relationship of energy, pollution control technology, and the environment. The scientific and engineering aspects of energy production are examined and the associated environmental problems and control technologies are discussed.

Goal: To provide students with knowledge for understanding, assessing, and control of environmental issues associated with energy production.

Prerequisite: CHE 105, MA 214, and engineering standing or consent of instructor

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

1. Describe energy fundamentals
2. Analyze air pollution and control technologies associated with combustion of fossil fuels.
3. Illustrate water pollution and control technologies associated with combustion of fossil fuels.
4. Describe coal combustion waste management.
5. Discuss the fundamentals of nuclear power production.
6. Describe hazardous waste management and risk assessment associated with energy production.
7. Calculate waste heat from energy production and describe its management.
8. Analyze renewable energy and its impact on environment.
9. Describe global warming and its mitigating approaches.

Topics	Recommended Readings
I. Energy & Environment	Chapter 1
II. Global Energy Use & Supply	Chapter 2
III. Energy fundamentals	S1(pp.21-40)
IV. Fossil-Fueled Power Plant Components	Chapter 6
V. Fossil Fuel Use & Air Pollution	S1(pp.426-470)
VI. Fossil Fuel Use & Water Pollution	S1(pp. 6-9, 231-244)
VII. Coal Combustion Waste Management	S2 (pp.60-71), S3 (ch.8)
VIII. Nuclear Energy & radioactive Waste Management	Chapter 7
IX. Hazardous Waste Management	S1 (pp.333-358,146-162)
X. Waste Heat Management	S2 (pp. 560-575)
XI. Renewable Energy & Environment	Chapter 8
XII. Global Warming & Energy Production	Chapter 11 &12

Supplemental Books

S1. Introduction to Environmental Engineering and Science. 3rd ed., G. M. Master & W. P. Ela,Prentice Hall, Upper Saddle River, NJ 2008. ISBN 0-13-148193-2.
S2. Energy, Technology, and the Environment. P. I-F Liu, ASME, Three Park Ave., New York, 2005. ISBN 0-7918-0222-1.
S3. Surface Water Quality Modeling. S. C. Chapra, McGraw-Hill, 1997. ISBN 0-07-011364-5.

Grading Policy

Grades will be based on the total points accumulated for exams, homework assignments, report, and class participation. The weighting scale is:

Exam I	20%	20%
Exam II	20%	20%
Final Exam	30%	30%
Homework	20%	15%
Presentation	5%	5%
Report	--	5%
Class participation	5%	5%
Total	100%	100%

Reports should be around 10 (20 graduate) double-spaced pages and contain at least 5

(10 graduate) references and are due on the last class before the dead week (November 28, 2013). The report point will be weighted with technical content (40%), writing (30%), and presentation (30%). The subject of report should be approved by the Instructor prior to the deadline. Each student should present his/her report in the class (10 minutes presentation).

There is no makeup on missed/late homework assignments and exams. Makeup will only be given with valid acceptable excuse.

Final grades will be decided from the weighted numerical score according to the following scale:

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

Undergraduate students will be provided with a midterm evaluation of course performance based on the criteria above.

Exams

Exam I: Sept. 24
Exam II: October 17
Final Exam: Dec. 10, 10:30 am – 12:30 pm

All exams are restricted exams with no copies to be made. Possession constitutes cheating. The rules of exam are:

(1) A one-page, one-sided summary of information is allowed but it has to be signed and returned with the exam. It must be a hand written note. Neither cut and paste nor photocopy is allowed.
(2) The calculator must be one that is approved for FE by the NCEES (HP 33s, HP35s, all FX-115, TI-30X and TI-36X models).
(3) Use of a cell phone and any other electronic devices is not allowed.

Homework Policy

Homework assignments will be given on a weekly basis and are due in class before the beginning of class on due day. The assigned work will require manual calculations. Some problems are also to be solved using programs such as MS Excel. Late homework (submitted on due day) will be penalized 20%. Homework submitted after the due day will not be graded.

Class Participation

Class attendance is required and attendance will be taken. Absences will adversely affect the final grade. Forging a classmate's signature to indicate attendance will be considered to be a form of cheating.

Acceptable reasons for excused absences are consistent with university policy, but are typically:

1) serious illness;
2) illness or death of family member;
3) University-related trips;
4) major religious holidays;

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 for adding a class.

All electronic devices brought into the classroom should be turned off during class. A laptop is not needed and it should not be used in class. Any violation of such policy will also adversely affect the final grade.

Field Trip

E.W. Brown Generating Station, September 17th, 11:00 am – 3:00 pm

Student Interaction

Students are expected to maintain communication with the instructor and the TA through personal meetings (by arrangement or during office hours), e-mail or phone. The instructor will normally respond to e-mail or phone calls (received during normal office hours) within four hours of receipt. Students are expected to be familiar with, and have internet access, along with access to software for document creation and editing, and for preparation of presentations. This access is provided at a number of on-campus locations

Disability Statement

Students requiring disability accommodation should provide documentation of the need during the first week of class. The Disability Resource Center (Room 2, Alumni Gym, 257-2754, email address jkarnes@email.uky.edu) specifies the particular type of such accommodations on a student-by-student basis.

Cheating and Plagiarism

University policy on student conduct, including that regarding academic honesty, plagiarism and cheating will be followed. Use of a cell phone without explicit permission during exams or quizzes is not allowed, and will result in a charge of cheating. Student's work should be individual. For a discussion of the overall issue and guidelines, refer to the document on the website of the Ombud of the University of Kentucky at http://www.uky.edu/Ombud/Plagiarism.pdf. The Ombud web site also includes a link to a Prentice Hall Companion Website "Understanding Plagiarism" http://wps.prenhall.com/hss_understand_plagiarism_1/0,6622,427064-,00.html. All exams will be proctored. The minimum penalty for either of these offenses is an "E" for the assignment or examination, with suspension and dismissal also possibilities.

Teaching Assistant

TBA

Email:
Office:
Office hours:

Instructor Office Hour

Normally available 8:00 AM to 3:00 PM or by appointment.

Access to Course Material

Course assignments and lecture notes will be available for download from the instructor's web link: www.engr.uky.edu/~ywang.

Course Schedule

(Tuesday Thursday) 08/22/2013 – 12/05/2013

22-Aug	Thursday	Introduction
27-Aug	Tuesday	Chemistry review, global energy use & supply, HW 1
29-Aug	Thursday	Energy fundamentals: first law of thermodynamics
03-Sep	Tuesday	Energy fundamentals: second law of thermodynamics, HW 2
05-Sep	Thursday	Energy fundamentals: heat transfer and solar radiation
10-Sep	Tuesday	Fossil-fueled power plant components, HW 3
12-Sep	Thursday	Combustion stoichiometry & emission control
17-Sep	Tuesday	**Field trip to E.W. Brown generating station**
19-Sep	Thursday	Air pollution and meteorology, HW 4
24-Sep	Tuesday	**Exam I (HW1-3)**
26-Sep	Thursday	Air quality modeling, **paper topic & abstract due**
01-Oct	Tuesday	Fossil fuel use and air pollution, HW 5
03-Oct	Thursday	Acid mine drainage and hydraulic fracturing
08-Oct	Tuesday	Water quality modeling, HW 6
10-Oct	Thursday	Coal combustion waste management
15-Oct	Tuesday	Nuclear chemistry and radiation, HW 7
17-Oct	Thursday	**Exam II (HW 4-6)**
22-Oct	Tuesday	Nuclear energy fundamental & nuclear reactor components
24-Oct	Thursday	Nuclear fuel cycle, environmental impacts & waste management, HW 8
29-Oct	Tuesday	Hazardous waste management
31-Oct	Thursday	Waste heat disposal, heat balance, HW 9
05-Nov	Tuesday	Temperature modeling
07-Nov	Thursday	Hydropower, biomass, and geothermal energy, HW 10
12-Nov	Tuesday	Solar energy, wind power, tidal, tidal current, and ocean thermal power
14-Nov	Thursday	Global warming and energy production, HW 11
29-Nov	Tuesday	Mitigating global warming
21-Nov	Thursday	**Thanksgiving Day**
26-Nov	Tuesday	Student presentations
28-Nov	Thursday	Student presentations
03-Dec	Tuesday	Student presentations
05-Dec	Thursday	Course review & student course evaluation
10-Dec	Tuesday	**Final Exam 10:30 am – 12:30 pm**