PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

DEPARTMENT: Engineering
EFFECTIVE SESSION: Fall 2010

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:

Subject Abbreviation: ME
Course Number: 42700
Long Title: Sustainable Energy Sources and Systems
Short Title: Sustainable Energy

EXISTING:

Subject Abbreviation:
Course Number:
Long Title:
Short Title:

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED:
Check All That Apply:
- [ ] Summer
- [x] Fall
- [x] Spring

CAMPUS(ES) INVOLVED:
- Calumet
- Cont Ed
- Tech Statewide
- Ft. Wayne
- Indianapolis
- W. Lafayette

CREDIT TYPE

1. Fixed Credit: Cr. Hrs. [ ]
2. Variable Credit Range: [ ] Minimum Cr. Hrs. [ ]
   (Check One) To [ ] Or [ ]
   Maximum Cr. Hrs. [ ]
3. Equivalent Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply:
1. Pass/Not Pass Only
2. Satisfactory/Unsatisfactory Only
3. Repeatable
4. Maximum Repeatable Credit:
5. Credit by Examination
6. Registration Approval Type
   - Department
   - Instructor
7. Variable Title
8. Honors
9. Full Time Privilege
10. Off Campus Experience

Schedule Type:
Lecture: [ ] M-Th 15
Recitation: [ ] T 2
Presentation: [ ]
Lab: [ ]
Clinic: [ ]
Research: [ ]
Ind. Study: [ ]
Pract/Observ: [ ]

Cross-Listed Courses:
- [ ]
- [ ]
- [ ]
- [ ]

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
P: ME 32100, ME 36100 An introduction to energy sources and energy systems with an emphasis on sustainability. Students will apply material from thermodynamics, fluid mechanics, and heat transfer to analyze and design energy systems that utilize non-renewable energy sources such as fossil fuels, nuclear fission & fusion, and hydrogen, as well as renewable energy sources such as solar, wind, biocasts, geothermal, and oceans. Economic, environmental, social, and political issues related to energy are also considered.

* COURSE LEARNING OUTCOMES:
1. evaluate and compare non-renewable and renewable energy sources for energy content and environmental impact.
2. perform thermal, environmental, and economic analyses of energy systems.
3. design energy systems (including economic analysis) and communicate results either orally and/or in writing.
4. understand some of the ethical, economic, environmental, social, and political issues associated with energy and energy systems.

Calumet Department Head
[Signature] 2/29/10
Calumet School Dean
[Signature] 3-17-2010

Fort Wayne Department Head
[Signature]
Fort Wayne School Dean
[Signature]

Indianapolis Department Head
[Signature]
Indianapolis School Dean
[Signature]

North Central Faculty Senate Chair
[Signature]
Vice Chancellor for Academic Affairs
[Signature]

West Lafayette Department Head
[Signature]
West Lafayette College/School Dean
[Signature]
West Lafayette Registrar
[Signature]

OFFICE OF THE REGISTRAR
ME 427 Sustainable Energy Sources and Systems

Pre-reqs: ME 321 and ME 301

Textbook:

References:

Description:
An introduction to energy sources and energy systems with an emphasis on sustainability. Students will apply material from thermodynamics, fluid mechanics, and heat transfer to analyze and design energy systems that utilize non-renewable energy sources such as fossil fuels, nuclear fission & fusion, and hydrogen, as well as renewable energy sources such as solar, wind, biofuels, geothermal, and oceans. Economic, environmental, social, and political issues related to energy are also considered.

Topics:
1. Introduction to Energy and Sustainability
2. Review of Thermal Sciences and Efficiency
3. Environmental Effects of Energy
4. Energy Sources, Systems, and Storage
5. Economic Analysis
6. Fossil Fuels
7. Nuclear Power
8. Hydrogen Fuel Cells
9. Solar Energy
10. Wind Energy
11. Biomass Energy
12. Geothermal Energy
13. Hydropower
14. Ocean Energy (Waves, Tides, and Thermal)

Course Outcomes:
A student who successfully fulfills the course requirements will be able to:

1. evaluate and compare non-renewable and renewable energy sources for energy content and environmental impact. (a, e)
2. perform thermal, environmental, and economic analyses of energy systems. (a, e)
3. design energy systems (including economic analysis) and communicate results either orally and/or in writing. (c, g)
4. understand some of the ethical, economic, environmental, social, and political issues associated with energy and energy systems. (f, h, i, j)

Prepared by: Don Mueller, Ph.D., P.E. (muellerd@ipfw.edu)