

### Request for Graduate Course Addition

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. **The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.**

College: CITE Dept/Division: ES AT&T Alpha Designator/Number: ES670  Graded  CR/NC

Contact Person: Scott Simotnon Phone: 746-2045

**NEW COURSE DATA:**

New Course Title: Sustainable Energy

Alpha Designator/Number: 

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Title Abbreviation: 

S	u	s	t	a	i	a	b	l	e	E	n	e	r	g	y				
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(Limit of 25 characters and spaces)

Course Catalog Description: 

The course focuses on the technological and cost fundamentals of what is generally considered sustainable energy technologies, including solar, wind, biomass and other energy sources.
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(Limit of 30 words)

Co-requisite(s): na First Term to be Offered: Fall 2015

Prerequisite(s): na Credit Hours: 3

Course(s) being deleted in place of this addition (must submit course deletion form): na

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head _____	Date _____
Registrar _____	Date _____
College Curriculum Chair _____	Date _____
Graduate Council Chair _____	Date _____

## Request for Graduate Course Addition - Page 2

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College: CITE

Department/Division: ES AS&T

Alpha Designator/Number: ES670

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Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

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1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

Scott Simonton

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "**Not Applicable**" if not applicable.

Not Applicable

3. REQUIRED COURSE: If this course will be required by another department(s), identify it/them by name. Enter "**Not Applicable**" if not applicable.

Not Applicable

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "**Not Applicable**" if not applicable.

Not Applicable

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "**Not Applicable**" if not applicable.

Not Applicable

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Attached

## Request for Graduate Course Addition - Page 3

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7. COURSE OUTLINE (May be submitted as a separate document)

Attached

8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

Attached

9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

Lecture, discussion, case study evaluation, projects

## Request for Graduate Course Addition - Page 4

10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Discussion questions/homework, projects, midterm and final exams

11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

Not Applicable

12. PROVIDE COMPLETE BIBLIOGRAPHY (May be submitted as a separate document)

Attached

## Request for Graduate Course Addition - Page 5

Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:  
Course Number and Title:  
Catalog Description:  
Prerequisites:  
First Term Offered:  
Credit Hours:

Department: CITE ES AS&T  
Course Number and Title: ES670 Sustainable Energy  
Catalog Description: The course focuses on the technological and cost fundamentals of what is generally considered sustainable energy technologies, incling solar, wind, biomass and other energy sources  
Prerequisites: None  
First Term Offered: Fall 2015  
Credit Hours: 3

## **ES 670 Sustainable Energy**

### **Course Objectives**

This course is designed to increase an environmental science students understanding of the role of energy in modern society, energy demand and its growth, available traditional energy resources and their conversion technologies, sustainable/renewable energy sources and technologies, energy end-uses and conservation issues, and the link between energy consumption and environmental degradation.

### **Outcomes**

#### **Students should:**

A student who successfully completes this course will

1. Understand the desirability of establishing sustainability in the context of energy generation
2. Appreciate the complexity of the problem and the interactions between the various components of the global ecosystem
3. Understand the tradeoffs between environmental impact, resource depletion and economic development
4. Understand the technical basics of each of the major non-renewable and renewable sources of energy.
5. Understand the extent of the environmental impact and resource depletion of each of the major non-renewable and renewable sources of energy.
6. Be able to apply this knowledge in gauging different options for specific scenarios.

**Sustainable Energy  
Course Outline**

		<b>Readings</b>	<b>Assignments</b>
Week 1	Class expectations, introduction, discussion about sustainability, Estimation and Evaluation of Energy Resources	All readings will come from chosen text as well as supplemental readings as appropriate and current	
Week 2	Local, Regional, and Global Environmental Effects of Energy		Discussion Question #1
Week 3	Project Economic Evaluation, Energy Systems and Sustainability Metrics		Discussion Question #2
Week 4	Fossil Fuels and Fossil Energy		Discussion Question #3
Week 5	Nuclear Power		Discussion Question #4
Week 6	Generally on Renewables & Biomass		Project Proposal
Week 7	Geothermal Energy		Mid-term handed out
Week 8	Hydropower		Mid-term due
Week 9	Solar Energy		Discussion Question #5

Week 10	Solar Photovoltaic (PV) Systems		Discussion Question #6
Week 11	Wind Energy		PV Design
Week 12	Ocean Waves, Tide, and Thermal Energy Conversion		
Week 13			Class Presentations
Week 14			Class Presentations
Week 15 Dead week			Final exam distributed

**Sample Text:**

*Sustainable Energy Systems Engineering*, Gevorkian, McGraw-Hill 2007.



## Bibliography

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- Twidell, John, and Tony Weir. *Renewable Energy Resources*. Taylor and Francis, 2005. ISBN: 9780419253303.
- Randolph, John, and Gilbert M. Masters. *Energy for Sustainability: Technology, Planning, Policy*. Island Press, 2008. ISBN: 9781597261036.
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- Lomborg, Bjørn. *Cool It: The Skeptical Environmentalist's Guide to Global Warming*. Vintage, 2010. ISBN: 9780307741103.
- "[Struggling to Hold up a Bank](#)." *The Economist*, August 6, 2009.
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- "[Oil: The Long Goodbye \(An FP Special Report\)](#)." *Foreign Policy*, August 12-17, 2009.
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- "Addressing New Jersey's Climate and Energy Challenges." PSEG, Summer 2007. ([PDF](#))
- Davis, Steven J., Ken Caldeira, and H. Damon Matthews. "[Future CO2 Emissions and Climate Change from Existing Energy Infrastructure](#)." *Science* 329 (September 10, 2010): 1330-1333.
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- "USG Position on the African Development Bank's Investment in ESKOM Medupi Coal Fired Power Project." U.S. Department of Treasury, November 25, 2009. ([PDF](#))
- Bekker, Bernard, et al. "[South Africa's Rapid Electrification Programme: Policy, Institutional, Planning, Financing, and Technical Innovations](#)." *Energy Policy* 36 (2008): 3125-3137.
- Wroughton, Lesley. "[Global Climate Battle Plays Out in World Bank](#)." *Reuters*, March 7, 2010.