

CES 850 - Teaching Undergraduate Engineering

Second Summer Session 2007 (July 6 - August 8)

Time: Monday/Wednesday/Friday, 10:00 - 1:00

Location: 107 Holtzendorff Hall, unless otherwise noted

Instructors: Dr. Lisa C. Benson, Ph.D.

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Dr. Beth Stephan, Ph.D.

Director, General Engineering Program
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Office Hours: By appointment

COURSE OBJECTIVES:

This 3 credit course is designed for graduate students who are seeking a future career in academe. Upon completion of this course, students will be able to:

- Describe the attributes of effective teaching, and identify specific qualities needed for teaching engineering
- Identify the skills that engineering students need to develop in order to prepare them for successful careers
- Identify characteristics of "Millennials," and apply them to effectively teach this generation of engineering students
- Identify different learning styles, and design learning activities that address them
- Define learning objectives, classify them in terms of Bloom's Taxonomy, and formulate them for relevant courses in their own disciplines
- Identify different teaching techniques such as cooperative learning and problem-based learning, and how they are used for effective teaching
- Create assessment tools (problems, exercises and tests) that accurately measure their students' learning
- Evaluate the usefulness of technology for enhancing teaching
- Interpret current trends and literature in engineering education
- Design lesson plans and learning activities for use in an undergraduate course in their own engineering disciplines

CLASS POLICY:

Academic Integrity

Integrity without knowledge is weak and useless, and knowledge without integrity is dangerous and dreadful.

– Samuel Johnson, English writer and lexicographer (1709-1784)

“As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a ‘high seminary of learning.’ Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.”

The Honor Code for the College of Engineering and Science/Clemson University will be applied for projects, reports and exams.

http://www.ces.clemson.edu/main/students/honor_code.htm

Attendance

If classes or project sessions must be missed for extra-curricular activities, illness, or other reasons, the instructor must be informed prior to absence if possible or upon return. Unexcused absences and/or tardiness may detrimentally influence grades.

Course Grading

Written assignments (40%)

Oral presentations (20%)

Class participation (20%)

Final Project (20%)

A= 90 - 100; B = 80-89; C = 70 - 79; D = 60 - 69; F = 68 or below

COURSE OUTLINE:

Date	Topic	Assignments and Readings Due*
7/6	Best Practices in Engineering Education: An Overview	Read "The Heroic Engineer" prior to first class
7/9	Education Frameworks: General Education and ABET First Year Engineering Programs Lunch Guest: Ben Sill	Assigned Readings; List strengths and weaknesses of General Education requirements assignment
7/11	Understanding Millennials Lunch: Millennials in the Movies	Assigned Readings; General Engineering Objectives assignment
7/13	Personality Types and Learning Styles Lunch: Math Skills Article Critiques	Assigned Reading; Complete personality profile and Index of Learning Styles online
7/16	Teaching Environments Lunch: Review Engineer Interviews	Optional Reading; Podcast Interview with an engineer
7/18	Teaching to How the Mind Works (Guest Lecturer: Linda Nilson)	Assigned Reading
7/20	Syllabus and Course Planning <i>Lunch: Student presentations of article reviews</i>	Review of a selected article about engineering education
7/23	Active Learning Lunch: Active Learning in Practice	Assigned Reading; Syllabus assignment
7/25	Cooperative and Problem-Based Learning Lunch:	Assigned Readings
7/27	Assessment Lunch Guest: Doug Hirt	Assigned Readings; Active learning assignment
7/30	<i>Work session: Teaching Modules</i> Lunch Guest: David Moyle	Draft of teaching module
8/1	Technology for Teaching (Guest Lecturer: Barbara Weaver) Lunch Guest: Melanie Cooper	Assigned Readings
8/3	<i>Book reviews</i>	Review paper #2 (book review)
8/6	Upper Level Classes (Capstone and Design); Undergraduate Research Lunch Guest: Scott Husson	Assigned Readings
8/8	<i>Student Presentations: Teaching modules</i>	Teaching module

*See assignments and readings posted on Blackboard

REQUIRED TEXT: none

RECOMMENDED RESOURCES:

Teaching At Its Best, Linda Nilson, Anker Publishing Co, Inc, 2003;

A full list of scholarly articles and books is available under course information on Blackboard.

Updated 8/6/2007