

ESG 440 CAPSTONE ENGINEERING DESIGN I (REQUIRED)**Credit: 4****COURSE CATALOG DESCRIPTION:**

Lectures by faculty members and visitors on typical design problems encountered in engineering practice. During this semester each student chooses a senior design project. A preliminary design report is required.

PRE- OR COREQUISITE(S): ESG 316 Engineering Science Design II: Methods; ESG major; U4 standing; Permission of the department

TEXT(S) OR OTHER REQUIRED MATERIAL: None

COURSE LEARNING OUTCOMES	SOS	ASSESSMENT TOOLS
Conception and design of a new product or product improvement	a, b, c, d, e,	Evaluate final written report
Development of research skills to determine prior art via intellectual property and literature searches	h, i, j	Evaluate research paper
Appreciation for the use of design of experiments in research and manufacturing	h, k	Homework assignment
Learning time management and budgeting skills for the design project	h, i, j, k	Evaluate written report and oral presentation
Using computer-aided drawings to illustrate designs and provide details for machining of components	a, c, d, h, k	Evaluate written report and oral presentation
Using materials selection in design	h	Homework assignment
Discussion of ethical issues in engineering to make students aware of possible scenarios they could encounter in the work force	f	Mock FE exam taken in ESG 375
Development of team-work skills	d	Peer evaluations
Development of written and oral communication skills	g	Evaluate written reports, oral presentation, and poster presentation

COURSE TOPICS:

- Engineering design concepts
- Idea generation – brain storming
- Intellectual property
- Design of experiments
- Materials selection
- Computer-aided design
- Time management
- Cost-benefit analyses
- Ethics in engineering

CLASS/ LABORATORY SCHEDULE:

ESG	440	Engineering Science Design III	LEC	1	M	5:20 PM	8:10 PM
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CURRICULUM

This course contributes 3 credit hours toward meeting the required 48 hours of engineering topics culminating in a major design experience.

STUDENT OUTCOMES (SCALE 1-3):

A	B	C	D	E	F	G	H	I	J	K
3	2	2	2	2	2	2	2	2	2	2

3 – Strongly supported

2 – Supported

1-Minimally supported

LEAD COORDINATOR(S) WHO PREPARED THIS DESCRIPTION AND DATE OF PREPARATION:

Christopher M. Weyant 5/15/2010