

ESG 316 ENGINEERING DESIGN METHODS (REQUIRED)

Credit: 4

COURSE CATALOG DESCRIPTION:

Design and design- planning methods are developed from the conceptual stages through the application stages using lecture and laboratory. Includes synthesis, optimization, modeling, and simulation and systems engineering. Case studies illustrate the design process. Students undertake a number of drawing projects employing various design tools. Laboratory fee required.

PRE- OR COREQUISITE(S): ESG major; U2 standing or higher, ESG100; AMS 161 or MAT 127 or MAT 132 or MAT 142

TEXT(S) OR OTHER REQUIRED MATERIAL: None

COURSE LEARNING OUTCOMES	SOS	ASSESSMENT TOOLS
Teach the student the tools needed to be proficient in engineering design software “Solid Works” and give a broad perspective on what good engineering design entails	E,k	Homework and paper assignments Lab CAD drawings Midterm drawing exam
Show the students the multiple steps of engineering design from object concept to implementation through hands-on approach.	a,c,gk	Final design project with design constraints

COURSE TOPICS:

Weeks 1-2. Review of design, fundamentals; statistical process control, Introduction to computer accounts, setup (week 2)

Weeks 2-7. Introduction to mechanical drawing via paper/pencil and CAD

Weeks 7-8. Materials selection,

Weeks 8-9. Further topics in engineering economics, Using AutoCAD to multiple views

Weeks 9-10. Optimization, Three dimensional representation in AutoCAD; modeling, rendering, mesh

Weeks 11-12. Fabrication techniques, machining, welding, NDT

Weeks 12-13. Begin work on design drawings for final project

Weeks 14-15. Communication in engineering, Final project drawings; rapid prototyping for final presentation

CLASS/ LABORATORY SCHEDULE:

ESG	316	Engrng Sci Design II: Methods	LEC	1	TUTH	6:50 PM	8:10 PM
			REC	R01	RECW	3:50 PM	4:45 PM
			LAB	L01	W	5:20 PM	8:20 PM
			REC	R02	RECM	3:50 PM	4:45 PM
			LAB	L02	M	5:20 PM	8:20 PM

CURRICULUM

This course contributes 4 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
2		2		3		3				3

3 – Strongly supported

2 – Supported

1- Minimally supported

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

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