



# Mechanical Engineering Dept. Department

## Syllabus

### ME 485: Mechanical System Design (3-0-3)

#### Course Catalog Description:

Mechanical systems: definition and classification; the engineering design process; Need, identification and problem definition; Concept generation and evaluation; Embodiment design. Modeling and simulation; Materials selection and materials in design; Materials processing and design; Design for X. Risk, reliability and safety; Robust and quality design; Economic decision making; Cost evaluation; Legal and ethical issues in design; Detail design; Case studies; Projects.

#### Course Pre-requisites:

- ME 307: Machine Design I

#### Course Objectives:

1. Able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics and any new knowledge acquired as needed.
2. able to design diverse systems including manufacturing, service, logistics, financial and information, to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
3. able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
4. able to communicate the implemented design ideas by writing technical reports and making oral presentations.

#### Course Learning Outcomes:

CLO1. Able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics and any new knowledge acquired as needed

CLO2. Able to design diverse systems including manufacturing, service, logistics, financial and information, to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

CLO3. Able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives

CLO4. Able to communicate the implemented design ideas by writing technical reports and making oral presentations.

## Learning Resources:

- Engineering Design 5th Edition, by George Dieter, Linda Schmidt, Mc Graw Hill, 2012.

## Lecture Assessment Plan:

Assessment Task	Week Due	Weight
Project	15	40.0%
HW, Quiz	3,5,8,12,14	10.0%
Exam	7,15	50.0%

## Lecture Weekly Schedule:

Week#	Topics
1	Mechanical systems: definition and classification; the engineering design process;
2	Need, identification and problem definition;
3	Team behavior and tools
4	Gathering information for design
5	Concept generation and evaluation;
6	Embodiment design.
7	Modeling and simulation;
8	Materials selection and materials in design;
9	Materials processing and design
10	Design for X
11	Risk, reliability and safety
12	Robust and quality design
13	Cost evaluation
14	Legal and ethical issues in design
15	. Detailed design