Course Description:
Design and performance of machine components and systems subjected to both steady and variable loading conditions. Failure theories, reliability, use of codes and standards, and standard design practices are introduced. Also discussed are realistic constraints for design in economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability context. 3 hours lecture, 2 hours activity. MECH 340 is an approved major course substitution for either Individual & Society (D1) or Societal Institutions (D2). You must complete one additional D1 or D2 course.

Students must pass this class with a C- or better to be allowed into MECA/MECH 440A


Office: OCNL 418, 898-6353. Please consult my door card for office hours.

Class:
Lecture: PLMS 205 MWF 11:00-11:50 a.m.
Activity: PLMS 205 M 2:00 – 3:50 p.m.

Prerequisites:
CIVL 311 with a grade of C- or higher, MECH 100, MECH 100L, MECH 140, MECH 210, SMFG 160. Recommended: MECH 320.

Course Objectives:
1. To understand the design process.
2. To understand, and apply the failure theories to designing components.
3. To design a semester-long application

Coverage includes the following topics:
1. Introduction to Design
2. Materials and Processes
3. Loading
4. Stress, Strain, and Deflection
5. Failure Theories (Static, Fatigue, and Surface)
6. Component Design (Load Analysis, Beams, Keys, Shafts, Couplings, Fasteners, Impact, Clutch & Brakes, Gears, Springs)

Grading Policy
5% of Homework
40% of Design Project
55% of Exams
Grading: | Range (- to +) |
---|---|
A: | 90 – 100% |
B: | 75 - 89% |
C: | 60 - 74% |
D: | 50 - 59% |
F | 0-49% |

**Note:** Late work will not be accepted.

1. Home work will be graded and returned to you in time to study for the exams. However, some homework does not get picked up by students. That starts piling up in my office. The week prior to the finals week is the last week to pick up ALL your graded home work. Thereafter it will be shredded.

2. Once exams are graded and their solutions discussed in class, they must be returned to the instructor. You may bring any grading errors to the instructor and your grade will be rectified. No one will be allowed to keep their exams. Once the following academic semester (summer session is not an academic semester) has started, you have 31 days from the start of that semester to get questions about your overall grade as well as questions about the grade on the final exam clarified from the previous semester. All exams will be shredded after that.

**Homework:**
Homework is due at the beginning of class.

**Exams:**
There will be in-class exams. Each successive exam may include prior course material. Exam dates will be announced in class along with your responsibility. Examinations are used to assess basic competency in a certain area of the course. All the competency assessments in the course are summarized later in the syllabus.

**Design Project:**
In a design project one has the opportunity to integrate course material to potentially design an actual product. The design project must be completed to be graded. More complex the design project, higher will be its value. An appropriate gradingrubric will be provided. Late projects will receive a lower grade. The design project is used to assess basic competency in certain areas of the course. All the competency assessments in the course are summarized later in the syllabus.

**Plagiarism:**
Copying is plagiarism and will not be tolerated. Such incidences are referred to the student judicial affairs and may result in expulsion from the University. Refer to Students Rights and Responsibilities section of the University Catalog, or ask the student judicial affairs about a specific situation.

**Reference:**
*Mechanical Engineering Design*
Many useful URLs are available at the end of most chapters. For example:

1. http://www.machinedesign.com

Mechanical Engineering Design MECH 340 Competencies Assessment Summary:

The design competencies of all the Mechanical and Mechatronic Engineering Program will be assessed in a set of program learning outcomes. These program outcomes are listed in the University Catalog and on the Department of Mechanical and Mechatronic Engineering, and Sustainable Manufacturing website at http://www.ecst.csuchico.edu/__depts/mem/BS_Mechanical_Engineering/Educational_Objectives.html

This course assesses four basic competencies in the following program outcomes a, c1, g2, and g3. These outcomes are stated below along with how they are assessed to demonstrate basic competency.

a “An ability to apply knowledge of mathematics, science, and engineering”

This competency is demonstrated by receiving a C-, i.e. 60% of the exam total.

The design project is used to assess basic competency in the following program outcomes:

   c1   “An ability to design a mechanical system, component, or process to meet desired needs”

   g2   “An ability to communicate technical matters effectively in written form”

   g3   “An ability to communicate technical matters effectively in graphical form”

To demonstrate basic competency in the design project one must receive:

1. a grade of C i.e. 65% of the Technical Aspects of the design project.
2. a grade of C i.e. 65% of the Written Summary Report of the design project.
3. a grade of C i.e. 65% of the Graphical communication of selected parts of the design project.

Americans with Disabilities Act: If you need course adaptations or accommodations because of a disability or chronic illness, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Please also contact Accessibility Resource Center (ARC) as they are the designated department responsible for approving and coordinating reasonable accommodations and services for students with disabilities. ARC will help you understand your rights and responsibilities under the Americans with Disabilities Act and provide you further assistance with requesting and arranging accommodations. Accessibility Resource Center 530-898-5959 located in Student Services Center 170, arcdept@csuchico.edu.