EML 4500 - MACHINE DESIGN
Common Course Syllabus

Catalog Data: 3 CREDITS. Introduction to machine design; fundamental principles in strength of materials; static and fatigue failure theories; design of machine elements; and design projects.

Prerequisites: EGM 4523C – Intermediate Strength of Materials

Co-requisites: EML 4730L ME Laboratory

Goals: This course will integrate the knowledge of Statics, Dynamics, Strength of Materials and Engineering Materials into the design process of machine elements. Students will learn the fundamentals of the design process, and the design of some common machine elements will be the focus. The students will apply the concepts in the design of a simple machine.

Topics:
1. Introduction to machine design
2. Fatigue failure theories
3. Design of shafts and keys
4. Design synthesis and analysis of linkages
5. Analysis of different gear trains
6. Force balancing

Course Outcomes: (numbers in parentheses indicate correlation of the outcome with the appropriate ABET program outcomes 1-7)
1. The student will learn the concepts of fatigue failure theory and apply them in machine design. (1,2,6)
2. The student will be able to use the knowledge in Statics and Strength of Materials for design of machine elements, such as shafts, keys, bearings, screws and fasteners. (1,2,6)
3. The student will be able to perform synthesis and analysis of basic 4-bar and 6-bar linkages. (1,2,6)
4. The student will be able to analyze different gear trains. (1,2,6)
5. The student will be able to perform balancing for simple mechanisms or machinery. (1,2,6)
6. The student will be able to communicate effectively through written and oral skills. (3)

Design Content:
This course has design content of 1 credit. 33% of the final grade will be determined from design projects.

Updated 2/19