"Find the gift God gave you. Sharpen, hone, and train it. And, then go use it. Go!"
-Donald P. Shiley '51

Course Description: Theoretical and practical aspects of the design of various machine components and simple systems. The design criteria are based on stress analysis, manufacturing issues, materials, and fatigue considerations. A modest sized machine design project is required.

Number of Credits: 4

Class Schedule: MWF 9:15-10:10; M 11:25-12:20

Course Instructor: Kenneth E. Lulay, Ph.D., P.E.
Shiley Hall 236. Ph: 943-7432. e-mail: lulay@up.edu
Web pages: http://faculty.up.edu/lulay/

Office Hours: Available any time if I’m in my office. I’ll try to be in my office:
Monday 12:30-1:00
Tuesday 9:45-11:30
Wednesday 1:00-2:00
Thursday 9:45-10:30
Friday 11:30-12:00

Prerequisites: EGR221, EGR322

Textbook: Budynas, R. G. and J. K. Nisbett, Shigley’s Mechanical Engineering Design, or others (see course web).

Additional texts: Basic materials science and strength of materials and other texts may be necessary for projects and homework. Library has such books.

Course Objectives: There are several objectives for this course. Students shall demonstrate the ability to:

Design a device to meet desired needs with multiple constraints:
  - Plan, organize, and conduct a modest sized machine design project
  - Clearly define design criteria, and conceive and evaluate designs based on qualitative and quantitative factors.

Function on a team with various roles.

Formulate and solve machine design problems by analyzing machine components with consideration to various service conditions (static, fatigue, impact, corrosion, etc.).

Understand basic design considerations for components such as bearings, gears, and brakes.

Communicate effectively:
  - Learn to document engineering work using Design Decision Documents.
  - Create a project plan
Write a final design document.

Assignments: All assignments must follow the standard Mechanical Engineering problem solving format (Given, Find, Assumptions, etc.).

E-mail: Students are required to check their UP email accounts daily.

Policy on Late Assignments: All assignments are due at the beginning of class! Special circumstances may allow for exemptions. Discuss with instructor.

Policy on Exams: No makeup exams will be given. If you cannot attend an exam for a legitimate reason, please contact the instructor to arrange to take the exam in advance. Upon receiving your graded exam, you have the right to question the grading of your exam. You must provide a typed page addressing the specific issue in question and present this page along with your original exam to the instructor. You have one week from the day your exam is returned to question any grading errors.

Topics Covered:

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Grading: Six midterm exams 55%*  
Final Examination 20%*  
Team Project 10%  
Homework 15%  
Total: 100%

Note, historically, the final exam is a tough thing to score high on.  
*The mid-terms are worth 10% each. The worst exam score (final or midterm) will be weighted less. If the worst score is a mid-term exam, it will be worth 5%, if the final is the worst score it will be worth 15%.

Students with an average midterm exam score of 93% or higher do not need to take the final exam, they will automatically receive 100% for the final. The scores from the above distributions will be combined into a letter grade according to the following scale:

- Better than 90%: A: Excellent performance
- Better than 80%: B: Very good performance
- Better than 70%: C: Acceptable performance
- Better than 60%: D: Poor performance
- 0%-60%: F: Unacceptable performance
UNIVERSITY-WIDE POLICIES:

Assessment Disclosure Statement: Student work from this course may be used by the University for educational quality assurance purposes.

University of Portland’s Code of Academic Integrity: Academic integrity is openness and honesty in all scholarship endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. The University’s Code and guidelines of Academic Integrity is available on the web (www.up.edu > Academics > Registrar > Academic Regulations). The complete Code may be found in the University of Portland Student Handbook as well as the Guidelines for Implementation. Students should read and be familiar with the code and guidelines and should be aware of the various types of violations; cheating, forgery, and plagiarism. In this course, all violations will be considered as being of Level 2 or higher. In the classroom and in your interactions with other students, faculty and advisors, you are expected to conduct yourself in a professional and courteous manner.

Accommodation for Disability: If you have a disability and require an accommodation to fully participate in this class, contact the Office for Students with Disabilities (OSWD), located in the University Health Center (503-943-7134), as soon as possible.

Vehicle Policy: If you plan to drive as part of the course, you should read the University Vehicle and Transportation Policy for Students. The policy is available on the Public Safety website. The policy requires drivers of private or University vehicles to attend a one-time safe driving course and to submit a trip itinerary for every off-campus trip. Your attendance at the on-time driving course can be arranged through Public Safety. The itinerary form can be obtained from the Public Safety. The itinerary must be signed by your faculty advisor.

Shop and Laboratory Use: In order to use or work in the shops or labs, training from the shop technician and instructor permission is required.