MET 250 Machine Design

Course Description: A course on applying the principles of engineering mechanics and strength of materials to the analysis and selection of mechanical components. Topics include: combined stresses, failure theories, shaft components, shaft design, and fasteners.

Prerequisites(s): MET 150 **Corequisite(s):** No corequisite

Lecture Hours: 3	Lab Hours: 3	Credit Hours: 4
Lab Fee: 105	Supplemental Fee: 0	Purpose:
☐ Transfer Assurance Guide Course (TAG)	☐ Transfer Module Course (TM)	
Course Format: Lec/Lab	Grading: A/B/C/D/F/I	
Delivery Method: □ Web	□ Hybrid	x Classroom
Semesters Offered: x Fall	x Spring	Summer

Course Primary Text:

Title: Machine Elements in Mechanical Design	Edition: 5th
Author(s): Robert L Mott	
Publisher: Prentice Hall	

Supplemental Materials:

None

Course Outcomes:

1	The student will be able to apply knowledge, techniques, skills and modern tools of the discipline to analyze and solve design problems.
2	The student will have the ability to identify, analyze, and solve narrowly defined engineering technology problems
3	The student has the ability to apply written, oral, and graphical communication in both technical and non-technical environments; an ability to identify and use appropriate technical literature
4	The student has an understanding of the need for, and an ability to engage in self-directed continuing professional development
5	The student has an understanding of and a commitment to address professional and ethical responsibilities, including a respect for diversity
6	The student will demonstrate a commitment to quality, timeliness, and continuous improvement

Course Topics:

Week 1	Review of the topics from Statics and Strengths of Materials, and an introduction to material selection based on mechanical properties as listed in the appendix.
Week 2	Combined stresses and Mohr's circle analysis.
Week 3	Designing for cyclic loads. Topics of endurance strength and various method of failure prediction are covered.
Week 4	Long and short columns analysis.
Week 5	Belt and chain drive analysis.
Week 6	Kinematics of gears.
Week 7	Spur gear design and selection.
Week 8	Helical, bevel and wormgear design and selection.
Week 9	Keys, couplings and seals design and selection. Tolerances and fits.
Week 10	Shaft design.
Week 11	Roller contact bearings.
Week 12	Plain surface bearings
Week 13	Linear motion elements and fasteners.
Week 14	Spring design and properties.
Week 15	Machine frame design and an overview of motion control: clutches and brakes.

Methods of Evaluation/Assessment

□ Formative: □ Summative

List assessment activities (e.g. quizzes, discussions, essays, research papers, debates, oral presentations, exams):

Quizzes will be given which assess the students grasp of concepts covered in lecture and assigned homework.
Exams will be used to determine the student's depth of knowledge over material covered in lecture, homework assignments and quizzes.
Each student will design a shaft used for power transmission based on information provided by their instructor. The student will created a report which details each step in their design which must be supported by calculation. Complete specifications, including material, tolerances and any heat treatment must be included with their final shaft drawing.

Course Keeper: Abbey Yee Date Completed: 8/11/18