

1. MEEG304 MACHINE DESIGN - ELEMENTS

2. Credits 3 Contact Hours 3

3. Spring 2017 James Glancey, Ph.D.; Spencer Lab

**4. Textbook Shigley's Mechanical Engineering Design, 9th Edition Authors:
Budynas & Nisbett, ISBN- 0073121932**

5. Specific course information

- a. Catalog Description:** Aspects of machine design: statistical nature, theories of failure and design for strength and design of machine elements.
- b. Prerequisite:** MEEG301 and C- or better in MEEG215 or CIEG212.
COREQ: MEEG202.
- c. Course is required.**

6. Specific goals for the course

- a. Specific Outcomes of Instruction:** This course presents basic tools, elements and approaches to mechanical systems design. Instruction will cover: 1) Mechanics and Failure of Materials, 2) Design and Analysis of Machine Elements and Mechanical Assemblies. Students will have opportunities to apply the course content to general engineering analysis problems and to open-ended design project sponsored by local engineering businesses and potential customers.
- b. Student Outcomes Addressed:**
Although this course could be asked to cover all the outcomes except Outcome b (an ability to design and conduct experiments, as well as to analyze and interpret data), for 2016-2017 the outcome aligned with this course is Outcome f: an understanding of professional and ethical responsibility - particularly focusing on the ethical responsibility.

7. Brief list of topics to be covered

By the end of this course, each student will have demonstrated the abilities to:

- Define (mechanical) failure,
- Select and apply an appropriate failure model,
- Select and design an appropriate machine element
- Determine allowable load (under the given operating conditions)
- Determine element life,
- Design and analyze assemblies and subassemblies of multiple elements
- Function within an interdisciplinary team to complete large projects
- Communicate effectively
- Use engineering tools appropriately
- Understand and apply the ethical responsibilities of design engineering.