

**DEPARTMENT OF MECHANICAL ENGINEERING
FALL 2005 - ME 314 MACHINE COMPONENT DESIGN
MWF 12:20 P.M. - 1:10 P.M.**

INSTRUCTOR:

Dr. Jan Gou

Office hours: MW, 9:00 - 11:00 a.m., F, 9:00-10:00 a.m., also by appointment

PREREQUISITE:

EG 284 Dynamics

EG 315 Mechanics of Materials

ME 123 Introduction to Design and Ethics

TEXTBOOK

Fundamentals of Machine Component Design, by R. C. Juvinall and K. M. Marshek, 3th Edition, John Wiley & Sons

COURSE CONTENT

Analysis and optimization of machine elements to accomplish given tasks within limits of stress and size. One hour of design.

COURSE GOALS

1. Formulate methods of analysis and apply these methods to obtain: stresses, strains, deflections, and column stability. In addition, static and fatigue theories are applied and lead to safety factor considerations. Outcome Measures and Assessment - Homework assignment and exam.
2. Analyze and synthesize methods to design the following machine components: screwed connections, welded connections, sliding bearings, rolling bearings, spur, helical, bevel, worm gears, shafts, clutches and brakes. Outcome Measures and Assessment - Homework, design assignments and exam.
3. Students demonstrate the use of the design process to open-ended problems, at least one problem on the final exam meets design criteria.

TOPICS COVERED

Load Analysis

Static Body Stresses

Elastic Strain, Deflection, and Stability

Failure Theory, Safety Factor, and Reliability

Fatigue

Threaded and Fasteners and Power Screws

Rivets, Welding, and Bonding

Lubrication and Sliding Bearings

Rolling-Element Bearings

Spur Gears

Helical, Bevel, and Worm Gears

Shafts and Associate Parts

Clutches and Brakes

GRADING POLICY

Class Attendance	10%
Homework	35%
Project	15%
Term Exams	20%
Final Exam	20%
Total	100%

COURSE GRADE: A (90-100); B (80-89); C (70-79); D (60-69); F (< 60)

FINAL EXAM: 1:00 p.m.- 3:00 p.m., Friday, December 9, 2005

CLASSROOM POLICY

1. Homework assignments will be announced in class and they are due at the beginning of the class period on the due day. If homework assignments are late, points will be deducted. Each day an assignment is late 10% will be taken off.
2. Students will be divided into several groups. The project assignments include Solutions 40%, Results and Discussions 20%, Style (grammar, organization) 15%, and Presentation 20%. If project assignments are late, points will be deducted. Each day an assignment is late 10% will be taken off.
3. There will be two exams plus a comprehensive final exam. Sketches and all solutions must be shown clearly and neatly in your exam papers. All examinations missed due to illness or emergency require a written, verified excuse or a grade of zero will be assigned.
4. Class attendance is necessary for satisfactory performance. It is student's responsibility to find out about all the assignments and announcements made in class. The student is held responsible for all missed work and classroom information. Class roll will be taken at the beginning of the term to ensure that students are attending the correct class. Class rolls will not be taken each time, but may be taken at any time to identify absentees.
5. Cheating and plagiarism are serious academic matters and they will be handled by the following policy and by the University policy. A grade of zero is assigned for the entire assignment. For example, zero is assigned for the entire test and not for individual parts of the test. Automatic failure of the course can result from a zero grade on an individual assignment. The case will be reported to the Dean of Students for disciplinary action.
6. In accordance with Americans Disabilities Act, students with bona fide disabilities will be afforded reasonable accommodation. The office of Special Student Services will certify a disability and advise faculty members of reasonable accommodations. If you have a specific disability that qualifies you for academic accommodations, please notify your instructor and provide certification from Disability Services (Office of Special Students Services). The Office of Special student Services is directed by Ms. Bernita Pulmas and is located in the Student Center, Room 270, Phone 460-7212.

ME 314 MACHINE COMPONENT DESIGN - FALL 2005
Dr. JAN GOU

	DATE			READING ASSIGNMENT	PROBLEMS
1	Mon	22		Introduction	To be announced in class
2	Wed	24	August	Chapter 2	
3	Fri	26		Chapter 2	
	Mon	29			
	Wed	31			
	Fri	2	September		
	Mon	5		Labor Day Holiday	
4	Wed	7		Chapter 4	
5	Fri	9		Chapter 4	
6	Mon	12		Chapter 4	
7	Wed	14		Chapter 5	
8	Fri	16		Chapter 5	
9	Mon	19		Chapter 6	
10	Wed	21		Chapter 6	
11	Fri	23		Chapter 6/8	
12	Mon	26		Chapter 8	
13	Wed	28		Chapter 8	
14	Fri	30		Review	
15	Mon	3	October	TEST 1	
16	Wed	5		Chapter 10	
17	Fri	7		Chapter 10	
18	Mon	10		Chapter 10	
19	Wed	12		Chapter 10	
20	Fri	14		Chapter 10	
21	Mon	17		Chapter 10/11	
22	Wed	19		Chapter 11	
23	Fri	21		Chapter 13	
24	Mon	24		Chapter 13	
25	Wed	26		Chapter 13/14	
26	Fri	28		Chapter 14/Review	
27	Mon	31		TEST 2	
28	Wed	2	November	Chapter 15	
29	Fri	4		Chapter 15	
30	Mon	7		Chapter 15	
31	Wed	9		Chapter 15	
32	Fri	11		Chapter 15	
33	Mon	14		Chapter 16	
34	Wed	16		Chapter 16	
35	Fri	18		Chapter 16	
36	Mon	21		Chapter 16	
	Wed	23		Thanksgiving Holiday	
	Fri	25		Thanksgiving Holiday	
37	Mon	28		Chapter 16	
38	Wed	30		Chapter 17	
39	Fri	2	December	Chapter 17	
40	Mon	5		Project Presentation	
41	Wed	7		Chapter 18	
42	Fri	9		Chapter 18	
43	Mon	12		Review	

EXAM: 1:00 p.m.- 3:00 p.m., Thursday, December 15, 2005

TEXT: Fundamentals of Machine Component Design, 3rd Edition, John Wiley & Sons