Sample Syllabus

Penn State University
Department of Mechanical Engineering

ME 360– MECHANICAL DESIGN, Section 1

Prerequisites or Concurrent: (CMPSC 200 or CMPSC 201) and EMCH 213. Please review your notes from these courses.

Text: Shigley's Mechanical Engineering Design, 11th Edition, by Richard Budynas and Keith Nisbett.

Time & Place: M W F 9:05 AM – 9:55 AM; Zoom link is given below:
https://psu.zoom.us/j/98951466720?pwd=V01HMmoyRFZOeEtaMUdadURRQk5HZz09
Password: 150373

Instructor: Professor Aman Haque, 317A Leonhard Bldg., Tel: 865-4248, Email: mah37@psu.edu

Office Hours: Wednesday 2 pm – 5 pm, or by appointment. Zoom link is given below:
https://psu.zoom.us/j/96012765095?pwd=U2syankwYUFBc3JpdFVjZCtNREhXUT09
Password: 365448

Teaching Assistant: Dahae Jeong, Email: dhjeong@psu.edu (Office hours: Thursday 8-11 am, Zoom link is given below:
https://psu.zoom.us/j/95657276327?pwd=REo0S0VJcXVMWjJmNmRIT1doSW5DUT09)

Teaching Assistant: Shabnam Rahimnezhad, Email: spr5679@psu.edu (Office hours: Tuesday 8-11am, Zoom link: https://psu.zoom.us/j/9247184455)

Course Objectives & Outcomes: Upon completion of this course, students should be able to:

1. Apply concepts and methods learned in Statics, Strengths of Materials and Engineering Materials to the analysis and design of mechanical components.
2. Perform fatigue and yielding failure predictions for structural mechanical elements that can be used for design.
3. Analyze and specify different mechanical components such as gears, fluid film bearing, rolling element bearings, screws, pulleys and springs.
4. Make basic design decisions regarding the suitability of different materials in mechanical components, e.g. steel vs. aluminum.
5. Make basic design decisions regarding the suitability of different components in a mechanical system, e.g. ball bearings vs. fluid film bearings.
6. Demonstrate professionalism in interactions with colleagues, faculty, and staff.
7. Understand the origin and nature of ethical issues in engineering design and practice.

Tentative Class Schedule

Week		Date	Topic	Out	Due
1	M	1/18	Dr. Martin Luther King Day - No Classes		HW 0
	W	1/20	Introduction/overview {introduce yourself in <30 secs}		
	F	1/22	Chapter 2: Materials & Chapter 3: Load and stress analysis	HW 1	
2	M	1/25	Chapter 3: Load and stress analysis		
	W	1/27	Chapter 5: Static Failure		
	F	1/29	Chapter 5: Static Failure	HW 2	HW 1
3	M	2/1	Chapter 5: Static Failure		
	W	2/3	Chapter 5: Static Failure		
	F	2/5	Chapter 5: Static Failure	HW 3	HW 2
4	M	2/8	Chapter 6: Fatigue Failure		
	W	2/10	Chapter 6: Fatigue Failure		
	F	2/12	Chapter 6: Fatigue Failure	HW 4	HW 3
5	M	2/15	Chapter 6: Fatigue Failure		
	W	2/17	Chapter 6: Fatigue Failure		
	F	2/19	Chapter 6: Fatigue Failure		HW 4
6	M	2/22	Chapter 6: Fatigue Failure		
	W	2/24	Chapter 6: Fatigue Failure		
	F	2/26	Midterm Exam 1		
7	M	3/1	Chapter 7: Shaft design	HW 5	
	W	3/3	Chapter 7: Shaft design		
	F	3/5	Chapter 8: Screws, Fasteners		
8	M	3/8	Chapter 8: Screws, Fasteners	HW 6	HW 5
	W	3/10	Chapter 8: Screws, Fasteners		
	F	3/12	Chapter 8: Screws, Fasteners		
9	M	3/15	Chapter 8: Screws, Fasteners	HW 7	HW 6
	W	3/17	Chapter 10: Springs		
	F	3/19	Chapter 10: Springs		
10	M	3/22	Chapter 10: Springs	HW 8	HW 7
	W	3/24	Chapter 10: Springs		
	F	3/26	Chapter 10: Springs		

11	M	3/29	Chapter 13: Gears		HW 8
	W	3/31	Chapter 13: Gears		
	F	4/2	Midterm Exam 2		
12	M	4/5	Chapter 14: Spur gears		
	W	4/7	Wellness day- No Classes		
	F	4/9	Chapter 14: Spur gears		
13	M	4/12	Chapter 14: Spur gears	HW 9	
	W	4/14	Chapter 12: Lubrication and journal bearings		
	F	4/16	Chapter 12: Lubrication and journal bearings		
14	M	4/19	Chapter 12: Lubrication and journal bearings	HW10	HW9
	W	4/21	Chapter 12: Lubrication and journal bearings		
	F	4/23	Chapter 12: Lubrication and journal bearings		
15	M	4/26	Chapter 11: Rolling contact bearings		HW10
	W	4/28	Chapter 11: Rolling contact bearings		
	F	4/30	Chapter 11: Rolling contact bearings		
16			**Final Exam (TBA)**		

Grading:

Midterm Exam	40% (20%+20%)
Homework	30%
Final Exam	30%
TOTAL	100%

Standard grading scale (A>93, A- >90, B+ >87, B >83, B- >80, C+ >77, C >70, D >60 and F <60) will be followed.

Course website: The course website is in the CANVAS system. I will use the course website to post homework, solutions and all other announcements.

Homework: Assignments are due in **pdf format only**. **Late submissions will not be accepted.**

Study Section: Each week, the teaching assistants will hold offline 'study sections' where they will discuss theory (that I could not because of time constraint) or solve problems (so you see more examples than I could cover in the class). These offline session videos will be posted on Canvas.

Make up Exams: No makeup exams are allowed. There will be two exceptions, (1) the student brings a medical certificate and (2) the student appeals to the undergraduate program director, Dr. Eric Marsh, and Eric directly requests me to administer the exam.

Grading Complaints or Concerns: Must be submitted in writing.

Academic Integrity: Information pertaining to Penn State's policy on academic integrity can be found at http://www.engr.psu.edu/undergrad/acad_int/students/. In this course, students are permitted to work together on homework assignments, but each student is required to submit his or her own original work.

Disability Support: Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office for Disability Services (ODS) at 814-863-1807 (V/TTY). For further information regarding ODS, please visit the Office for Disability Services Web site at http://equity.psu.edu/ods/.

In order to receive consideration for course accommodations, you must contact ODS and provide documentation (see the documentation guidelines at http://equity.psu.edu/ods/guidelines/documentation-guidelines). If the documentation supports the need for academic adjustments, ODS will provide a letter identifying appropriate academic adjustments. Please share this letter and discuss the adjustments with your instructor as early in the course as possible. You must contact ODS and request academic adjustment letters at the beginning of each semester.