

Semester Fall 2020
Course Number ME1029
Course Title Mechanical Design 2

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Office Hours Thursday 10:30AM-12:00PM

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Lecture Time/Room Wednesday 8:15-11:00AM
 Zone4-202

Prerequisites MEMS 1028 Mechanical Design 1
 MEMS 0024 Intro to ME Design

Textbook Shigley's Mechanical Engineering Design by Richard G. Budynas and J. Keith Nisbett, 10th edition, McGraw-Hill Education, 2015.

Course Description This course is a 3 credit hour class. It is an advanced study with focus to introduce elements frequently used in mechanical designs. As the class evolves, students will develop (1) functionality understanding of components in static and dynamic mechanical applications, (2) thought process in the decision of selecting components for the targeted applications, and (3) analysis and synthesis methodologies for evaluation of the structural risks of the selected components.

To facilitate the understanding, design practices will be given to students periodically. Students will apply the learned knowledge to size their designs, deliberate the pros and cons of their designs, and systematically draw conclusions per analytical opinions.

Students will also involve in an extensive design project in this class. Students in teams will compete to develop a design for a product, applying structured design practices to real hardware.

Session	Class Date	Chapter	Topics	Homework
1	Sep 09		LN00 Course Overview	
2	Sep 16	Ch 3-16, 7-8	LN01 Thick-Walled Cylinder and Press Fits	HW01
3	Sep 23	Ch.05 (5.3 – 5.5, 5.7)	LN02 Static Failure LN03 Review: High-Cycle Fatigue Design	HW02 Design Exercise 01
4	Sep 30	Ch.06	LN03 Review: High-Cycle Fatigue Design	HW03
5	Oct 07 (Holiday)	Ch.07	LN04 Shafts and Shaft Components	HW04 Design Exercise 02
				Section Exam 01
6	Oct 14	Ch.08	LN05A Nonpermanent Connections	HW05
7	Oct 21	Ch.08	LN05B Screws, Fasteners, and Connections	HW06
8	Oct 28	Ch.08	LN05C Rivets and Welded Joints	HW07 Design Exercise 03

				Section Exam 02
9	Nov 04	Ch.12	LN06A Lubrication & Journal Bearings	HW08
10	Nov 11	Ch.12	LN06B Lubrication & Journal Bearings	HW09
	Nov 18	Ch.12	LN06B Lubrication & Journal Bearings	HW10 Design Exercise 04
11	Nov 25	Ch.11	LN07 Rolling Contact Bearings	HW11
12	Dec 02	Ch.11	LN07 Rolling Contact Bearings	HW12
13	Dec 09	Ch.11	LN07 Tapered Roller Bearings; Direct/Indirect Mount; Hertzian Contact	HW13 Design Exercise 05
				Section Exam 03
14	Dec 16	Ch.13	LN08A Gear Fundamentals	HW14
15	Dec 23	Ch.14	LN08B Spur Gear Design Analysis	HW15 Design Exercise 06
16	Dec 30		Sealing Elements	HW16
				Section Exam 04
17	Jan 06			Final Week

Homework	<p>Problem sets will be distributed each week after the class. Each problem set is designed to build upon the material covered in the preceding lectures and recitations. Homework assigned in a particular class is due at 8 AM on the day of the next class period, unless otherwise posted.</p> <p><u>Late HW will not be accepted.</u> HW missed due to unforeseeable emergencies will be handled on a case-by-case basis.</p>
Design Exercises	<p>Purposes</p> <ul style="list-style-type: none"> • apply the learned knowledge to practice sizing their designs, • deliberate the pros and cons of their designs, and • Identify the failure mechanisms and define pass/fail criteria • Draw systematical conclusions per analytical opinions. <p>Duration: ~2 Weeks for each DE Detailed requirements for DE report will be furnished later.</p>
Exams	<p>No midterm and final exams. Instead, they will be replaced by four section exams. Each section exam will focus on individual section subject.</p> <p>Section exams will be fast-paced and computation-intensive. Purpose is to test student's proficiency and familiarity with the section contents.</p> <p>The exams in this course will be open-book and open-note.</p> <p><u>No make-up will be given for the missing exam.</u> Exams missed due to unpredictable events will be dealt with on a case-by-case basis.</p>
Exam Calculator	<p>No programmable calculator of any kind is permitted in ME exams. Students can use their calculator of choice for other assignments.</p>
Grades	<p>Homework: 20%</p> <p>Section Exams: 40%</p> <p>Design Exercises: 40%</p>

附件：等级成绩和百分成绩、绩点对照表

字母等级	A	A-	B+	B	B-	C+	C	C-	D+	D	F
中文等级	优秀		良好		中等		合格			不合格	
百分制	100-90	89-85	84-80	79-76	75-73	72-70	69-66	65-63	62-61	60	<60
绩点	4	3.7	3.3	3	2.7	2.3	2	1.7	1.3	1	0

Class Attendance

Students are expected to attend every class period.
Early is on time, on time is late. As a courtesy to your fellow classmates, be punctual and arrive no later than the class starting time.

Academic Honesty

All of us are equally responsible for ensuring a fair and positive learning environment. Students are permitted to discuss homework assignments together, but should do their own work when preparing a problem solution.
All exams are to be completed without unauthorized assistance. Any student caught cheating on an assignment or exam will receive disciplinary action, up to and including receiving a grade of "F" for the course.