

<b>Identification</b>	<b>Subject</b>	ME 402 Machine Elements II, 6 ECTS	
	<b>Department</b>	Mechanical Engineering	
	<b>Program</b>	Undergraduate	
	<b>Term</b>	Spring, 2024	
	<b>Instructor</b>	Dr. Mehdi Kiyasatfar	
	<b>E-mail:</b>	mkiyasatfar@khazar.org	
	<b>Classroom/hours</b>		
	<b>Office hours</b>		
<b>Prerequisites</b>	Machine Element I		
<b>Language</b>	English		
<b>Compulsory/Elective</b>	Compulsory		
<b>Required textbooks and course materials</b>	<i>Shigley`s Mechanical Engineering Design 10<sup>th</sup> edition in SI units- R.G. Budynas, J.K. Nisbett</i>		
<b>Course website</b>			
<b>Course outline</b>	A continuation of ME 361, including analysis and design of power screws, brakes, clutches, belts, chain drives, gears, gear trains, bearings, and other machine elements.		
<b>Course objectives</b>	This course is designed to equip the students with the fundamentals of design activities and give them necessary skills to prepare complete, concise, and accurate calculation steps for machine elements. This is an advanced course on modeling, design, integration, and best practices for use of machine elements such as bearings, springs, gears, cams, and mechanisms.		
<b>Learning outcomes</b>	On successful completion of this course students will be able to:  <div><div>1.</div><div>Perform 3D stress analysis on mechanical components.</div></div> <div><div>2.</div><div>Design screws, fasteners, and nonpermanent Joints.</div></div> <div><div>3.</div><div>Perform stress analysis and design welding, bonding, and the design of permanent joints.</div></div> <div><div>4.</div><div>Design rolling-contact bearings.</div></div> <div><div>5.</div><div>Evaluate lubrication condition and design and journal bearings.</div></div> <div><div>6.</div><div>Perform stress analysis of gears.</div></div> <div><div>7.</div><div>Design clutches, brakes, couplings, and flywheels.</div></div> <div><div>8.</div><div>Design belts and chains.</div></div>		
<b>Teaching methods</b>	<b>Lecture</b>		x
	<b>Group discussion</b>		--
	<b>Experiential exercise</b>		--
	<b>Tutorials once a month on weekends</b>		--
	<b>Case analysis and assignments</b>		x
	<b>Course paper</b>		-
	<b>Others</b>		---
<b>Evaluation</b>	<b>Methods</b>	<b>Date/deadlines</b>	<b>Percentage (%)</b>
	<b>Midterm Exam</b>		25
	<b>Class Participation</b>		5
	<b>Quiz</b>		10
	<b>Project</b>		20
	<b>Final Exam</b>		40
	<b>Total</b>		100
<b>Policy</b>	<div><div>▪</div><div>Ethics</div><div>Copying other students’ work is highly discouraged. All assignments must be</div></div>		

				<p>handled by the student himself. This is a university policy and violators will be reprimanded accordingly.</p> <ul style="list-style-type: none"> <li>▪ <b>Preparation for class</b> The structure of this course demands your individual effort outside the classroom for extra practice of many problems within the textbook. After each session, every student needs to put sufficient time to practice and finish the assignments by the predetermined date.</li> <li>• <b>Withdrawal (pass/fail)</b> This course strictly follows the grading policy of the School of Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.</li> <li>▪ <b>Cheating/plagiarism</b> Cheating or other plagiarism in handling the assignments, Mid-term and Final Examinations will lead to course failure. In this case, the student will automatically get zero (0), without any considerations.</li> <li>▪ <b>Professional behavior guidelines</b> The students shall behave in a way to create a favorable academic and professional environment during the class hours.</li> <li>▪ <b>Attendance</b> Students who attend the sessions will get 5 marks. For three absence student loses 1 mark.</li> <li>▪ <b>Quiz</b> There will be quizzes for checking understanding of content during class. We are not going to give make up for a missing Quiz due to any reason other than medical report.</li> <li>▪ <b>Project</b> This course is one of the main courses in mechanical engineering. To get familiar with the basis of design of mechanical parts, it is mandatory to do a class project in this course. This means that you will not pass the course if you do not complete the project. The project will be about one of the course topics and will be defined for each student separately. The project delivery time is one week before the final exam.</li> <li>▪ <b>Final exam</b> The final exam in this course includes solving problems, definitions, and basic concepts of the course. The exam is an open book, and you are allowed to bring a textbook and calculator.</li> </ul>
				<b>Tentative Schedule</b>
<b>Week</b>	<b>Date/Day (tentative)</b>	<b>Topics</b>	<b>Textbook/Assignments</b>	
1		Syllabus. Overview of Machine Elements I.	Chap 1-10	
2		Rolling.	Chap 11	
3		Contact Bearings	Chap 11	

4		Lubrication.	Chap 12
5		Journal Bearings.	Chap 12
6		Gears: General I.	Chap 13
7		Spur Gears.	Chap 14
8		Review. <b>Midterm</b>	
9		Helical Gears.	Chap 14
10		Bevel Gears.	Chap 15
11		Worm Gears.	Chap 15
12		Clutches, Brakes.	Chap 16
13		Couplings, and Flywheels.	Chap 16
14		Flexible Mechanical Elements.	Chap 17
15		Belts and Chains.	Chap 17
16		<b>Final Exam</b>	