

Course Description Form	
Course Code and Name	MM 303-MACHINE ELEMENTS I
Course Semester	5
Catalog Content	<ol style="list-style-type: none"> 1. Machinery, Machine elements and Engineering Design. 2. Load and Stress Analysis 3. Bending and Stiffness, 4. Failure in Static Loading 5. Fatigue Failure in Variable Loading 6. Shafts and Shaft Components 7. Screws, Fasteners and Non-Stationary Connections - Power Screws, Rivets, Screw-Nut Connections 8. Welding and Design of non-detachable connections
Textbook	<p>Shingley, Makine Mühendisliği Tasarımı, Richard G. Budynas, J. Keith Nisbett, 8.Ed., Turkish, Literatür Yayıncılık, McGraw-Hill, 2015,</p> <p>Lecture Notes by B. Tuç ve N. Gemalmayan</p>
Supplementary Textbooks	<ol style="list-style-type: none"> 1. R. L. Norton, Machine Design: An Integrated Approach, Prentice Hall, 2006, 2. M. Gediktaş, Bağlama Elemanları, İTÜ Yayınları, 1988, 3. F. C. Babalık, Makine Elemanları ve Konstrüksiyon Örnekleri, Uludağ Üniversitesi Yayınları, 1997. 4. C. Kurbanoglu, Makine Elemanları Nobel yayınevi, 2006
Credit	5
Prerequisites of the Course (Attendance Requirements)	ME212 Strength of Materials, Attendance:70%
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	The aim of the course is to provide the students with the ability to calculate basic machine elements and select the correct element type for any mechanical application, analytical calculation, design and analysis of how it works in a mechanical system.
Course Learning Outcomes	<ol style="list-style-type: none"> 1. Ability to define loading types on machine elements. 2. Determine stresses and deformations under static and cyclic loadings 3. Understand shafts and axles. Design shafts and axles based on static and fatigue design criteria 4. Ability to define non-permanent joints, threaded fasteners, bolts-nuts and power screws. Design power screws, threaded fasteners and riveted joints 5. Defines shaft-hub connections, calculates tolerance and tight fit, and performs strength checks 6. Ability to define permanent connections, weld types and adhesive bonds. Analyse the strength of welded joints and design weld attributes
Instruction Methods	The mode of delivery of this course is face to face
Weekly Schedule	<ol style="list-style-type: none"> 1. Week: Introduction to machines, machine elements and engineering design 2. Week: Stress analysis. Static design criteria-Failures 3. Week: Static design criteria-failure prevention 4. Week: Fatigue design criteria-failure prevention 5. Week: Shafts and axles 6. Week: Keys, pins, fits and tolerances 7. Week: Keys, pins, fits and tolerances

	8. Week: Midterm 1; Screws, fasteners, and the design of nonpermanent joints- Power screws 9. Week: Screws, fasteners, and the design of nonpermanent joints- Bolts and nuts 10. Week: Screws, fasteners, and the design of nonpermanent joints- Bolts and nuts 11. Week: Screws, fasteners, and the design of nonpermanent joints- Riveted Joints 12. Week: Screws, fasteners, and the design of nonpermanent joints- Riveted Joints 13. Week: Midterm 2; Welding, bonding and design of permanent joints- weld types, adhesive bonds 14. Week: Welding, bonding and design of permanent joints- weld design 15. Week: Final Exam																																																						
Teaching and Learning Methods <i>(These are examples. Please fill which activities you use in the course)</i>	Weekly theoretical course hours: 3 Weekly applied course hours: 0 Reading Activities: 1 Internet browsing, library work :2 Report preparing :5 Presentations:0 Preparation of Midterm and Midterm Exam:8 Final Exam and Preparation for Final Exam:8 Other, Design project :1																																																						
Assessment Criteria	<table border="1" data-bbox="764 863 1328 1289"> <thead> <tr> <th></th> <th>Numbers</th> <th>Total Weighting (%)</th> </tr> </thead> <tbody> <tr> <td>Midterm Exams</td> <td>2</td> <td>50</td> </tr> <tr> <td>Assignment</td> <td>-</td> <td>0</td> </tr> <tr> <td>Application</td> <td>-</td> <td>0</td> </tr> <tr> <td>Projects</td> <td>1</td> <td>10</td> </tr> <tr> <td>Practice</td> <td>-</td> <td>0</td> </tr> <tr> <td>Quiz</td> <td>-</td> <td>0</td> </tr> <tr> <td>Percent of In-term Studies (%)</td> <td></td> <td>60</td> </tr> <tr> <td>Percentage of Final Exam to Total Score (%)</td> <td></td> <td>40</td> </tr> <tr> <td>Attendance</td> <td>70%</td> <td></td> </tr> </tbody> </table>				Numbers	Total Weighting (%)	Midterm Exams	2	50	Assignment	-	0	Application	-	0	Projects	1	10	Practice	-	0	Quiz	-	0	Percent of In-term Studies (%)		60	Percentage of Final Exam to Total Score (%)		40	Attendance	70%																							
	Numbers	Total Weighting (%)																																																					
Midterm Exams	2	50																																																					
Assignment	-	0																																																					
Application	-	0																																																					
Projects	1	10																																																					
Practice	-	0																																																					
Quiz	-	0																																																					
Percent of In-term Studies (%)		60																																																					
Percentage of Final Exam to Total Score (%)		40																																																					
Attendance	70%																																																						
Workload	<table border="1" data-bbox="764 1289 1409 1944"> <thead> <tr> <th>Activity</th> <th>Total Number of Weeks</th> <th>Duration (weekly hour)</th> <th>Total Period Work Load</th> </tr> </thead> <tbody> <tr> <td>Weekly Theoretical Course Hours</td> <td>14</td> <td>3</td> <td>42</td> </tr> <tr> <td>Weekly Tutorial Hours</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Reading Tasks</td> <td>6</td> <td>1</td> <td>6</td> </tr> <tr> <td>Studies</td> <td>14</td> <td>2</td> <td>28</td> </tr> <tr> <td>Material Design and Implementation</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Report Preparing</td> <td>4</td> <td>5</td> <td>20</td> </tr> <tr> <td>Preparing a Presentation</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Presentations</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Midterm Exam and Preperation for Midterm Exam</td> <td>2</td> <td>8</td> <td>16</td> </tr> <tr> <td>Final Exam and Preperation for Final Exam</td> <td>1</td> <td>8</td> <td>8</td> </tr> <tr> <td>Other (should be emphasized)</td> <td>5</td> <td>1</td> <td>5</td> </tr> <tr> <td>Total Workload</td> <td></td> <td></td> <td>125</td> </tr> </tbody> </table>			Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load	Weekly Theoretical Course Hours	14	3	42	Weekly Tutorial Hours	0	0	0	Reading Tasks	6	1	6	Studies	14	2	28	Material Design and Implementation	0	0	0	Report Preparing	4	5	20	Preparing a Presentation	0	0	0	Presentations	0	0	0	Midterm Exam and Preperation for Midterm Exam	2	8	16	Final Exam and Preperation for Final Exam	1	8	8	Other (should be emphasized)	5	1	5	Total Workload			125
Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load																																																				
Weekly Theoretical Course Hours	14	3	42																																																				
Weekly Tutorial Hours	0	0	0																																																				
Reading Tasks	6	1	6																																																				
Studies	14	2	28																																																				
Material Design and Implementation	0	0	0																																																				
Report Preparing	4	5	20																																																				
Preparing a Presentation	0	0	0																																																				
Presentations	0	0	0																																																				
Midterm Exam and Preperation for Midterm Exam	2	8	16																																																				
Final Exam and Preperation for Final Exam	1	8	8																																																				
Other (should be emphasized)	5	1	5																																																				
Total Workload			125																																																				

		Total Workload / 25	5,0				
		Course Credit (ECTS)	5				
Contribution Level Between Course Learning Outcomes and Program Outcomes	No	Program Outcomes	1	2	3	4	5
	1	Adequate knowledge of subjects specific to mathematics, natural sciences and related engineering disciplines; ability to use theoretical and applied knowledge related to these areas in complex engineering problems.				x	
	2	Ability to identify, define, formulate, and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods to this end.					x
	3	Ability to design a complex system, process, device or product under realistic constraints and conditions to meet specific requirements; ability to apply modern design methods for this purpose.					x
	4	Ability to develop, select and use modern techniques and tools required for the analysis and solution of complex problems encountered in engineering practice; ability to use information technologies effectively.				x	
	5	Ability to design and conduct experiments, collect data, analyze and interpret results to investigate complex engineering problems or discipline-specific research topics					
	6	Ability to work effectively in disciplinary and multi-disciplinary teams; ability to work individually.			x		
	7	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of at least one foreign language; the ability to write effective reports and understand written reports, to prepare design and production reports, to deliver effective presentations, to give and receive clear and understandable instructions.					
	8	Awareness of the necessity of lifelong learning; the ability to access information, to follow developments in science and technology, and to renew oneself constantly.					
	9	Acting in accordance with ethical principles, professional and ethical responsibility; information about standards used in engineering applications.					
10	Information about business life practices such as project						

		management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development.					
	11	Knowledge about the universal and social effects of engineering applications on health, environment and safety and the problems of the age reflected in the engineering field; awareness of the legal consequences of engineering solutions.					
The Course's Lecturer(s) and Contact Informations		<ol style="list-style-type: none"> 1. Prof. Dr. Oğuzhan Yılmaz, oguzhanyilmaz@gazi.edu.tr 2. Doç. Dr. Gökhan Küçükçtürk, gkucukturk@gazi.edu.tr 3. Dr. Öğr. Üyesi Nihat Gemalmayan, nihatgem@gazi.edu.tr 4. Öğr. Gör. Dr. Yavuz Zümrüt, yzumrut@gazi.edu.tr 					