	Course Description Form
Course Code and Name	ETM101 INTRODUCTION TO DESIGN ENGINEERING
Course Semester	1
Catalog Content	Professional and ethical responsibility understanding Ability to use modern engineering methods Teamwork and leadership skills Ability to communicate verbally and in writing Problem identification, formulation, and solving skills Ability to design, implement, and design experiments
Textbook	 Parameswaran, M.A., An Introduction to Design Engineering, Alpha Science Pub., Int. Edition, 2004 Cross, N., Engineering Design Methods-Strategies for Product Design, John Wiley & Sons, Ltd., New York, 2001.
Supplementary Textbooks	 Elder, W.E. ve Hosnedl, S., Design Engineering: A Manual for Enhanced Creativity, CRC Press, Int. Edition, 2008.
Credit	2 ECTS
Prerequisites of the Course (Attendance Requirements)	No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Understanding the engineering profession and ethics To learn the field of design engineering activity To learn solution approaches to engineering problems To have knowledge of basic design and engineering issues Develop teamwork skills
Course Learning Outcomes	 The aim of the courses to be taken in design engineering education and general concepts are learned. To have general information about design engineering. Have knowledge about the duties and authorization areas of design engineering. The importance of design engineering in innovative and sustainable development is understood. The place and importance of design engineering in society is understood. Design projects can be planned and executed at a basic level.
Instruction Methods	Face to face

	1. Week	Design engineering profe	ssion and	professional	ethics			
	2. Week	The meaning and importa	ance of de	sign				
	3. Week	Historical development of	f design					
	4. Week	The place of design in inc	dustry and	country deve	elopment			
	5. Week	Problem solving and com	municatio	on skills				
	6. Week	The methodology of design and its rules						
Weekly Schedule	7. Week	Principles of design						
	8. Week	Elementary design proces	55					
	9. Week	Analysing simple part des	signs					
	10. Week	Part-level design						
	11. Week	Simple part design applic	ations					
	12. Week	Analysing simple system	designs					
	13. Week	System-level design						
	14. Week	Simple system design applications						
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theored Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: 3 Preparation of Final Exam and	tical course hours: 2 1 hours: 0 ties: 0 ng, library work: 5 implementing materials: 5 ng: 0 esentation: 0 5 Midterm and Midterm Example 1 Preparation for Final Example	m: 3 m: 4					
		N S	umber	Total Weighti				
	Midterm Exar	ns	1	ng (%) 40				
	Assignment		1	20	1			
	Application							
Assessment Criteria	Projects							
	Quiz							
	Percent of In-	term Studies		60	1			
	(%) Dercentage of	Final Exam to		10				
	Total Score (% Attendance	6)		40				

		Activi ty	Total Numb er of Week s	I 0 () y h	Dui on we iou	rati ekl r)	i 		Tot al Peri od Wor k Loa d
	Weekl Hours	y Theoretical Course	14			2			28
	Weekl	y Tutorial Hours							
	Readir	ng Tasks							
Workload	Studie	s	1	5			5		
	and	al Design	I			5			5
	Impler	mentation							
	Report	t Preparing	1						
	Prepar	ring a Presentation	1			5			5
	Presen	itations							
	Preper Midter	ation for The Exam	1			3			3
	Final I Preper	Exam and ation for Final	1			4			4
	Exam Other	(should							
	be	()							
	empha Total V	usized) Workload							50
	Total	Workload / 25	-			-			50/25
	Course	e Credit (ECTS)							2
	N	Program Outco	mes	1	2	2	4	5	
	0						4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	Adequate knowledg mathematics, science engineering subject pertaining to the rel discipline; ability to theoretical and appliinformation in these model and solve en problems.	ge in ce and s levant o use lied e areas to gineering	x					
	2	Ability to identify, and solve complex engineering probler to select and apply analysis and model methods for this pu	formulate, ns; ability proper ing rpose.		x				
	3	Ability to design a system, process, de product under realis constraints and con such a way as to mo desired result; abili apply modern desig methods for this pu	complex vice or stic ditions, in eet the ty to gn rpose.						

	4	Ability to develop, select and use modern techniques and tools necessary for analysis and solution of complex problems in engineering applications; ability to use information technologies effectively.	x			
	5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.				
	6	Ability to work efficiently in intra-disciplinary teams.		x		
	7	Ability to work efficiently in multi-disciplinary teams.	x			
	8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.		x		
	9	Ability to write effective reports and understand written reports, to prepare design and production reports, to make effective presentations, to give clear and understandable instructions and to receive			X	
	1 0	Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.			x	
	1 1	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			x	
The Course's Lecturer(s) and Contact Informations		Department Management tasarim@gazi.edu.tr				

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome	Program Outcome5	Program Outcome6	Program Outcome7	Program Outcome	Program Outcome9	Program Outcome10	Program Outcome11
				4				8			
TOTAL	1	2		2		3	2	3	4	4	4
Learnin	1			1					1	1	
g											
outcome											
1											
Learnin		1		1					1		
g											
outcome											
2											
Learnin						1	1	1	1	1	1
g											
outcome											
3											

Learnin	1		1					1
g								
outcome								
4								
Learnin				1	1	1	1	1
g								
outcome								
5								
Learnin			1		1		1	1
g								
outcome								
6								

COURSE DESCRIPTION FORM

Course Code and Name	ETM103 TECHNICAL DRAWING 1					
Course Semester	1					
Catalog Content	Understanding and using technical drawing concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to communicate orally and in writing Ability to identify, formulate and solve problems					
Textbook	 Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012. 					
Supplementary Textbooks	1. Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.					
Credit	3 ECTS					
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	 To provide opportunities to develop the necessary communication skills to effectively share design concepts, ideas and constraints with colleagues and manufacturers. To provide opportunities to communicate design concepts and ideas to other colleagues and manufacturers using the language of technical drawing. Understand the engineering profession and ethics To learn the field of design engineering activity To learn solution approaches to engineering problems 					
Course Learning Outcomes	 Design engineering drawings can be interpreted accurately and the information given through the drawings can be understood. Design concepts, ideas and constraints can be communicated to designers and manufacturers by using the language of technical drawin effectively. Have knowledge about the duties and authorities of the design engineer. Provide traceability and feedback at every stage of the design process The place and importance of design engineering in society is understood. 					
Instruction Methods	Face to face					
	Hafta Konular 1 Introduction (basic terms, tools and materials, scales, paper types) 2 Types of writing and lines 3 Geometric drawings 4 Geometric drawing applications 5 Projection and its types					
Weekly Schedule	6 Appearance sticker 7 Appearance sticker applications 8 Sectional views					

	9	Sectional view appli	ications				
	10	Measurement and di	imensior	ning			
		Perspectives	antra				
	12	Tolerance and exerc	arks ises				
	14	Production pictures	1505				
	Weekly	theoretical course he	ours: 2				
Teaching and Learning Methods	Weekly	tutorial hours: 1					
	Reading	Activities: 0	l <i>E</i>				
	Designi	browsing, library we	ork: 5 7 materia	als: 5			
	Report	preparing: 0	Sindlerie				
	Preparii	ng a Presentation: 0					
	Presenta	ations: 0		F 0			
	Prepara Final Fr	tion of Midterm and	Midtern for Fina	1 Exam: 3			
			IOI I IIIa		F -		
			Nun	nders	otal weign	iting	
					(,,,)		
	Midter	m Exams	1		30		
	Assign	ment	1		20		
	Applic	ation	1		10		
Assessment Criteria	Project	S					
	Practic	e					
	Quiz	t of In town			60		
	Studies	(%)			00		
	Studie	, (, 0)					
	Percen	tage of Final Exam			40		
	to Tota	l Score (%)					
	Attend	ance					
			L,				
				Total	Duratio	To	otal
		Activity		Total Number of	Duratio n	To Per W	otal riod ork
		Activity		Total Number of Weeks	Duratio n (weekly	To Per W Lo	otal riod ork oad
	Weekly	Activity Theoretical Course Ho	vurs	Total Number of Weeks 14	Duratio n (weekly 2	To Per W Lo	otal riod ork oad 28
	Weekly Weekly	Activity Theoretical Course Ho Tutorial Hours	urs	Total Number of Weeks 14 14	Duratio n (weekly 2 1	To Per W Lo	otal riod ork oad 28 4
	Weekly Weekly Reading	Activity Theoretical Course Ho Tutorial Hours Tasks	urs	Total Number of Weeks 14 14	Duratio n (weekly 2 1	To Per W Lo 2	otal riod ork oad 28 4
	Weekly Weekly Reading Studies	Activity Theoretical Course Ho Tutorial Hours Tasks	urs	Total Number of Weeks 14 14 14	Duratio n (weekly 2 1 5	To Per W Lo 2	otal riod ork oad 28 4 5
	Weekly Weekly Reading Studies Material	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen	tation	Total Number of Weeks 14 14 14 2	Duratio n (weekly2155	To Pei W Lo 2 1	otal riod ork oad 28 4 5 0
Workload	Weekly Weekly Reading Studies Material Report I	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing	urs tation	Total Number of Weeks 14 14 14 2	Duratio n (weekly 2 1 5 5 5	To Per W Lo 2 1	otal riod ork pad 28 4 5 0
Workload	Weekly Weekly Reading Studies Material Report I Preparin	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation	tation	Total Number of Weeks 14 14 1 2	Duratio n (weekly 2 1 5 5	Te Pee W Le 2	otal riod ork oad 28 4 5 .0
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions	tation	Total Number of Weeks 14 14 1 2	Duratio n (weekly 2 1 5 5 5	To Per W Lo 2	28 4 5 0
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation	tation	Total Number of Weeks 14 14 1 2 2	Duratio n (weekly 2 1 5 5 5 3		ortal riod ork pad 28 4 5 0
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions h Exam and Preperation am and Preperation for	tation n for r Final	Total Number of Weeks 14 14 1 2 2 3	Duratio n (weekly 2 1 5 5 5 - - - - - - - - - - - - -		btal riod ork bad 28 4 5 0 6 2
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (s	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation for should be emphasized)	tation tation	Total Number of Weeks 14 14 1 2 2 3	Duratio n (weekly 2 1 1 5 5 5 3 4		btal riod ork pad 28 4 5 0 6 2
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (1)	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation am and Preperation for should be emphasized) orkload	tation n for r Final	Total Number of Weeks 14 14 1 2 2 3 3	Duratio n (weekly 2 1 1 5 5 5 4		otal riod ork pad 28 4 5 .0 6 .2 .75
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Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (S Total W Total W Course 0	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation am and Preperation for should be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor	tation tation n for r Final mes	Total Number of Weeks 14 14 1 2 3	Duratio n (weekly 2 1 1 5 5 5 4 - 1 1 1	Top Pee WW Lo 2 1 </th <th>otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5</th>	otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (1 Total W Total W Course 0 No 1	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions Exam and Preperation for should be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge	tation tation r for r Final mes of mathe	Total Number of Weeks 14 14 14 2 2 3 -	Duratio n (weekly 2 1 1 5 5 5	Top Pee WW 22 1 </th <th>otal otal riod ork oad 28 4 5 .0 </th>	otal otal riod ork oad 28 4 5 .0
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (s Total W Total W Course 0 No 1	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation am and Preperation for should be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering co	tation tation n for r Final nes of mathe	Total Number of Weeks 14 14 1 2 2 3 -	Duratio n (weekly 2 1 5 5 5 3 4 - 1 nce, led	Top Pee WW Lo 2 1 </th <th>otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5 x</th>	otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5 x
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (1 Total W Course 0 No 1	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions Exam and Preperation for should be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering co computing and spec ability to use this kn	tation tation n for r Final nes of mathe oncepts, c ific engin owledge	Total Number of Weeks 14 14 14 2 2 3 -	Duratio n (weekly 2 1 5 5 5 5 3 4 - - 1 - nce, led - s; n	Top Pee WW 2 1 <th>otal riod ork pad 28 4 5 .0 6 .2 75 /25 3 4 5 x</th>	otal riod ork pad 28 4 5 .0 6 .2 75 /25 3 4 5 x
Workload	Weekly Weekly Reading Studies Material Report I Preparin Presenta Midtern Final Ex Other (\$ Total W Course 0 No 1	Activity Theoretical Course Ho Tutorial Hours Tasks Design and Implemen Preparing g a Presentation tions a Exam and Preperation am and Preperation for should be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering cc computing and spec ability to use this kn solving complex eng	tation tation n for r Final nes of mathe oncepts, c ific engir owledge gineering	Total Number of Weeks 14 14 1 2 2 3 - - - - - - - - - - - - - - - - -	Duratio n (weekly 2 1 5 5 5 3 4 - 1 nce, led ;; n	Top Pee WW Lo 2 1 </th <th>otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5 x</th>	otal riod ork pad 28 4 5 0 6 2 75 /25 3 4 5 x

Contribution Level Between Course Learning Outcomes and Program Outcomes	2 3 4	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions. Ability to select and use appropriate techniques,				
		resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.				
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.				
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing		1	ĸ	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	x			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target				
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				x
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		X		
The Course's Lecturer(s) and Contact Informations	Head tasari	l of Department im@gazi.edu.tr				

	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program
	Outcome1	Outcome2	Outcome	Outcome4	Outcome 5	Outcome6	Outcome7	çıktısı 8	Outcome9	Outcome1	çıktısı 11
TOTAL	4		5	5	5		4	2		5	3
Learnin	1			1			1			1	1
g outcome 1											
Learnin	1			1			1	1		1	1
g outcome 2											
Learnin	1			1			1			1	
g outcome 3											
Learnin	1			1			1	1		1	1
g outcome											

4						
Learnin		1			1	
g						
outcome						
5						

DESCRIPTION FORM						
ETM104 TECHNICAL DRAWING 2						
2						
Understanding and using technical drawing concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to communicate orally and in writing Ability to identify, formulate and solve problems						
 Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012. 						
1. Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.						
3 ECTS						
No Prerequisites %70 Attendance Requirements						
Compulsory						
Turkish						
To provide opportunities to develop the necessary communication skills to effectively share design concepts, ideas and constraints with colleagues and manufacturers. To provide opportunities to communicate design concepts and ideas to other colleagues and manufacturers using the language of technical drawing. Understand the engineering profession and ethics To learn the field of design engineering activity To learn solution approaches to engineering problems						
 Design engineering drawings can be interpreted accurately and the information given through the drawings can be understood. Design concepts, ideas and constraints can be communicated to designers and manufacturers by using the language of technical drawing effectively. Have knowledge about the duties and authorities of the design engineer. Provide traceability and feedback at every stage of the design process. The place and importance of design engineering in society is understood. 						
Face to face						
HaftaKonular1Introduction (review of basic topics)2Shape and position tolerances3Construction painting applications4Assembly pictures5Standard parts and their representation in assembly6Assembly numbering and letterheads editing7Assembly drawing applications8Drawing part (construction) drawings from assembly drawings9Applications10Analysis and assembly drawings of simple designs11Applications12Mounting elements (screw fasteners, wedges, springs) and their						

	13 Gear wheels (spur) and cams									
	14 Applications									
	Weekly theoretical course	hours: 2								
Teaching and Learning Methods	Weekly tutorial hours: 1									
	Reading Activities: 0	vork 5								
	Designing and implementi	na materi	ale: 5							
	Report preparing: 0									
	Preparing a Presentation: 0									
	Presentations: 0									
	Preparation of Midterm and Midterm Exam: 3									
	Final Exam and Preparation for Final Exam: 4									
		Nur	nbers T	otal Weigh	ting					
				(70)						
	Midterm Exams	1		40						
	Assignment	1		20						
	Application									
Assessment Criteria	Projects									
	Practice									
				(0						
	Studies (%)			60						
	Demonstrate of Final Exam	1		40						
	to Total Score (%)	1		40	0					
	Attendance									
			Total	Duratio	Total					
	Activity		Number of	Duratio	Period	l				
	L. L		Weeks	(weekly	Work Load					
	Weekly Theoretical Course H	Iours	14	2	28					
	Weekly Tutorial Hours		14	1	14					
	Reading Tasks									
	reducing rusks				5					
	Studies		1	5	1					
	Studies Material Deciser and Incolore	mtation	1	5	3					
	Studies Material Design and Impleme	entation	1 2	5 5	10					
Workload	Studies Material Design and Impleme Report Preparing	entation	2	5	10					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation	entation	1 2	5 5	10					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations	entation	2	5 5	10					
Workload	Studies Material Design and Implemo Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperati	entation on for	1 2 2 2	5 5 3	10 6					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperati Final Exam and Preperation f	entation on for or Final	1 2 2 2 3	5 5 3 4	5 10 6 12					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperati Final Exam and Preperation f Other (should be emphasized	on for for Final	1 2 2 3	5 5 3 4	6 12					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperati Final Exam and Preperation f Other (should be emphasized Total Workload	entation on for for Final l)	1 2 2 3 -	5 5 3 4	3 10 6 12 75					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperati Final Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25	entation on for for Final l)	1 2 2 3 -	5 5 3 4 -	5 10 6 12 75 75/25					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperation Final Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS)	entation on for for Final l)	1 2 2 3 -	5 5 3 4 -	3 10 6 12 75 75/25 3					
Workload	Studies Material Design and Impleme Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outco	on for for Final l)	1 2 2 3 -	5 5 3 4 -	3 10 6 12 75 75/25 3 2 3	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outco 1 In-depth knowleds	on for <u>or Final</u> 1) Domes re of math	1 2 2 3 -	5 5 3 4 -	3 10 6 12 75 75/25 3 2 3 4 x	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentationss Midterm Exam and Preperati Final Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No 1 In-depth knowledg basic engineering	on for for Final l) omes ge of math concepts,	1 2 2 3 - ematics, scier computer-aide	5 5 3 4 - -	3 10 6 12 75 75/25 3 2 3 4 x	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outcol 1 In-depth knowledg basic engineering computing and specific	on for on for or Final 1) omes ge of math concepts, scific engi	1 2 2 3 - - computer-aide neering areas;	5 5 3 4 - -	3 10 6 12 75 75/25 3 2 3 4 x	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentations Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outco 1 In-depth knowledg basic engineering or computing and speciality to use this b	on for on for <u>or Final</u> 1) omes ge of math concepts, cocific engi cnowledge	1 2 2 3 - - computer-aidoneering areas; e effectively in	5 5 3 4 - -	3 10 6 12 75 75/25 3 2 3 4 x	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentationss Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No In-depth knowledg basic engineering computing and spea ability to use this I solving complex e	entation on for for Final 1) omes ge of math concepts, ecific engi cnowledge ngineering	1 2 3 - ematics, scier computer-aide neering areas; e effectively in g problems.	5 5 3 4 - -	3 10 6 12 75 75/25 3 2 3 4 x	5				
Workload	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentationss Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outco 1 In-depth knowledg basic engineering computing and spea ability to use this basic 2 Ability to identify.	entation on for for Final d) omes ge of math concepts, concepts, concepts, concepts, formulato	1 2 2 3 - - computer-aide neering areas; e effectively in g problems. e and analyse	5 5 3 4 - -	$ \begin{array}{c} 3\\ 10\\ \hline 10\\ \hline 6\\ 12\\ \hline 75\\ 75/25\\ \hline 3\\ 2 3 4\\ \hline x\\ \hline 1 \\ x\\ \hline 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$	5				
Workload Contribution Level Between Course Learning	Studies Material Design and Implement Report Preparing Preparing a Presentation Presentationss Midterm Exam and Preperating Final Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outcome 1 In-depth knowledge basic engineering or computing and spection of solving complex engineering or computing and spection of the solving complex engineering or complex	entation on for <u>for Final</u> 1) omes ge of math concepts, ecific engi cnowledge ngineering formulate	1 2 2 3 - - - - - - - - - - - - - - - - -	5 5 3 4 - -	3 10 6 12 75 75/25 3 2 3 4 x 1	5				
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes	Studies Material Design and Implemed Report Preparing Preparing a Presentation Presentationss Midterm Exam and Preperation f Other (should be emphasized Total Workload Total Workload / 25 Course Credit (ECTS) No Program Outco 1 In-depth knowledg basic engineering computing and spea ability to use this I solving complex e 2 Ability to identify, complex engineering of basic science, n and taking into acc	entation on for for Final 1) omes ge of math concepts, cecific engi cnowledge ngineering formulato ng proble nathematic	1 2 3 - - ematics, scier computer-aide neering areas; e effectively in g problems. e and analyse ms using know s and enginee IN Sustainab	5 5 3 4 - - - - - - - - - - - - - - - - - -	3 10 6 12 75 75/25 3 2 3 4 x 1	5				

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions. Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems,				x
	5	recognising their limitations. Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.				
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing			X	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	X			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target				
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				X
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations	Head tasar	l of Department im@gazi.edu.tr				

	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program
	Outcome1	Outcome2	Outcome	Outcome4	Outcome	Outcome6	Outcome7	çıktısı 8	Outcome9	Outcome1	çıktısı 11
			3		5					0	
TOTAL	4			5			4	2		5	3
Learnin	1			1			1			1	1
g											
outcome											
1											
Learnin	1			1			1	1		1	1
g											
outcome											
2											
Learnin	1			1			1			1	
g											
outcome											
3											
Learnin	1			1			1	1		1	1
g											
outcome											
4											
Learnin				1						1	
g											
outcome											
5											

Course Description Form								
Course Code and Name	ETM105 BASIC DESIGN 1							
Course Semester	1							
Catalog Content	Teamwork and leadership skills Ability to communicate verbally and visually, taking into account the user audience Problem identification and solving skills Ability to produce creative solutions Ability to think in an inquisitive way							
Textbook	 Zelanski, P., Fiscer, M.P., 1995. Design Principles and Problems, Fort Worth: Harcourt Brace. Pentak, D., Pentak, S., 2000, Design Basics, Fort Worth, Harcourt Brace. 							
Supplementary Textbooks	 Karim, M., & Chen, X., 2017. Digital design: basic concepts and principles. CRC Press. 							
Credit	4 ECTS							
Prerequisites of the Course (Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To have knowledge about basic design principles and elements Learning creative solution development approaches To be able to use design principles and elements in the product development process Develop teamwork skills							
Course Learning Outcomes	 The process of generating creative solutions under specified constraints is learned. Gain knowledge about research methods in problem identification and solving process. Understand the importance of working both individually and in interdisciplinary teams. The process of verbal and visual communication for the target audience is learned. The importance of awareness, curiosity, creativity and lifelong learning is understood. 							
Instruction Methods	Expression, practice.							

	1. Week	Introducing the aim	, scope and m	ethodology o	f the course				
	2. Week	Introduction of desi color-texture, light-	ign elements (l shadow, meas	Point, line, pl ure-proportic	ane, form, on, range)				
	3. Week	Introduction of desi color-texture, light-	Introduction of design elements (Point, line, plane, form, color-texture, light-shadow, measure-proportion, range)						
	4. Week	Realization of two- design elements	dimensional co	omposition st	tudies using				
	5. Week	Introduction of desi hierarchy, rhythm,	ign principles balance, unity	(contrast, em)	phasis,				
	6. Week	Realization of two a studies using design	and three dime 1 principles	ensional abstr	act design				
	7. Week	Introduction of desi hierarchy, rhythm,	ign principles balance, unity	(contrast, em)	phasis,				
Weekly Schedule	8. Week	Realization of two a studies using design	and three dime n principles	ensional abstr	act design				
	9. Week	Introduction of desi hierarchy, rhythm,	ign principles balance, unity	(contrast, em)	phasis,				
	10. Week	Realization of two a studies using design	and three dime n principles	ensional abstr	act design				
	11. Week	viples and ele es such as bra	s and elements (using ich as brainstorming						
	12. Week	Product design usin (creation of inspirat	g design princ tion boards and	ciples and ele d idea sketch	ments es)				
	13. Week	Product design usin (Mock-up studies)	ıg design princ	piles and ele	ments				
	14. Week	14. Week Product design using design principles and elements (Three-dimensional model, technical drawing and layou design preparations)							
	Weekly theoretical course hours: 2 Weekly tutorial hours: 2								
	Reading Activities: 0								
Teaching and Learning Methods	Internet browsin	g, library work: 2 mplementing materials	. 3						
(These are examples. Please fill which	Report preparing	g: 0							
activities you use in the course)	Preparing a Pres	entation: 2							
	Preparation of M	lidterm and Midterm E	Exam: 3						
	Final Exam and	Preparation for Final I	Exam: 3						
			Number	Total					
			S	Weight					
	Midterm Exams	3		····6 (/ 0)	1				
	Assignment]				
	Application		1	15					
Assessment Criteria	Projects		3	45					
	Ouiz				-				
	Percent of In-te	rm Studies		60					
	(%)								
	Percentage of Final Exam to Total 40 Score (%)								
	Attendance								

	Total	Durati	Tot
Activity	Numb	on	al

				er of Week s	() }	we iou	ekl r)			Peri od Wo rk Loa
	Weekly Theoretical Course			14	2				28	
	Hours Weekly Tutorial Hours			14	2				28	
	R	leading	Tasks							
Workload	S	tudies		10			2			20
	N a:	1aterial nd Impl	Design ementation	5			3			15
	R	leport P	reparing							
	P	reparing	g a Presentation	1			2			2
		resentat Aidterm	tions Exam and	1			1			1
	P	reperati	on for	1			5			5
	F	inal Exa	am and	1			3			3
	P C	reperati Other (s	on for Final Exam hould							
	b	e empha	asized)							100
		otal Wo	orkload	-			-			100/25
		Course C	Credit (ECTS)							4
		N	Program Outco	omes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		0 1 2 3 4	In-depth knowledge mathematics, science engineering concept computer-aided com and specific engineer areas; ability to use knowledge effective solving complex engi- problems. Ability to identify, f and analyse complex engineering problem knowledge of basic mathematics and en and taking into acco UN Sustainable Dev Goals. Ability to generate of solutions to complex engineering problem current and future n design complex syst processes, devices of under realistic const conditions. Ability to select and appropriate technique resources and mode engineering and info technology tools, in estimation and mode the analysis and solut complex engineering problems, recognistic limitations.	e of ee, basic ts, apputing pring this ely in gineering formulate x as using science, gineering, ount the velopment creative x as to meet eeds; tems, or products traints and I use use, rm ormation cluding elling, for ution of g ng their	x		x			
		5	Ability to use resear	ch			x			1

	methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems. Knowledge of the effects of engineering problems. Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions. 7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity. 8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (faceto-face, distance or hybrid). x 9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession). x	
	management and economic feasibility analysis; awareness of entrepreneurship and innovation.	
	1 Ability to learn independently x 1 and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	
The Course's Lecturer(s) and Contact Informations	Asst. Prof. Dr. Neslihan Top neslihantop@gazi.edu.tr	

	Program outcome1	Program outcome2	Program outcome3	Program outcome4	Program outcome5	Program outcome6	Program outcome7	Program outcome8	Program outcome9	Program outcome10	Program outcome11
TOTAL			3	1	3			2	2		1
Learning outcome 1			1								
Learning outcome 2					1						
Learning outcome 3								1			
Learning outcome 4			1	1	1			1	1		
Learning outcome 5			1		1				1		1

Course Description Form								
Course Code and Name	ETM106 BASIC DESIGN 2							
Course Semester	2							
Catalog Content	Teamwork and leadership skills Ability to communicate verbally and visually, taking into account the user audience Problem identification and solving skills Ability to produce creative solutions Ability to think in an inquisitive way							
Textbook	 Zelanski, P., Fiscer, M.P., 1995. Design Principles and Problems, Fort Worth: Harcourt Brace. Pentak, D., Pentak, S., 2000, Design Basics, Fort Worth, Harcourt Brace. 							
Supplementary Textbooks	 Karim, M., & Chen, X., 2017. Digital design: basic concepts and principles. CRC Press. 							
Credit	4 ECTS							
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To have knowledge about basic design principles and elements Learning creative solution development approaches To be able to use design principles and elements in the product development process Develop teamwork skills							
Course Learning Outcomes	 The process of generating creative solutions under specified constraints is learned. Gain knowledge about research methods in problem identification and solving process. Understand the importance of working both individually and in interdisciplinary teams. The process of verbal and visual communication for the target audience is learned. The importance of awareness, curiosity, creativity and lifelong learning is understood. 							
Instruction Method	Face to face							

	1. Week	Intr	oducing the aim, scope and methodolog	gy of the course						
	2. Week	Intr proj	Introducing the relationship between form and function and giving a project including single material - single function criteria							
	3. Week	Cre	ating inspiration boards and idea sketch	ies						
	4. Week	Eva	luation of three-dimensional mock-up s	studies						
	5. Week	Rea	lization of project presentations							
	6. Week	Intr	oducing the basics of modular design and dular products according to user needs	nd techniques for developing						
	7. Week	Mai	rket research and concept selection for 1	modular product design						
Weekly Schedule	8. Week	8. Week Creating inspiration boards and idea sketches								
	9. Week	Eva	luation of three-dimensional mock-up s	studies						
	10. Week	Rea	lization of project presentations							
	11. Week	11. Week Introducing corporate identity and brand design (a brand identity)								
	12. Week	Mai	rket research and concept selection for 1	modular product design						
	13. Week	Creating inspiration boards and idea sketches								
	14. Week	Eva	luation of three-dimensional mock-up s	studies						
Teaching and Learning Methods	 Weekly theoretical course hours: 2 Weekly tutorial hours: 2 Reading Activities: 0 Internet browsing, library work: 2 Designing and implementing materials: 3 Report preparing: 0 Preparing a Presentation: 2 Presentations: 1 Preparation of Midterm and Midterm Exam: 3 Final Exam and Preparation for Final Exam: 3 									
			Numbers	Total Weighting (%)						
	Midterm Exams									
	Assignment									
	Application									
	Projects		3	60						
	Practice									
Assessment Criteria	Quiz									
	Percent of In-terr	n		60						
	Studies (%)	1		40						
	From to Total	nal		40						
	Score (%)									
	Attendance									

			Activity	Total Numb er of Week s	I o (y h	Dur on wee	ati ekl r)			Tot al Peri od Wo rk Loa d
	Weekly Theoretical Course			14	2			28		
	v	Veekly 7	Tutorial Hours	14			2			28
	Reading Tasks									
Workload	S	studies		10			2			20
		Aaterial nd Impl	Design ementation	5			3			15
		renaring	a Presentation	1			2			2
		resentat	tions	1			-			- 1
	N	Aidterm	Exam and	1			3			3
		Preperati ∕Iidterm	on for Exam							
	F	inal Exa	am and	1			3			3
		Treperation Other (si	on for Final Exam							
	b	e empha	asized)							100
	Total Workload / 25		-	-			100/25			
		Course C	Credit (ECTS)							4
		N	Program Outco	omes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 0 1 2 3 4	In-depth knowledge mathematics, science engineering concept computer-aided com and specific engineer areas; ability to use knowledge effective solving complex engi- problems. Ability to identify, f and analyse comple engineering problem knowledge of basic mathematics and en and taking into acco UN Sustainable Dev Goals. Ability to generate of solutions to complex engineering problem current and future n design complex syst processes, devices of under realistic const conditions. Ability to select and appropriate technique resources and mode engineering and info technology tools, in estimation and mod the analysis and solu- complex engineerin problems, recognisi	of e, basic ts, nputing ering this ely in gineering formulate x as using science, gineering, ount the velopment creative x as to meet eeds; tems, or products traints and l use les, rm ormation cluding elling, for ution of g ng their			X			

	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems			X	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face- to-face, distance or hybrid).		X		
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		X		
	1 0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.				
	1	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	X			
The Course's Lecturer(s) and Contact Informations	Asst. neslih	Prof. Dr. Neslihan Top antop@gazi.edu.tr				

	Program outcome1	Program outcome2	Program outcome3	Program outcome4	Program outcome5	Program outcome6	Program outcome7	Program outcome8	Program outcome9	Program outcome10	Program outcome11
TOTAL			3	1	3			2	2		1
Learning outcome 1			1								
Learning outcome 2					1						

Learning outcome 3						1		
Learning outcome 4		1	1	1		1	1	
Learning outcome 5		1		1			1	1

	Course Description Form
Course Code and Name	ETM107 FREE HAND SKETCHING AND DRAWING TECHNIQUES
Course Semester	1
Catalog Content	Learning and applying basic drawing principles Ability to use different drawing techniques Ability to determine the proportions and ratios of objects accurately Ability to reflect light and shadow accurately Ability to quickly and effectively translate ideas into drawings
Textbook	 Necatiİnceoğlu, Murat Soygeniş, Ela Çil, TasarımdaEskizler, YıldızTeknikÜniverstesi Yay., İstanbul, 1997. Necatiİnceoğlu, Tan Gürer, Ela Çil, DüşünmeveAnlatımAracıOlarakEskizler, Helikon Yay., İstanbul, 1995.
Supplementary Textbooks	 Stanyer, P., The Complete Book of DRAWING TECHNIQUES (A Professional Quide for the Artist, Arcturus Pub., UK., 2003
Credit	2 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Understanding the creative process of design Learning basic principles and conceptual studies Developing the ability to translate the image in the designer's mind onto paper Enhancing visual thinking skills Strengthening spontaneous expression abilities
Course Learning Outcomes	 Understanding of the basic principles and concepts of the design process is developed, while also supporting creative thinking and problem-solving skills. Introduction to the fundamental concepts of art and design, with practical application; also provides an opportunity to acquire basic knowledge of art history and theory. Development of the ability to express imagination and transfer visual thoughts into drawings, thereby supporting visual communication skills. Strengthening of visual reading and interpretation abilities; gaining the ability to understand and evaluate different visual styles and aesthetics. Enhancement of spontaneous expression skills through rapid drawing and designing techniques, thus gaining the ability to effectively visualize desired messages.
Instruction Methods	Face to face

	1. Week	Presentation of course grading systems.	e content, sem	ester expectation	ons, and				
	2. Week	Overview of freehand	l drawing.						
	3. Week	Methods and techniqu	ues of freehand	d drawing.					
	4. Week	Drawing materials an	d techniques.						
	5. Week	Visualization of ideas	3.						
	6. Week	Drawing techniques -	Perspective.						
Weekly Schedule	7. Week	Drawing techniques -	Dimensions,	proportions.					
Weekly Schedule	8. Week	Drawing techniques -	Light, shadov	v.					
	9. Week	Drawing techniques -	Coloring.						
	10. Week	Drawing techniques -	Coloring.						
	11. Week	Product-specific diver representation.	Product-specific diversity of expression and material representation.						
	12. Week	Product-specific dive	Product-specific diversity of expression.						
	13. Week	Week Quick idea sketches.							
	14. Week	Quick idea sketches.							
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: (Preparation of Final Exam and	tical course hours: 1 1 hours: 1 ties: 5 ng, library work: 5 implementing materials ng: 0 ssentation: 0 0 Midterm and Midterm 1 d Preparation for Final 1	s: 6 Exam: 3 Exam: 3						
			Numbers	Total Weighting (%)					
	Midterm Exar	ns	1	40					
	Assignment		1	20					
	Application								
Assessment Criteria	Projects								
	Ouiz								
	Percent of In-1	term Studies		60					
	(%)								
	Percentage of	Final Exam to Total		40					
	Score (%)								
	Attendance								

		Activity	Total Numbe r of Weeks	Dur (wee hou	ation ekly r)	l	T Pe W Lo	otal riod ork oad
	Weekly Hours	Theoretical Course	14		2			28
	Weekly	Tutorial Hours						
	Reading	g Tasks	5		1			5
	Studies		5	1			5	
Workload	Material Design and Implementation		2	3			6	
	Bronori	Preparing						
	Present	ations						
	Midterm Exam and Preperation for Midterm		1	3			3	
	Final E: for Fina	xam and Preperation	1		3			3
	Other (emphas	should be ized)						
		/orkload	-		-		:	50
		/orkload / 25				50)/25	
	Course	Credit (ECTS)						2
	No Program Outcome		nes	1	1 2 3		4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas; abi this knowledge effecti solving complex engin problems.	f basic computer- specific lity to use ively in neering				X	
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using cience, neering, nt the UN nent Goals.	X				
	3	Ability to generate cre solutions to complex engineering problems current and future nee complex systems, pro- devices or products un realistic constraints ar	to meet eds; design cesses, nder nd			x		
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, inclu- estimation and modell the analysis and soluti complex engineering recognising their limit	ise s, mation uding ling, for ion of problems, tations.	x				

	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	X			
		engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.	x			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).	x			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x		
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		X		
The Course's Lecturer(s) and Contact Informations	Prot isah	f. Dr. İsmail Şahin in@gazi.edu.tr				

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	4	1	3	1	1		1	1	2		2
Learning outcome 1			1					1			1
Learning outcome 2	1	1					1				1
Learning outcome 3	1		1						1		
Learning outcome 4	1			1					1		

Learning	1	1	1			
outcome 5						

	Course Description Form
Course Code and Name	ETM201 MATERIAL SCIENCE
Course Semester	3
Catalog Content	Physical and chemical properties of materials Mechanical properties of materials and their measurement One-dimensional problems, two-component phase diagrams Solidification and diffusion principles in alloy systems Structure-property relationship in metal, ceramic, polymer and composite materials, types of corrosion, protection methods Application examples and industrial applications
Textbook	 Savaşkan, T. (2001). Malzeme bilgisi ve muayenesi eğitim bilimine giriş. Trabzon: Derya Yayıncılık. Uzun, H., Fındık, F. ve Salman, S. (2003). Malzeme biliminin temelleri. İstanbul: Değişim Yayıncılık.
Supplementary Textbooks	 Callister, W.D. (2003). An introduction to materials science and engineering. USA: John Wiley & Sons.
Credit	4 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Defining the basic physical and chemical properties of materials and understanding the importance of these properties in material selection. Understanding the mechanical properties of materials and factors such as strength, flexibility and hardness and learning methods to measure them. Understanding the properties of metal, ceramic, polymer and composite materials and evaluating the structure-property relationships of these materials. Defining corrosion, learning corrosion types and prevention methods.
Course Learning Outcomes	 Knows simple rules about basic materials science. Students can distinguish atomic relationships that affect material properties, and can clarify material density, conductivity and shaping properties. They have preliminary knowledge about the strength mechanisms of materials. They can use material knowledge to solve design problems by learning materials science topics and methods. Selection of materials suitable for the product and being able to measure their behavior.
Instruction Methods	Face to face

	1. Week	Classification of ma	aterials							
	2. Week	Atomic bonds, latti	ce systems							
	3. Week	Crystal systems								
	4. Week	Aging								
	5. Week	Material testing me	ethods							
	6. Week	Tensile, compression	on, bending,	torsion, fatigu	ie, impact	and hardne				
	7. Week	Alloy, phase, comp	onent definit	tion						
Weekly Schedule	8. Week	Phase law, cooling	curves, Iron-	cementite pha	ase diagra	m				
	9. Week	Isothermal transfor	mation and c	ontinuous coo	oling diag	rams				
	10. Week	Heat treatments of	steels, steel s	tandards, role	of alloyir	ng elements				
	11. Week	Stainless steels, too	ol steels, high	speed steels						
	12. Week	Non-metal material	on-metal materials							
	13. Week	Types of corrosion								
	14. Week Corrosion protection methods									
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: (Preparation of) Final Exam and	tical course hours: 3 I hours: 0 ties: 1 ng, library work: 1 implementing material ng: 0 esentation: 0) Midterm and Midterm I Preparation for Final	s: 0 Exam: 2 Exam: 2							
			Numbers	Total Weighting (%)						
	Midterm Exan	ns	1	60						
	Assignment									
	Application Projects									
Assessment Criteria	Practice									
	Quiz									
	Percent of In-t	term Studies		60						
	Percentage of	Final Exam to Total		40						
	Attendance									

		Activity	Total Numbe r of	Dur (wee hou	ation ekly r)		T Pe W Lo	otal criod ork oad
	Weekly	Theoretical Course	14		3		-	42
	Weekly	/ Tutorial Hours						
	Readin	g Tasks	5		1			5
	Studies		14		1			14
	Materia							
	Report							
Workload	Prepari	ng a Presentation						
	Present	ations						
	Midterm Exam and		4 2				8	
	Exam	ation for Midterm						
	Final E	xam and Preperation	3		2			6
	Other (should be						
	emphas	sized) Vortaland					,	75
	Total Workload Total Workload / 25 Course Credit (ECTS)		-		-		74	73 5/25
	Course	Credit (ECTS)					/.	3
	No	Program Outcom	nes	1	2	2	4	5
		T., J., 41, 1-1,1, J	£	1	2	5	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	mathematics, science, b engineering concepts, c aided computing and sp engineering areas; abilit this knowledge effective solving complex engine problems.		basic computer- specific lity to use ively in meering			X		
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using tience, neering, nt the UN tent Goals.			X		
	3	Ability to generate cro solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	eative to meet ds; design cesses, nder nd				x	
		Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl- estimation and model the analysis and soluti complex engineering recognising their limit	mation uding ling, for ion of problems, tations.		x			
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting gg data, eting complex				X	

	6 Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions. x
	7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity. x
	8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid). x
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession). x
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and x
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr

	Program Outcome	Program Outcome2	Program Outcome3	Program Outcome	Program Outcome5	Program Outcome6	Program Outcome	Program çıktısı 8	Program Outcome	Program Outcome10	Program Outcome11
	1			4			7		9		
TOTAL	3	3	5	2	4	3	3	2	1	2	2
Learning outcome 1			1	1	1	1	1				
Learning outcome 2		1	1	1		1					
Learning outcome 3	1	1	1		1						
Learning outcome 4	1	1	1		1		1	1		1	1
Learning outcome	1		1		1	1	1	1	1	1	1

Course Description Form						
Course Code and Name	ETM202 MANUFACTURING TECHNOLOGIES 1					
Course Semester	4					

Catalog Content	Understanding of Casting, Forging, and Welding topics Measurement and control skills Machining skills Understanding of Drilling, Turning, Boring, and related processes
Textbook	 Degarmo, E.P, Black, J.T. and Kohser, R.A. (1997). <i>Materials and processes in manufacturing</i>. USA: Prentice-Hall, Inc, Int. Ed. Boothroyd, G., Knight, W. A. (1989). <i>Fundamentals of machining and machine cutting</i>. New York: Mark Dekker Inc. M.P. Groover, <i>Fundamentals of modern manufacturing</i>, 3rd ed., 2007, Wiley
Supplementary Textbooks	 Kalpakjian, S., Schmid, S. R. (2005). <i>Manufacturing engineering and technology</i>. Londra: Pearson, 5th Ed. DeGarmo, E. P., Black, J. T. (2007). <i>Materials and processes in manufacturing</i>. USA: John Wiley & Sons, 10th Ed.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning Casting processes (sand casting, mold sanding, pattern preparation, molding, metal casting) Learning Welding techniques (oxy-acetylene welding, arc welding, submerged arc welding) Recognizing Casting and Welding defects Learning Metal processing methods (forging, pressing, extrusion, rolling) Learning Machining methods (wire drawing, machining procedures)
Course Learning Outcomes	 Learning basic operations and practical applications. Learning casting and forging methods. Learning welding techniques. Learning measurement-control tool and application methods. Learning machining methods.
Instruction Methods	Face to face Practical training

	1. Week	Introduction, basic co	ncepts, hand t	tools and their	uses				
	2. Week	Machining and Mach	ining; Basic o	perations					
	3. Week	Casting: Model and c	ore making						
	4. Week	4. Week Casting: Casting methods and applications							
	5. Week	5. Week Tattoo: Tattoo methods and applications							
	6. Week	Source and applicatio	n methods						
	7. Week	Application 1							
Weekly Schedule	8. Week	Application 2							
	9. Week	Measurement - Contro	ol						
	10. Week	Applications							
	11. Week	Machining: General to	ools, Machine	tools and their	r uses				
	12. Week	Hole drilling, Drilling	tools and dri	lling with diffe	erent methods				
	13. Week	Machining: Turning,	Turning proce	esses and appli	cations				
	14. Week	Machining: Milling, N	Milling proces	ses and application	ations				
	Weekly theoretical course hours: 2								
Teaching and Learning Methods	Weekly tutoria	l hours: 1							
reaching and Dear ning Methods	Reading Activi	ties: 0							
(These are examples. Please fill which	Internet browsi	ng, library work: 5							
activities you use in the course)	Designing and	implementing materials	s: 5						
	Report preparir	19:0							
	Preparing a Pre	esentation: 0							
	Presentations: (0							
	Preparation of	• Midterm and Midterm I	Exam: 4						
	Final Exam and	d Preparation for Final l	Exam: 4						
		<u>r</u>							
			Numbers	Total Weighting (%)					
	Midterm Exar	ns	1	60					
	Assignment								
	Application								
Assessment Criteria	Practice								
	Quiz								
	Percent of In-1 (%)	term Studies		60					
	Percentage of Score (%)	Final Exam to Total		40					
	Auchdance								

		Activity	Total Number of	Duratio n (weekly			Total Period Work Load		
	Weekly	Theoretical Course	14			2			28
	Weekly	Tutorial Hours	14			1			14
	Reading	g Tasks							
	Studies		2	5					10
	Materia Implem	ll Design and ientation	3			5			15
Westland	Report	Preparing							
workload	Prepari	ng a Presentation							
	Present	ations							
		tion for Midterm	1			4			4
		xam and Preperation	1			4			4
	Other (should be							
		Jorkload	_			-			75
	Total W	/orkload / 25							75/25
	Course	Credit (ECTS)					1		3
	No	Program Outcom	ies	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowle mathematics, scien engineering concepts, aided computing ar engineering areas; ab this knowledge effe solving complex of problems.	dge of ce, basic , computer- nd specific ility to use ectively in engineering		x				
	2	Ability to identify, for analyse complex problems using kno basic science, mathe engineering, and ta account the UN Development Goals.	rmulate and engineering owledge of matics and aking into Sustainable			x			
	3	Ability to generat solutions to complex of problems to meet of future needs; design systems, processes, products under constraints and condit	e creative engineering surrent and n complex devices or realistic				x		
	4	Ability to select appropriate technique and modern engine information technol- including estimate modelling, for the au- solution of complex of problems, recognis limitations.	and use s, resources eering and ogy tools, ion and nalysis and engineering ing their			X			
	5	Ability to use researce including literature designing and experiments, collec analysing and results, to investigat engineering problems	e search, conducting ting data, interpreting te complex				x		

	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.		x			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				x	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	x				
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).			x		
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x			
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x			
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr					

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	2	3	4	3	4	4	5	2	4	3	3
Learning outcome 1	1	1	1	1	1		1				
Learning outcome 2	1	1		1	1	1	1	1	1		1
Learning outcome 3			1	1	1	1	1		1	1	
Learning outcome 4			1		1	1	1		1	1	1
Learning outcome 5		1	1			1	1	1	1	1	1

Course Description Form						
Course Code and Name	ETM203 STATICS					
Course Semester	3					

Catalog Content	General principles. Vector operations. Force vectors. Particle equilibrium. Concept of moment. Equilibrium of rigid bodies. Structural analysis. Truss systems, support systems, and machines. Internal forces. Friction. Centroid and center of gravity. Moment of inertia. Virtual work method.							
Textbook	Hibbeler, "Engineering Statics"							
Supplementary Textbooks	1. Hibbeler, Engineering Mechanics 2. Ferdinand P. Beer "Engineering Statics"							
Credit	3 ECTS							
Prerequisites of the Course (
Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
	Learning the concepts of Force and Moment.							
	Learning the concept of Static Equilibrium.							
Course Objectives	Learning the concept of Internal Load							
	Understanding the concept of Friction.							
	Learning the concepts of Geometric Center and Moment of Inertia.							
Course Learning Outcomes	1. Acquiring the ability to draw Free Body Diagrams in mechanics and perform force-moment analyses.							
	2. Acquiring the ability to perform internal load analyses.							
	3. Learning the theory and application of engineering mechanics applied							
	to solid bodies under the influence of planar forces.							
	4. Learning the influence of three-dimensional force systems							
	5. Developing the ability to calculate geometric properties of cross-							
	sections.							
Instruction Methods	Face to face							
	Weeks Subjects							
	1 Introduction to Statics and Solid Mechanics, Fundamental Concepts and Principles Unit Systems							
	2 Vectors, Decomposition of Vectors, Vector Operations.							
	3 Force Vectors in Plane and Space, Equilibrium of particle, Eree Body Diagram (EBD)							
	4 Rigid Bodies, Internal and External Forces.							
Weekly Schedule	Equivalent Forces, Types of Supports.							
	5 Resultant Force Systems, Concept of Moment,							
	Moment of a Force about an Axis, Equilibrium of Rigid Rodies							
	6 Structural Analysis, Support Systems, Truss Systems,							
	Analysis and Calculation, Node and Section Method.							
	7 Application and Calculation of Support Systems to							
	Machines.							
	8 Internal Forces, Distributed Forces, Bending Moment in Beams							
	9 Shear Force and Bending Moment Diagrams.							
	10 Friction, Laws of Dry Friction, Coefficients of Friction,							
	Rolling Friction.							
	11 Belt-Pulley Friction.							
	Composite bodies.							
	13 Moments of Inertia, Area and Mass Moments of Inertia, Parallel Axis Theorem.							
	14 Principle of Virtual Work.							
	Weekly theoretical course							
Teaching and Learning Methods	hours: 3							
(These are examples. Please fill which activities you	Reading Activities: 0							
use in the course)	Internet browsing, library work: 0							
	Designing and implementing							
	materials: 2							
	Report preparing: 0 Preparing a Precentation: 0							
	I reparing a resonation. V							

	Presentations: 0 Preparation of Midterm and Midterm Exam: 10									
	Final Ex	xam and Preparation	for Final I	Exam: 15		7 •				
		Numbe			otal W	htir	ıg			
				()	, 0)					
	Midter	m Exams	1							
	Assign	ment	3		1	5				
	Applic	ation								
	Project	ts								
Assessment Criteria	Practic	e								
	Quiz		3		1	5				
	Percen Studies	t of In-term s (%)			ϵ	50				
	Percen to Tota	tage of Final Exam Il Score (%)			4	10				
	Attend	ance								
		Activity		Total Numbe r of Weeks	Dura n (wee hou	atio 1 ekly			'ota erio Vorl Joac	l d k ł
	Weekly	Theoretical Course Ho	urs	14	3				42	
	Weekly	Tutorial Hours								
	Reading	Tasks								
	Studies	,								
	Materia	Design and Implemen	4	4 2			8			
Workload	Report I	Prenaring		-						
	Prenarir	og a Presentation								
	Presents	ations								
	Midtern	Exam and Preneration	1)		10				
			1	1 10				15		
	Final Ex	am and Preperation for	r Final	1	,					
	Tatal W						_		75	
	Total W									
	Total W	orkload / 25					_	1	5/2:	·
	Course	Credit (ECTS)							3	
	No	Prog	gram Outc	omes		1	2	3	4	5
	1	basic engineering co computing and spec ability to use this kn solving complex eng	oncepts, con ific engine owledge et gineering p	mputer-aid ering areas ffectively i roblems.	ed ; n			x		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineering of basic science, ma and taking into acco Development Goals	ormulate a g problems thematics a unt the UN	nd analyse using kno and engined Sustainab	wledge ering, le				x	
	3	Ability to generate c engineering problem needs; design compl devices or products and conditions.	creative sol ns to meet o lex systems under reali	lutions to complex current and future is, processes, istic constraints				x		
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and polytion of complex arcia excitation and house							x	

recognising their limitations.				
5 Ability to use research methods, including				
literature search, designing and conducting				
experiments, collecting data, analysing and				
interpreting results, to investigate complex			+	_
6 Knowledge of the effects of engineering practices				
on society, health and safety, economy,				
sustainability and environment within the				
Gala averages of the logal consequences of				
engineering solutions				
A sting in accordance with the ethical principles			+	-
of the engineering profession awareness of				
ethical responsibilities: awareness of non-				
discrimination impartiality and embracing				
diversity.				
8 Ability to work effectively as a team member or		-	+	
leader both individually and within				
interdisciplinary teams (face-to-face, distance or				
hybrid).				
9 Ability to communicate effectively on technical				
issues, both orally and in writing, taking into				
account the various differences of the target				
audience (e.g. education, language, profession).	\rightarrow	_	+	_
10 Knowledge of business life practices such as				
project management and economic feasibility x				
anarysis, awareness of entrepreneurship and	\dashv	_	+	_
11 Ability to learn independently and continuously,				
to adapt to new and emerging technologies and to	x			
unitk inquisitivery about technological changes.				
Ine Course's Lecturer(s) and Contact Prot. Dr. Anmet IAŞKESEN				
taskesen@gazi.edu.tr				

	Program Outcom e 1	Program Outcom e 2	Program Outcom e 3	Program Outcom e 4	Program Outcom e 5	Program Outcom e 6	Program Outcom e 7	Program Outcom e 8	Program Outcom e 9	Program Outcom e 10	Program Outcom e 11
TOPLA M KATKI DÜZEYİ	3	4	3	4		1	1	1	1	1	2
Learning outcome 1	1		1			1	1	1	1	1	
Learning outcome 2		1		1							
Learning outcome 3		1	1	1							
Learning outcome 4	1	1	1	1							1
Learning outcome 5	1	1		1							1

Course Description Form					
Course Code and Name	ETM204 STRENGTH OF MATERIALS				
Course Semester	4				
Catalog Content	Fundamental principles of statics and mechanics, concepts of stress and strain, mechanical properties of materials, stress-strain relationship (Hooke's Law), elastic constants, tension, compression, shear, torsion,				

	bending stresses, bending and deflection in beams. Elastic curve equations stresses due to temperature changes, buckling, stability of structur compound loading, stress and strain transformation, principal stresses.						
Textbook	1. Russell C. Hibbeler, Mechanics of Materials, Pearson						
	1. Gere, J., Mechanics of materials,						
Supplementary Textbooks	2. Ferdinand P. Beer, Mechanics of Materials, McGraw-Hill						
Credit							
Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Concept of strain Displacement in axially loaded bars Stress and angle of rotation in elements subjected to torsion Bending stress in beams Shear stress in beams subjected to transverse shear Stress analysis in elements subjected to compound loading Stress transformation equations and concepts of principal stress and maximum shear stress with Mohr's Circle						
Course Learning Outcomes	 Ability to calculate stresses for elastic objects Ability to calculate unit deformations in elastic objects Ability to calculate the stress state at a point under combined loading for mechanical design Understand the concepts of principal stress and be able to apply stress transformation 						
Instruction Methods	Face to face						
	Weeks Subjects						
	1 Introduction - Concept and types of stresses.						
	 Allowable stress, safety factor. Concept of Strain 						
	 Mechanical properties of materials. Relationship between Stress and Strain. Tensile test. Hooke's Law; Modulus of Elasticity and material constants. 						
Weekly Schedule	5 Axial loading. Principle of superposition. Stresses and strains due to temperature changes.						
	6 Torsion. Stresses and strains in circular shafts. Angle of twist in elastic region. Design of power transmission shafts.						
	7 Torsion in non-circular elements. Torsion formula for thin-walled shafts.						
	8 Pure bending condition. Shear force and bending moment diagrams.						
	9 Bending and deflection in beams. Equation of elastic curve.						
	10 Shear stress in beams subjected to bending; Stress and Strain						
	11 Stress state due to compound loading.						
	12 Stress transformations in plane stress condition. Principal stresses.						
	Maximum shear stress.						
	13 Wohr's Circle in plane stress condition. 14 Buckling, Stability of structures; Euler's Formula.						
	Weekly theoretical course						
Teaching and Learning Methods	hours: 3 Weakly tyterial hours: 0						
(These are examples. Please fill which activities you	Reading Activities: 1						
use in the course)	Internet browsing, library work: 1						
	Designing and implementing						
	Report preparing: 0						
	Preparing a Presentation: 0						
	Presentations: 0 Preparation of Midterm and						
	Midterm Exam: 2						
	Final Exam and Preparation for Final Exam: 9						

		Num			Fotal Weighting (%)					
	Midter	m Fxams	1		30					
	Assignment					15				
	Applic	ation								
	Project	S								
Assessment Criteria	Practice									
	Quiz					15				
	Percent of In-term Studies (%)				50					
	Percentage of Final Exam to Total Score (%)			40			0			
	Attend	ance								
		Activity		Total Numbe r of	Dur: n (wee	atio klv		T Pe W	ota erio /orl .oac	l d k
				Weeks	Weeks ho		ur)		u	
	Weekly	Theoretical Course Ho	urs	14	3				42	
	Weekly	Tutorial Hours								
	Reading	Tasks		5	1	1		5		
	Studies			5	1			5		
Workload	Materia	Design and Implemen	4	4 2			8			
, or Rioud	Report I	Preparing								
	Preparir	g a Presentation								
	Presentations									
	Midtern	Exam and Preperation	n for	3	2			6		
	Final Exam and Preperation for Final			1	9			9		
	Other (should be emphasized)								
	Total Workload						_		75	
	Total Workload / 25						_	7:	5/2:	5
	Course	Credit (ECTS)				-			3	
	No	Prog	gram Outc	omes		1	2	3	4	5
	1	In-depth knowledge of engineering concepts and specific engineer knowledge effectivel engineering problems	tics, science aided comp bility to use complex	e, basic uting this				x		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, for engineering problems science, mathematics into account the UN Goals.	l analyse co wledge of ba ering, and t Developme	mplex asic aking ent				x		
	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.					x			
	4	Ability to select and use appropriat resources and modern engineering technology tools, including estimat modelling, for the analysis and solu engineering problems, recognising			es, nation mplex ations.			x		
	5	Ability to use research search, designing and collecting data, analys investigate complex er	methods, i conducting ing and intengineering p	ncluding lite experiment proting respecting respectively.	erature s, ults, to					
	6	Knowledge of the effects of engineering practices on x								

	8 9 10	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid). Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession). Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	x x x		
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x	
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Ahmet TAŞKESEN taskesen@gazi.edu.tr			

	Program çıktısı 1	Program çıktısı 2	Program çıktısı 3	Program çıktısı 4	Program çıktısı 5	Program çıktısı 6	Program çıktısı 7	Program çıktısı 8	Program çıktısı 9	Program çıktısı 10	Program çıktısı 11
TOPLAM	4	4	4	3		1	1	2	2	2	4
KATKI DÜZEYİ											
Öğrenim çıktısı 1	1	1	1	1				1			1
Öğrenim çıktısı 2	1	1	1	1						1	1
Öğrenim çıktısı 3	1	1	1	1					1	1	1
Öğrenim çıktısı 4	1	1	1			1	1	1	1		1

Course Description Form									
Course Code and Name	ETM205 ENGINEERING DESIGN TOOLS AND ELEMENTS								
Course Semester	3								
Catalog Content	Recognition of mechanical design elements (gears, cams, bearings, etc.) and understanding their functions Skill in constructing simple systems using mechanical design elements Ability to solve problems related to motion transmission Utilization of appropriate modeling methods								
Textbook	 Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi, 2023. 								
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi, 2019.								
Credit	4 ECTS								
Prerequisites of the Course (No Prerequisi	No Prerequisites - %70 Attendance Requirements							
---	---	---	--	---	--	--	--	--	--
Type of the Course	Compulsory								
Instruction Language	Turkish								
Course Objectives	Learning mec Turkish and V Conducting st their use in sy Learning com engineers nee Learning appr Acquiring kno Developing to	hanical tools and comp Vorld standards tudies on the modeling vstems unon problems and prace d to know during proje roaches to solving enging owledge about basic de camwork skills	onents used in of mechanical ctical approach ct design neering proble sign and engin	design accord science eleme nes that industr ms leering topics	ling to ents and rial design				
Course Learning Outcomes	 Learning e Being able systems w Developin componer Utilizing, componer or as a green 	engineering design and e to evaluate the function rithin the design. In the ability to generate the ability to generate the used in mechanical so modeling, and if necess the used in mechanical so pup, and presenting the	components. ons of compon e ideas and sol systems within sary, conductin systems within n.	ents used in m utions by usin a given probl ng prototype w the system, in	echanical g em. /ork for idividually				
Instruction Methods	Face to face Practical train	ning							
	1. Week	Introduction, Basic co	oncepts						
	2. Week	Gear wheel mechanisms							
	3. Week	Gear wheel mechanisms							
	4. Week	Gear wheel mechanisms, belt pulley and chain mechanisms							
	5. Week	Gear, pulley and chain mechanisms and their applications in design systems							
	6. Week	Gear, pulley and chai design systems	n mechanisms	and their appl	ications in				
Weekly Schedule	7. Week	Wedges, pins, pins, sl	nims, circlips						
	8. Week	Rivets and welds							
	9. Week	Springs and cams							
	10. Week	Practice							
	11. Week	Practice							
	12. Week	Bearings							
	13. Week	Bearings							
	14. Week	Construction example	s						
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 2 Reading Activities: 0 Internet browsing, library work: 2 Designing and implementing materials: 4 Report preparing: 2 Preparation of Midterm and Midterm Exam: 0 Final Exam and Preparation for Final Exam: 4								
			Numbers	Total					
				Weighting					
	Midterm Exar	ns		(/0)					

	Assignm	ent								
	Applicat	ion								
	Projects									_
Assessment Criteria	Practice									_
	Quiz	CT 4	0 (m 1 ¹ m	3				60 60		-
	(%)	of In-ter	m Studies					bU		
	Percenta	ge of Fi	nal Exam to Total					40		
	Attendar	nce								-
			Activity	Total Number of	Di (w	ura vee our	tio kly)	'n		Total Period Work Load
		Weekly	Theoretical Course	14			2			28
		Weekly	Tutorial Hours	14			2			28
		Reading	g Tasks							
		Interne	t browsing, library	3			2			6
		Materia	al Design and	5			4			20
		Report	entation Preparing	5			2			10
Workload		Prepari	ng a Presentation							
Workload		Present	ations							
		Midterr	n Exam and							
		Prepera	ation for							
		Final Ex	am and Preperation	2			4			16
	for Fina	l Exam								
		be emp	hasized)	_			_			_
		Total W	/orkload	-			-			100
		Total W	/orkload / 25							100/25
		Course	Credit (ECTS)							4
		No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learni Outcomes and Program Outcomes	ng	1	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoreti applied information i areas to model and so engineering problem	e in pertaining line; ical and n these olve s.		x				
		2	Ability to identify, fo and solve complex en problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering elect and s and or this		x				
		3	Ability to design a co system, process, dev product under realist constraints and condi- such a way as to mee desired result; ability modern design metho purpose.	omplex ice or itions, in et the to apply ods for this			x			

	4	Ability to develop, select and use modern techniques and			х			
		tools necessary for analysis and						
		in engineering applications:						
		ability to use information						
		technologies effectively.						
	5	Ability to use research methods including literature		х				
		search, designing and						
		conducting experiments,						
		interpreting results, to						
		investigate complex						
	6	Knowledge of the effects of			x			
	7	ethical principles of the						
		engineering profession,						
	8	Ability to work effectively as a team member or leader both		х				
		individually and within						
		interdisciplinary teams (face-						
		Ability to communicate			v			
	9	effectively on technical issues,			ĥ			
		both orally and in writing,						
		differences of the target						
		audience (e.g. education,						
	10	language, profession).			v			
	10	practices such as project						
		management and economic						
		of entrepreneurship and						
		innovation.						
	11	Ability to learn independently				x		
		and continuously, to adapt to						
		and to think inquisitively about						
		technological changes.						
The Course's Lecturer(s) and Contact	1.	Prof. Dr. Hüdayim BAŞAK, <u>hba</u>	<u>sak</u>	@	gaz	i.ed	lu.t	1
Informations								

	Program Outcome 1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program Outcome 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	2	2	3	3	2	3		2	3		4
Learning outcome 1	1	1	1	1							1
Learning outcome 2	1	1	1	1	1	1		1			1
Learning outcome 3			1	1	1	1		1	1		1
Learning outcome 4						1			2		1

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Progra m çıktısı 8	Program Outcome 9	Program Outcome1 0	Program Outcome1 1
TOTAL	2	3	4	5	2	1				2	2
Learnin	1	1	1	1							
g outcome 1											
Learnin		1	1	1	1						
g outcome 2											
Learnin			1	1						1	1
g outcome 3			-	-						-	
Learnin			1	1						1	
g outcome 4											
Learnin	1	1				1					
g outcome 5											
Learnin g outcome				1	1						1
0											

	Course Description Form
Course Code and Name	ETM208 MECHANISMS
Course Semester	4
Catalog Content	Engineering Basic concepts, Degrees of Freedom Crank Slider Mechanism 4 bar Mechanism Movement analysis Connecting Rod Curve Position, Speed, Acceleration Analysis
Textbook	 Eres Söylemez, Makina Teorisi-I Mekanizma Tekniği, 2017 İbrahim Deniz Akçalı, Mekanizma Tekniği Ahmet Özdemir, Ulvi Şeker, Mekanizmalar, 1995 J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition, McGraw Hill, 2014 Robert Norton Machine Design: An Integrated Approach, 6th Edition, Pearson, 2019
Supplementary Textbooks	 Sclater, Neil; Chironis, Nicholas, Mechanisms and Mechanical Devices Sourcebook, Fourth Edition. Neil Sclater, Mechanisms and Mechanical Devices Sourcebook, 5th Edition 5th Edition.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish

Course Objectives	Learning the f Learning solu Having know In order for st of movements movements. They have the types required	field of design engineer tion approaches to engi ledge of basic design an udents to realize basic s and which mechanism e ability to determine th l for the design.	ing activity ineering probl nd engineering Machine Desi approaches c e movement t	ems g issues gn, they learn can provide the types and mech	the types ese nanism			
Course Learning Outcomes	 The purpos and general co Knows wha Learns engined Recognizes Place of use according to ways 	e of the courses to be ta oncepts are learned. at engineering skills a d ineering calculation app s mechanisms and know e of mechanisms - gain working conditions.	aken in design lesign enginee proaches. vs where to us calculation at	n engineering e er should have. se them. nd design abili	ducation ty			
Instruction Methods	Face to face							
Weekly Schedule	1. Week 2. Week 3. Week 4. Week 5. Week 6. Week 7. Week 8. Week 9. Week 10. Week 11. Week 12. Week 13. Week 14. Week	Basic concepts: Math Introduction of the G mechanisms Degrees of Freedom Degrees of Freedom Classification of mec Crank – Slider (3 bar 4 bar mechanism mot Crank – Slider (3 bar 4 bar mechanism Cor Synthesis of mechani Synthesis of mechani Kinematic analysis, p analysis approaches (Kinematic analysis, p analysis approaches (Kinematic analysis, p analysis approaches (ematics and F eneral Concep Applications hanisms) mechanism f ion analysis) mechanism f ion analysis) mechanism f mecting rod c sms (3 bar me sms (4 bar me osition, veloc 3 rod mechan osition, veloc 4 rod mechan	Physics approac ot and basic motion analysi Connecting roc urve echanism) echanism) ity and acceler theorems and ity and acceler ism) ity and acceler ism)	ches			
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutorial Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: (Preparation of I Final Exam and	ical course hours: 2 hours: 1 ties: 3 ng, library work: 1 implementing materials ng: 0 sentation: 0) Midterm and Midterm 1 h Preparation for Final 1	s: 3 Exam: 8 Exam: 8 Numbers	Total				
Assessment Criteria	NumbersTotal Weighting (%)Midterm Exams1Assignment30Application-Projects19 Practice-Quiz-Percent of In-term Studies60							

Percentage of Final Exam to Total Score (%)	40	
Attendance		

		Activity	Total Numbe r of Weeks	Dur (we hou	•ation ekly r)	l	To Pe W Lo	otal riod ork ad
	Weekly Hours	Theoretical Course	14		2			28
	Weekly	Tutorial Hours	14		1			14
	Reading	g Tasks	2		3			6
	Studies		5		1			5
	Materia Implem	l Design and entation	2		3			6
Workload	Report	Preparing						
	Prepari	ng a Presentation						
	Present	ations	1		0			0
	Preperation for Midterm Exam		1	8			8	
	Final E for Fina	xam and Preperation	1		8			8
	Other (emphas	should be ized)						
	Total W	/orkload	-		-		ŕ	75
	Total W	/orkload / 25					75	5/25
	Course	Credit (ECTS)					3	
	No	Program Outcom	nes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engi- problems.	of basic computer- specific ility to use ively in neering					X
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic so mathematics and engi and taking into accour Sustainable Developn	rmulate using cience, neering, nt the UN nent Goals.					X
	3	Ability to generate cre solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet eds; design cesses, nder nd			x		
	4	Ability to select and u appropriate technique resources and modern engineering and infor technology tools, incl estimation and model the analysis and solut complex engineering recognising their limi	ise s, mation uding ling, for ion of problems, tations.			x		

	5 A in da ey au re ei 6 K	bility to use research methods, neluding literature search, esigning and conducting xperiments, collecting data, nalysing and interpreting esults, to investigate complex ngineering problems.		X			
	ei ha su W S av co so	ngineering practices on society, ealth and safety, economy, ustainability and environment <i>v</i> ithin the framework of the UN ustainable Development Goals; wareness of the legal onsequences of engineering olutions.					
	7 A et av re na ai	acting in accordance with the thical principles of the ngineering profession, wareness of ethical esponsibilities; awareness of on-discrimination, impartiality nd embracing diversity.					
	8 A te in in fa	bility to work effectively as a eam member or leader both ndividually and within nterdisciplinary teams (face-to- ace, distance or hybrid).	x				
	9 A et bo ta di au la	bility to communicate ffectively on technical issues, oth orally and in writing, aking into account the various ifferences of the target udience (e.g. education, anguage, profession).					
	10 K pr m fe	nowledge of business life ractices such as project nanagement and economic easibility analysis; awareness f entrepreneurship and					
	11 A an no an te	bility to learn independently nd continuously, to adapt to ew and emerging technologies nd to think inquisitively about echnological changes.					
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Murat Tolga ÖZKAN tozkan@gazi.edu.tr						

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							

Learning outcome 4	1	1					
Learning outcome 5	1	1					

COURSE DESCRIPTION FORM										
Course Code and Name	ETM2	10 ELECTRONICS FOR PRODUCT AND SYSTEM DESIGN								
Course Semester	4									
Catalog Content	Having Ability Ability Teamw Ability Ability	g a basic knowledge of electricity and electronics to perform electrical circuit analysis to use modern engineering methods york and leadership skills to communicate verbally and in writing to design, implement, and conduct experiments								
Textbook	8. Çelo 9. Özk	ebi, H.H. (1999). <i>Elektrik bilgisi</i> . İstanbul: Yüce Yayınları. can T. (1995). <i>Temel elektronik</i> . İstanbul: Kayhan Matbaası								
Supplementary Textbooks	1. Den İsta	nirel, H. (2012). <i>Elektronik devre elemanları elektronik devreler</i> . nbul: Birsen Yayınevi								
Credit	2 ECTS									
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements									
Type of the Course	Compu	lsory								
Instruction Language	Turkish									
Course Objectives	To be able to understand electrical circuits and instruments and use the in designs To be able to use electronic systems in industrial products To learn solution approaches to engineering problems									
Course Learning Outcomes	 Gair industr To h system Und design Basi Simp 	a knowledge about the use of electrical and electronic systems in ial design. have general knowledge about basic electrical and electronic s. erstand the importance of electrical and electronic systems in engineering. c electrical circuit analysis can be performed. ble design examples of electronic elements can be realized.								
Instruction Methods	Face to	face								
	Hafta	Konular								
Weekly Schedule	$ \begin{array}{c} 1\\ 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ \end{array} $	Introduction The meaning and importance of design Historical development of design The importance of design for the national and industrial development Important designs and innovations The methodology of design and its rules Fundamentals of design Elementary design process Analysing simple part designs Component design Applications of component designs Analysing simple system designs System design Applications of system designs								
	14	Applications of system designs								

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 0 Reading Activities: 0 Internet browsing, library work: 1 Designing and implementing materials: 2 Report preparing: 3 Preparing a Presentation: 2 Presentations: 2 Preparation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 3												
			Numb	oers T	rs Total Weighting (%)								
			1			10							
	Assign	m Exams	1		1	0							
	Assign	ation	1		1	0							
Assassment Criteria	Project	s	1										
Assessment Criteria	Practic	e											
	Quiz												
	Percen	t of In-term			(50							
	Studies	s (%)											
	Percen	tage of Final Exam			2	10	0						
	to 1 ota	ance											
	Attend												
		Activity	Total Number of	Dura n (wee	ntio kly	Peri Wo			l L				
	Weekly	Theoretical Course Ho	ours	14	2	J		-	28				
	Weekly	Tutorial Hours					+						
	Deading	Taala	o ary work: 1 enting materials: 2 n: 2 n and Midterm Exam: 2 ration for Final Exam: 3 Total Weighting (%) Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 Image: 1 <th colspan="2</td>										
	Reading	Tasks		1	1		+		1				
	Studies		4	1		-							
	Materia	Design and Implement	itation	2	2				4				
Workload	Report F	Preparing		l	3				3				
	Instant of the second system, secon	2											
		2											
	Midterm Midterm	n Exam and Preperation	n for	2	2			tal Weighting (%) 40 10 10 10 60 60 40 10 60 10 40 10 10 10 11 4 2 28 1 4 2 28 1 4 2 28 1 4 2 28 1 4 2 28 1 4 2 2 2 2 2 2 1 4 2 2 2 4 3 3 - 50/25 2 2 1 2 3 40 1 1 1 2 3 4 5 50/25 2 2 4 5 6 1 1 1 1 2 3<					
	Reading Activities: 0 Internet provide: 1 Designing and implementing materials: 2 Report preparing: 3 Preparation of Midterm and Midterm Exam: 2 Total Weighting (%) Total Weighting (%) Mumbers Total Weighting (%) Midterm Exam: 3 Total Weighting (%) Midterm Exam: 1 10 Assignment 1 Activity Total Meighting (%) Precent of In-term 60 Studies (%) Outation Precentage of Final Exam 40 Veckly Theoretical Course Hours 14 2 Weekly Theoretical Course Hours 14 2 Weekly Theoretical Course Hours 14 2 Weekly Theoretical Course Hours 14 2 Studies 4 1 Meekly Theoretical Course Hours	3											
	Total W	orkload		-	-				50				
	Weekly tutorial hours: 0 Reading Activities: 0 Internet browsing, library work: 1 Designing and implementing materials: 2 Report preparing: 3 Preparing a Presentation: 2 Presentation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 3 Image: Construct the second se)/25	5										
	Course (Credit (ECTS)							2				
	No	Program Outcon	nes		1	1	2	3	4	5			
	1	In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problems.x											
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	hours: 0 ies: 0 ng, library work: 1 mplementing materials: 2 g: 3 sentation: 2 Aidterm and Midterm Exam: 2 Preparation for Final Exam: 3 Numbers Total Weighting (%) Veighting (%) Total Veighting (%) is 1 40 1 1 10 1 10 is 1 40 1 is 1 40 1 is 1 40 1 is 1 40 1 is 1 40 1 is 1 10 1 is 1 10 1 is 1 10 1 is 1 2 28 Final Exam 14 2 28 Hours - - - ia 1 3 3 intation 1 2 2 id Preparation for 2 2 4 ia 1 3 3 iatation 1 2 2 id Preperation for 2 2 4 <tr< th=""></tr<>										
	and taking into account the UN Sustainable 3 Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and candidate and candidate									X			

	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations. Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and			x	x	
	6	engineering problems. Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of	X				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing		X			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target					
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	X				
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.					
The Course's Lecturer(s) and Contact Informations	Head tasar	l of Department im@gazi.edu.tr					

	Program Outcome1	Program Outcome2	Program Outcome	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1	Program çıktısı 11
TOTAL	4	4	5	3	4	1	2			1	
Learnin g outcome 1	1	1	1		1						
Learnin g outcome 2	1	1	1	1	1		1				
Learnin g outcome 3	1	1	1		1	1	1				
Learnin g outcome 4			1	1							
Learnin g outcome 5	1	1	1	1	1					1	

	Course Description Form
Course Code and Name	ETM212 COMPUTER AIDED DESIGN 1

Course Semester	4										
Catalog Content	Design 2D an Ability to use Defining prob Adapting to n	d 3D parts computer software plems and creating solution suggestions ew technologies									
	1. Lombard, N	and 3D parts ise computer software soblems and creating solution suggestions o new technologies I, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. A, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizir , Gazi Kitabevi, Ankara, 2008. I. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çiz eme – Analiz, Gazi Kitabevi, Ankara, 2012.									
Textbook	2. Taşkesen, A Modelleme, C	A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Gazi Kitabevi, Ankara, 2008.									
	4 Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies 1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 1. Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim ve Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012. 2 ECTS No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design on sheat metal design and processing techniques in a computer-aided design on sheat metal design and processing techniques in a computer-aided design on sheat metal design and 3D models using computer-aided design tools 2. Can design functional assemblies by combining different parts 3. Can create technical documents in accordance with engineering standards Face to face 1. Week Introduction and Fundamentals of Computer Aided Desig 2. Week 3D Drawing Fundamentals										
Supplementary Textbooks	1. Mendi, F Modellem	., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim – e – Analiz, Gazi Kitabevi, Ankara, 2012.									
Credit	2 ECTS										
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites- %70 Attendance Requirements										
Type of the Course	Compulsory Turkish To teach students the basic principles of computer-aided design and 2D										
Instruction Language	Turkish	No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide knowledge and application skills on sheet metal design and									
Course Objectives	To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design environment. Creating construction pictures of a product and/or system										
Course Learning Outcomes	 Students models u Can desig Can creat standards 	can accurately and effectively create 2D drawings and 3D sing computer-aided design tools gn functional assemblies by combining different parts the technical documents in accordance with engineering									
Instruction Methods	Face to face										
	1. Week	Introduction and Fundamentals of Computer Aided Design									
	2. Week	2D Drawing Fundamentals and Tools									
	3. Week	Advanced 2D Drawing Techniques and applications									
	4. Week	3D Modeling Fundamentals									
	5. Week	3D Part Modeling Techniques									
	6. Week	2D and 3D parts to use computer software g problems and creating solution suggestions g to new technologies pard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. esen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim me, Gazi Kitabevi, Ankara, 2008. c, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. di, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizin kelleme – Analiz, Gazi Kitabevi, Ankara, 2012. 5 equisites- %70 Attendance Requirements sory n students the basic principles of computer-aided design and 2D techniques. ide students with practical skills in solid and surface modeling in g their 3D modeling skills. ug the design of complex products and systems ide ktowledge and application skills on sheet metal design and ing techniques in a computer-aided design norment. g construction pictures of a product and/or system dents can accurately and effectively create 2D drawings and 3D dels using computer-aided design tools a design functional assemblies by combining different parts rereate technical documents in accordance with engineering dards face c Introduction and Fundamentals of C									
	7. week										
Weekly Schedule	Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies 1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 1. Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizin Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012. 2 ECTS No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design environment. Creating construction pictures of a product and/or system 1. Students can accurately and effectively create 2D drawings and 3D models using computer-aided design tools 2. Can design functional assemblies by combining different parts 3. Can create technical accurately and effectively create 2D drawings and 3D models using computer-aided design tools 2. Week 2D Drawing Fundamentals of Computer Aided Desig 2. Week 3D Part Modeling Techniques 4. Week 3D Part Modeling and Application										
	4 Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies 1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim v Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 1. Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012. 2 ECTS 6 No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design environment. Creating construction pictures of a product and/or system I. Students can accurately and effectively create 2D drawings and 3D models using computer-aided design tools 2. Can design functional assemblies by combining different parts 3. Can create technical documents in accordance with engineering standards Face to face 1. Week Introduction and Fundamentals of Computer Aided Desig 2. Week										
	4 Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies 1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 1. Mendi, F., Kişoğlu, Y. ve Teşkesen, A., SolidWorks: Çizim - Modelleme - Analiz, Gazi Kitabevi, Ankara, 2012. 2 ECTS No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing construction pictures of a product and/or system 1. Students can accurately und effectively create 2D drawings and 3D models using computer-aided design tools 2. Can creat technical documents in accordance with engineering standards 7 Face to face 1. Week Introduction and Fundamentals of Computer Aided Design 3. Week 3. Week 3D Part Modeling Techniques 6. Week 3D Part Modeling Techniques 6. Week 4. Week 3D Part Modeling and Editing 9. W										
	4 Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies 1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F. Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 1. Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012. 2 ECTS No Prerequisites- %70 Attendance Requirements Compulsory Turkish To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design onvinoment. Creating construction pictures of a product and/or system 1. Students can accurately and effectively create 2D drawings and 3D models using computer-aided design tools 2. Can design functional assemblies by combining different parts 3. Can create technical documents in accordance with engineering standards Face to face 1. Week Introduction and Fundamentals of Computer Aided Design Queek 3. Weeek 3D Part modeling Techniques<										
	13. Week	Surface modeling Design and Modeling									
	14. Week	Surface modeling Application									

Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 4 Internet browsing, library work: 10 Designing and implementing materials: 0 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam:2 Final Exam and Preparation for Final Exam: 2									
				Numbers	8	W	Fot eigh	al iting	g	
	Midterm	Exams		1			<u>(</u> 70 4(-		
	Assignm	ent		1			20)	-	
	Applicat	ion					-			
Assassment Critoria	Projects									
Assessment Criteria	Practice									
	Quiz									
	Percent	of In-ter	m Studies				60)		
	(%)	CD '					40		_	
	Percenta	ge of Fi	nal Exam to Total				40)		
	Attendar	nce								
	11	1		Tetal	D	rat	To	tal		
			Activity	Number of Weeks	(weekly hour)				Per Wo Loa	iod rk id
		Weekly Hours	Theoretical Course	14			2		2	8
		Weekly	Tutorial Hours	14			1		1	4
		Reading	g Tasks							
		Studies	2	2			4	4		
		Materia Implem	l Design and entation							
		Report	Preparing							
Workload		Prepari	ng a Presentation							
		Present	ations							
		Midterr	n Exam and	1			2		2	2
		Prepera	tion for Midterm							
		Exam Final F	xam and Preperation	1			2		-	,
		for Fina	al Exam	1			4			-
		Other (should be							
		Total W	lized)				_		5	0
		Total W	Vorkioad / 25						50	/25
		Commo	Credit (ECTS)						- 50/	25
		Course	Dream (ECTS)		$\left \right $					-
		No		les	1	2	3 4	4 5		
Contribution Level Between Course Learning Outcomes and Program Outcomes		1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in neering	x					

2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals.		x			
3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.			x		
4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		X			
5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.					-
6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.					
7	Acting in accordance with the ethical principles of the engineering profession,					
8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	x				
0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	X				

The Co Inform	urse's Lec ations	turer(s) aı	1d Contac	t		11	Ability to I and continu and emergi think inqui technologio Head of tasarim@	earn indepe uously, to a ing technol- sitively abc cal changes Departmer gazi.edu.t	endently dapt to new ogies and to out nt		x			
	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Pı O	rogram utcome	Program Outcome	Program Outcome	Program ciktisi 8	Pr Oi	ogram utcome	Program Outcome	Progr Outco	am me
	1	2	3	4	5		6	7	, inclusion o	9		10	11	
TOTAL	1	2	3	2						1		1	3	
Learnin g	1	1	1	1									1	
1														
Learnin		1	1	1								1	1	
g outcome 2														
Learnin			1							1			1	
g outcome 3														
Learnin														
g outcome 4														
Learnin g outcome 5														

COURSE DESCRIPTION FORMCourse Code and NameETM301 THERMODYNAMICSCourse Semester5Catalog ContentDeveloping the ability to understand and comprehend basic thermodynamic concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to identify, formulate and solve problemsTextbook10. Çengel, Y. ve Boles, M., Mühendislik Yaklaşımıyla Termodinamik, (Çe. T. Derbentli), McGraw-Hill, İst., 1996. 11. Çengel, Yunus A. Fundamentals of thermal-fluid science, McGraw- HillSupplementary Textbooks2. Öztürk, A. and Kılıç, A., Thermodynamics with Solved Problems, Çağlayan Kitabevi, 1998.Credit3 ECTSPrerequisites of the Course (No Prerequisites									
Course Code and Name	ETM301 THERMODYNAMICS								
Course Semester	5								
Catalog Content	Developing the ability to understand and comprehend basic thermodynamic concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to identify, formulate and solve problems								
Textbook	 10. Çengel, Y. ve Boles, M., Mühendislik Yaklaşımıyla Termodinamik, (Çe. T. Derbentli), McGraw-Hill, İst., 1996. 11. Çengel, Yunus A. Fundamentals of thermal-fluid science, McGraw- Hill 								
Supplementary Textbooks	 Öztürk, A. and Kılıç, A., Thermodynamics with Solved Problems, Çağlayan Kitabevi, 1998. 								
Credit	3 ECTS								
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements								
Type of the Course	Compulsory								
Instruction Language	Turkish								
Course Objectives	Understanding the engineering profession and ethics To develop the ability to define complex engineering problems and analyze them with the principles of thermodynamics. To learn solution approaches to engineering problems To develop the ability to produce solutions in terms of energy efficiency and sustainability using thermodynamic principles.								

Course Learning Outcomes	 To gain the ability to solve thermodynamic problems by mathematica and analytical methods To gain the ability to explain and apply the principles and laws of thermodynamics To gain the ability to transform thermodynamic topics into practica applications and adapt them to industrial problems. Develop the ability to describe and analyze the behavior of thermodynamic systems. To develop the ability to associate knowledge in the field of thermodynamics with current research and to produce innovative solutions 								
Instruction Methods	Face to	tace							
	1 1	Konular Basic concepts and properties. Equilibri Temperature. The ze	definitions. Di um state. State eroth law of th	mension and units. System e changes and cycles. Pressure. ermodynamics.					
	2	Pure matter and its p stages. Shape prope	properties. Pur	e matter and phase change s.					
Weekly Schedule	3	Ideal gas and equati and generalized grap first law of thermod	on of state. Re oh. Other equa vnamics	al gases. Compressibility factor tions of state. Introduction to th					
	4	First law of thermod Specific heat. Intern gases. Specific heat	lynamics (for a al energy, entl s of solids and	closed systems). Heat and work. halpy, specific heat of ideal liquids.					
	5	First law of thermoor mass. Conservation continuous flow	lynamics (for o of energy. Flo	open systems). Conservation of w work. Open systems with					
	6 Discontinuity in open systems. Steady state, s Second law of thermodynamics. Heat machin and heat pumps.								
	7	Reversible and irrev principles. Thermod	ersible proces	ses. Carnot cycle and its rature scale.					
	8	principle of entropy increase. tropy change of pure matter. m.							
	9	Entropy change of p Adiabatic efficienci solution.	berfect gases. Hes of some ma	Reversible continuous flow work chines. Exergy and second law					
	10	Second law solution with gas flow: Air s	of closed and tandard assum	open systems. Power cycles ptions.					
	11	Otto and Diesel cyc regeneration. Ideal j Rankine cycle. Idea	les. Brayton cy et propulsion l Rankine cycl	ycle. Brayton cycle with cycles. Steam power cycles: e with reheating, ideal					
	12	Refrigeration cycles Carnot cycle. Vapor systems. Gas refrige	Cooling mac compression compression	heration. hines and heat pumps. Reverse refrigeration cycle. Heat pump					
	13 14	Ideal gas mixtures.	Air-vapor mix	ture					
Teaching and Learning Methods	Weekly Weekly Reading	theoretical course here tutorial hours: 0 Activities: 2	ours: 3						
	Internet browsing, library work: 2 Designing and implementing materials: 3 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 2								
			Numbers	Total Weighting (%)					
	10 Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions. 11 Otto and Diesel cycles. Brayton cycle. Brayton cycle with regeneration. Ideal jet propulsion cycles. Steam power cycle Rankine cycle. Ideal Rankine cycle with reheating, ideal regenerative Rankine cycle. Cogeneration. 12 Refrigeration cycles: Cooling machines and heat pumps. Rec Carnot cycle. Vapor compression refrigeration cycle. Heat p systems. Gas refrigeration cycle. 13 Ideal gas mixtures. Air-vapor mixture. 14 Exercises. Weekly theoretical course hours: 3 Weekly tutorial hours: 0 Reading Activities: 2 Internet browsing, library work: 2 Designing and implementing materials: 3 Report preparing: 0 Preparation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 2 Midterm Exams 1 40 Assignment								

	Applic	ation									
	Projec	ts									
Assessment Criteria	Practic	ce									-
	Quiz		1			2	20				-
	Percen	t of In-term $-(0/2)$				(50				
	Studie	S (%)									
	Percen	tage of Final Exam				4	10				-
	to Tota	al Score (%)									-
	Attend	lance									
			Total Du			Duration			Tot: Peri	al od	
		Activity		Weeks ho			eklj ur)	y		Woi Loa	rk Id
	ours	14	4		3			42	2		
	Weekly	Tutorial Hours									
	Reading	g Tasks		5			2			10)
sessment Criteria orkload	Studies			6	,		2			12	2
	Materia	l Design and Implemen	1			3			3		
Workload	Report	Preparing									
W OI KIDAU	Prepari	ng a Presentation									
	Present	ations									
	Midtern	n Exam and Preperation	1 for	2			2			4	
	Einel E		- Ein -1	2			2			4	
	Final Ex	should be emphasized)	r Final		, 	-				-	
	Total W	Vorkland								75	
	Total W	Vorkload / 25							,	75/2	25
	Course	Credit (ECTS)								3	
	Course									5	
	No Program Outcomes						1	2	3	4	5
	1	ematics comput	s, scien er-aide	ice, ed				X			
		computing and spec	ineering areas; e effectively in								
		solving complex en	gineering	g proble	ems.	1					
	2	Ability to identify, f	ormulate	ite and analyse					x		
Contribution Level Between Course Learning		complex engineerin	g problei thematic	ems using knowledge							
Outcomes and Program Outcomes		and taking into acco	ount the U	JN Sus							
	3	Ability to generate of	creative s	solution	s to co	mplex				x	
		engineering problem	ns to mee	et curre	nt and	future					
		devices or products	under re	alistic c	onstra	, ints					
		and conditions.									
	4	Ability to select and	use appro	opriate	technio d	ques,		X			
		information technolo	gy tools,	includ	ing						
		estimation and mode	lling, for	r the analysis and							
		solution of complex of recognising their lim	engineer	ing prol	olems,						
	5	Ability to use research	h metho	ds, incl	uding						x
		literature search, des	igning ar	nd cond	ucting						
		experiments, collecti	ng data,	analysii gate cor	ng and						
		engineering problem	s.	Sail CO	прієх						
	6	Knowledge of the eff	fects of e	ngineer	ring pr	actices					
		on society, health and	d safety,	econon	1y, n tha						
	Value 1 Percent of In-term Studies (%) Percentage of Final Exam to Total Score (%) Percentage of Final Exam to Total Score (%) Attendance Percentage of Final Exam to Total Score (%) Percentage of Final Exam to Total Score (%) Weekly Theoretical Course Hours 14 Weekly Tutorial Hours Percentage of Material Design and Implementation 1 Reading Tasks 5 Studies 6 Material Design and Implementation 1 Report Preparing Percentations Preparing a Presentation 1 Preparing a Presentation for 2 Final Exam and Preperation for Final 2 1 Other (should be emphasized) 1 Total Workload 2 1 In-depth knowledge of mathematics, science, basic engineering problems. 1 1 In-depth knowledge of mathematics, science, ablity to identify, formulate and analyse complex engineering problems. 2 2 Ability to identify, formulate and analyse complex engineering problems. 3 3 Ability to generate creative solutions to comple engineering problems to meet current and futur needs; design omplex systems, processes, devices or products under realistic constraints and conditions.	ment									
		Goals; awareness of	the legal	conseq	uences	s of					

	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.		x	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	X		
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.			
The Course's Lecturer(s) and Contact Informations	Prof vozo	f. Dr. Veysel Özdemir demir@gazi.edu.tr			

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4	3	4	2	5		4			1	
Learnin	1	1	1		1		1				
g outcome 1											
Learnin	1	1	1	1	1		1				
g outcome 2											
Learnin	1	1	1	1	1		1				
g outcome 3											
Learnin	1		1		1		1				
g outcome 4											
Learnin					1					1	
g outcome 5											

COURSE DESCRIPTION FORM							
Course Code and Name	ETM302 FLUID MECHANICS						
Course Semester	6						
Catalog Content	Professional and ethical responsibility Ability to use modern engineering methods Teamwork and leadership skills. Ability to communicate verbally and in writing Ability to identify, formulate and solve problems Ability to design, implement and design experiments						

Textbook	 Akışkanlar Mekaniği (Temelleri Ve Uygulamalari), Y. A. Çengel, J.M. Cimbala, 1. Baskı, <u>Güven</u> Bilimsel, 2008 Munson, B.R., Young, D.F., Okiishi, T.H. and Huebsch, W.W., Fundemantals of Fluid Mechanics, Wiley Pub. 2009. White, F.M., Fluid Mechanics, McGraw-Hill Pub., Int. Ed., 2011. 							
Supplementary Textbooks	 Akışkanlar Mekaniği ve Hidrolik Problemleri, C. Ilgaz, M.E.Karahar A.Bulu, Çağlayan Kitabevi, 1. Baskı, 1993 Akışkanlar Mekaniği ve Hidrolik, RV.Giles, Güven Kitabevi, 1980 							
Credit	3 ECTS							
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirem	No Prerequisites %70 Attendance Requirements						
Type of the Course	Elective							
Instruction Language	Turkish							
Course Objectives	Understanding the engineer To gain the ability to comp properties of fluids. To learn solution approach To have knowledge of basi	ring professior rehend and an es to engineeri c design and e	and ethics alyze static and dynamic ng problems ngineering issues					
Course Learning Outcomes	 Mastering the basic topics of fluid mechanics Develop the ability to analyze complex problems related to fluid flows. Gain the ability to understand and apply kinematic properties of fluids Acting in accordance with the ethical principles of the engineering profession, gaining awareness about ethical responsibilities To develop the ability to follow research in the field of fluid mechanics and to produce innovative solutions. 							
Instruction Methods	Face to face							
Weekly Schedule	HaftaKonular1Introduction2Fluid statics3Basic fluid dynamic4Fluid kinematics5Controllable volume6Differential analysis7Dimensional analysis8Viscous flow in pip9Flow over immersed10Applications11Flow in open chann12Compressible flow13Applications14Turbo machines	es - Bernolli eq e analysis s of fluid flow is, simulation es d objects el	uation and modeling					
Teaching and Learning Methods	Weekly theoretical course hours: 3 Weekly tutorial hours: 0 Reading Activities: 5 Internet browsing, library work: 5 Designing and implementing materials: 5 Report preparing: 2 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 4 Einal Exam and Preparation for Einal Exam: 5							
Assessment Criteria	Midterm Exams Assignment Application Projects	Numbers	Total Weighting (%) 40 20					
Practice								

	Quiz										
	Percen	t of In-term				6	0				
	Studies	s (%)									
	Percen	tage of Final Exam	Exam			4	-0				
	to Tota	l Score (%)									
	Attend	ance									
				Total		Dur	otio	n	Г	Fota	al
			Numb	er of	(we	ekly	y I	P V	eria Nor	od •k	
					Weeks		hour)			Loa	d
	Weekly	Theoretical Course Ho	ours	14		-	3			42	
	Weekly	Tutorial Hours									
	Reading	Tasks		1		-	5			5	
	Studies			2			5			10	
	Material	Design and Implemen	tation	1			5			5	
Workload	Report I	Preparing		2			2			4	
	Preparin	g a Presentation									
	Presenta	tions									
	Midtern	Exam and Preperation	1			ł -			4		
	Final Ex	am and Preperation for	1	1 5			3				
	Other (s	should be emphasized)						7			
	Total W	orkload		-			-			13	5
	Total W	Orkload / 25							3		.5
	Course									5	
	No				1	2	3	4	5		
	1	In-depth knowledge	ematics,	, scien	ce,				x		
		basic engineering concepts, con			er-aide	d					
		ability to use this knowledge			vely in	L					
		solving complex engineerin			ms.						
	2	Ability to identify, f	ormulate	e and analyse						x	
Contribution Level Between Course Learning		complex engineerin	g probler	ns using	g knov	vledge					
Outcomes and Program Outcomes		and taking into acco	unt the U	und engineering, UN Sustainable							
	3	Ability to generate of	reative s	solutions to complex							x
		engineering problems to meet current and									
		needs; design compl devices or products	lex syster under res	ms, proc alistic co	cesses,	ints					
		and conditions.	under ret		onstru	into					
	4	Ability to select and	use appro	opriate t	echnic	ques,	X				
		information technolo	n enginee gy tools,	includi	a ng						
		estimation and model	lling, for	the ana	lysis a	nd					
		solution of complex or recognising their limit	engineeri	ing prob	olems,						
	recognising their limitations. 5 A bility to use research method		ds inch	Iding					v		
	5 Ability to use research method literature search, designing an			id condu	ucting					Δ	
		experiments, collectin	ng data, a	analysin	ig and						
		engineering problems	5 mvestiş 5.	gate con	npiex						
	6	Knowledge of the eff	ects of e	ngineer	ing pra	actices	x		\dashv		
		on society, health and	l safety,	econom	y,						
		framework of the UN	Sustain	it within able De	ı tne velopr	nent					
		Goals; awareness of	the legal	consequ	uences	of					

	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.	X		
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	X		
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.			
The Course's Lecturer(s) and Contact Informations	Prof. vozd	Dr. Veysel Özdemir emir@gazi.edu.tr			

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4	4	5	1	4	1	1			1	
Learnin g outcome 1	1	1	1	1	1						
Learnin g outcome 2	1	1	1		1						
Learnin g outcome 3	1	1	1		1						
Learnin g outcome 4		1	1			1	1				
Learnin g outcome 5	1		1		1					1	

Course Description Form						
Course Code and Name	ETM303 MACHINE ELEMENT 1					
Course Semester	5					
Catalog Content	Engineering Basic concepts Principal Stresses Material Behaviors Loading types Connectors Riveted Joints Welded Joints Bolted Joints					

 M. Tolga OZKAN Makine Elemanlari Ders notlari, 2024 Mustafa Akkurt, Makina Elemanlari Birsen Yayınevi, 2018. J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition McGraw Hill, 2014. Robert Norton Machine Design: An Integrated Approach, 6th Edition Pearson, 2019. 							
 Fatih C. Ba Örnekleri, Atila Boza 	abalık, Kadir Çavdar, Makine Elemanları ve Konstrüksiyon Dora Yayınları, 2021. cı, Makina Elemanları, Literatür Yayıncılık, 2023.						
B ECTS							
Attendance Re	equirements 70%						
Compulsory							
Turkish							
Learning the field of design engineering activity Learning solution approaches to engineering problems Having knowledge of basic design and engineering issues By explaining the calculation approaches of basic Machine Elements to t students, it is aimed to enable them to learn and synthesize which machin elements will be used in the design process and the engineering approach required for the design of these machine elements.							
 The purpose of the courses to be taken in design engineering education and general concepts are learned. Knows what engineering skills a design engineer should have Learns engineering calculation approaches Knows the Machine Elements and knows the places where they will be used. Place of use of Machine Elements - gain calculation and design ability according to working conditions 							
Face to face							
1. Week 2. Week 3. Week 4. Week 5. Week 6. Week 7. Week 8. Week 10. Week 11. Week 12. Week 13. Week 14. Week	Basic concepts; Basic Mathematics and Physics approachesPrincipal stressesHooke's law; Material approach and behaviorMaterial strengthStress hypothesis, static, dynamic loading typesRiveted JointsWelded JointsWelded JointsWelded JointsWelded JointsBolted JointsBolted JointsBolted Joints						
	 Mustafa A J. E. Shigle McGraw H Robert Noi Pearson, 20 Fatih C. Ba Örnekleri, Atila Boza ECTS Attendance Ref Compulsory Furkish Learning the f Learning solut Having knowl By explaining tudents, it is a elements will equired for the The purpose Ind general co Knows the Ised. Place of use Knows the Ised. Place of use Cording to w Face to face Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week Week 						

Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 3 Weekly tutorial hours: 0 Reading Activities: 3 Internet browsing, library work:1 Designing and implementing material Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Final Exam and Preparation for Final	s: 1 Exam: 5 Exam: 5	
Assessment Criteria	Midterm Exams Assignment Application Projects Practice Quiz Percent of In-term Studies	Numbers 1 1 1	Total Weighting (%) 40 20 60
	(%) Percentage of Final Exam to Total Score (%) Attendance		40

		Activity	Total Numbe r of Weeks	Duration (weekly hour)			T Pe W Lo	otal riod ork ad	
	Weekly Hours	Theoretical Course	14	3			4	42	
	Weekly	Tutorial Hours							
	Reading	g Tasks	4	3				12	
	Studies		5	1				5	
	Materia Implem	l Design and entation	6		1			6	
Workload	Report l	Preparing							
	Preparir	ng a Presentation							
	Presenta	ations							
	Midtern Prepera Exam	n Exam and tion for Midterm	1	5			5		
	Final Ex for Fina	xam and Preperation l Exam	1	5			5		
	Other (should be emphasized)								
	Total W	orkload	-	-			′	75	
	Total W	/orkload / 25					75	5/25	
	Course	Credit (ECTS)				i		3	
	No	Program Outcom	ies	1	2	3	4	5	
	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas: abi	f basic computer- specific lity to use					x	
Contribution Level Between Course Learning Outcomes and Program Outcomes		this knowledge effecti solving complex engin problems.	vely in neering						

-					
2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals. Ability to generate creative			X	x
	solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and				
4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.			X	
5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		X		
6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.				
7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				
8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).	X			
9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).				
10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				

	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.
The Course's Lecturer(s) and	Prof. Dr. Murat Tolga ÖZKAN
Contact Informations	tozkan@gazi.edu.tr

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							
Learning outcome 4	1	1									
Learning outcome 5	1	1									

	Course Description Form
Course Code and Name	ETM304 MACHINE ELEMENT 2
Course Semester	6
Catalog Content	Engineering Basic concepts, Principal Stresses, Material Behaviors, Loading types, Power and Motion transmission Shaft Design Belt Pulley Mechanisms Gear Design Spur wheel Helical Gear Wheel Bevel Gear Wheel Bevel Gear Wheel Bearing Design
Textbook	 M. Tolga ÖZKAN Makine Elemanları Ders notları, 2024 Mustafa Akkurt, Makina Elemanları Birsen Yayınevi, 2018. J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition, McGraw Hill, 2014.
Supplementary Textbooks	 Robert Norton, Design of Machinery with Student Resource DVDMcGraw-Hill Education, 2011. Fatih C. Babalık, Kadir Çavdar, Makine Elemanları ve Konstrüksiyon Örnekleri, Dora Yayınları, 2021. Atila Bozacı, Makina Elemanları, Literatür Yayıncılık, 2023.
Credit	4 ECTS
Prerequisites of the Course (Attendance Requirements 70%
Type of the Course	Compulsory

Instruction Language	Turkish							
Course Objectives	Learning the Learning solu Having know By explaining students, it is elements will required for th	field of design engineer tion approaches to engi ledge of basic design ar the calculation approa aimed to enable them to be used in the design p ne design of these mach	ing activity ineering problem ad engineering ches of basic l o learn and syn rocess and the nine elements.	ems ; issues Machine Elements to nthesize which mach engineering approad	o the tine ches			
Course Learning Outcomes	 Ability to lataken in desig Having eng Ability to lataken Ability to lataken Being able Use of Macacording to value 	earn the purpose and ge n engineering education ineering skills earn engineering calcul to recognize and use M chine Elements - gaining vorking conditions	eneral concept n ation approacl lachine Eleme g the ability to	s of the courses to be nes nts o calculate and design	e n			
Instruction Methods	Face to face							
Weekly Schedule	1. WeekGeneral concepts2. WeekPower and movement3. WeekDesign of shafts I4. WeekDesign of shafts II5. WeekPowertrains6. WeekBelt pulley design7. WeekSpur gear design I8. WeekSpur gear design II9. WeekHelical gear design10. WeekBevel gear design II11. WeekBevel gear design II12. WeekWorm and gear design13. WeekBearing design II14. WeekBearing design II							
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: (Preparation of Final Exam and	ical course hours: 3 hours: 0 ties: 1 ng, library work: 1 implementing materials ng: 0 sentation: 0) Midterm and Midterm 1 d Preparation for Final 1	s: 2 Exam: 10 Exam: 10					
Assessment Criteria	Midterm Exan Assignment Application Projects Practice Quiz Percent of In-t (%) Percentage of Score (%) Attendance	erm Studies Final Exam to Total	Numbers 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Total Weighting (%) 40 20 60 40				

		Activity	Total Numbe r of Weeks	Dur (wee hou	ation ekly r)	l	T Pe W Lo	otal riod ork ad
	Weekly Hours	Theoretical Course	14		3		4	42
	Weekly	Tutorial Hours						
	Reading	g Tasks	2		1		2	
	Studies		12				12	
	Materia Implem	l Design and entation	12	2				24
Workload	Report	Preparing						
	Prepari	ng a Presentation						
	Present	ations	1		10			10
	Prepera Exam	n Exam and tion for Midterm	I		10			10
	Final Ex for Fina	xam and Preperation al Exam	1		10			10
	Other (emphas	should be ized)						
	Total W	/orkload	-		-		1	00
	Total W	/orkload / 25					10	0/25
	Course	Credit (ECTS)						4
	No	Program Outcom	nes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1 In-depth knowledge of mathematics, science engineering concepts aided computing and engineering areas; ab this knowledge effect solving complex engineering		f basic computer- specific lity to use ively in neering					x
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developn	rmulate using cience, neering, nt the UN nent Goals.					x
		Ability to generate cro solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet eds; design cesses, nder nd			x		
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl- estimation and modell the analysis and soluti complex engineering recognising their limit	nse s, mation uding ling, for ion of problems, tations.			x		

	5 A in da ey au re ei 6 K	bility to use research methods, neluding literature search, esigning and conducting xperiments, collecting data, nalysing and interpreting esults, to investigate complex ngineering problems.		X		
	ei ha su W S av co so	ngineering practices on society, ealth and safety, economy, ustainability and environment <i>v</i> ithin the framework of the UN ustainable Development Goals; wareness of the legal onsequences of engineering olutions.				
	7 A et av re na ai	acting in accordance with the thical principles of the ngineering profession, wareness of ethical esponsibilities; awareness of on-discrimination, impartiality nd embracing diversity.				
	8 A te in in fa	bility to work effectively as a eam member or leader both ndividually and within nterdisciplinary teams (face-to- ace, distance or hybrid).	x			
	9 A et bo ta di au la	bility to communicate ffectively on technical issues, oth orally and in writing, aking into account the various ifferences of the target udience (e.g. education, anguage, profession).				
	10 K pr m fe	nowledge of business life ractices such as project nanagement and economic easibility analysis; awareness f entrepreneurship and				
	11 A an no an te	bility to learn independently nd continuously, to adapt to ew and emerging technologies nd to think inquisitively about echnological changes.				
The Course's Lecturer(s) and Contact Informations	Prof. 1 tozkar	Dr. Murat Tolga ÖZKAN n@gazi.edu.tr				

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							

Learning outcome 4	1	1					
Learning outcome 5	1	1					

COURSE I	DESCRIPTION FORM
Course Code and Name	ETM305 PRODUCT DESIGN AND DEVELOPMENT
Course Semester	5
Catalog Content	Ability to use modern engineering tools Teamwork and leadership skills Ability to design and implement experiments Ability to identify problems and make designs Sustainable designs Developing innovative products
Textbook	 Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006. Morris, R., Fundamentals of Product Design, AVA Pub., 2009.
Supplementary Textbooks	3. Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.
Credit	5 ECTS
Prerequisites of the Course	No Prerequisites Attendance Requirements %70
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Generating innovative design ideas Solving and implementing a complex engineering project Using computer programs effectively Developing designs suitable for the target audience Improving teamwork ability Creating and implementing a design project
Course Learning Outcomes	 Students taking this course can prepare sketches, three-dimensional model creation, structural analyses, technical drawings and prototypes required in the process of developing a new product. Students taking this course can identify design problems and develop solution suggestions. Students taking this course can create a detailed report including research, design process, user needs analysis, analysis processes and final design recommendations. Students taking this course gain skills in working as a team by communicating effectively and collaborating. They gain the ability to effectively present the designed product or system
Instruction Methods	Face to face
Weekly Schedule	WeekSubjects1Introduction to the Product Design Process2Product Design Specifications3Planning and Scheduling4Conceptual Design5Detail Design6Detail Design7Presentation of project8Design for Manufacturing (DFM)
	9 Design for Assembly (DFA) 10 Design for Reliability 11 Human Factors in Design

	12	Model and Prototyp	ing										
	13 Design for Environment and Sustainability 14 Presentation of project												
	14 Waaldu	Presentation of proje	ect										
	Weekly	theoretical course h	ours: 2										
	Reading	Activities: 1											
Teaching and Learning Methods	Internet	browsing, library w	ork 2										
	Designin	ng and implementing	g materials	: 2									
	Report p	reparing: 2											
	Preparin	g a Presentation: 1											
	Preparat	ion of Midterm and	Midterm F	Exam:									
	Final Ex	am and Preparation	for Final E	Exam: 5									
			Number	s T	otal W	/eigh	tin	Ig					
					(0	%)		8					
	Midtern	n Exams											
	Assignt	nent											
	Projects	uion	1		6	50							
Assessment Criteria	Practice	,	1		t								
	Ouiz	·											
	X												
	Percent	of In-term											
	Studies	(%)			6	50							
	Percent	age of Final Exam											
	to Total Score (%)					40							
	Attenda	ince											
			Total	Dura	atio		Т	otal	1				
				Number	n			Pe	rio	d			
		· · · · · ·					w	0.1					
		Activity		of	(wee	kly		Ľ	ore nad	ζ Ι			
		Activity		of Weeks	(wee hou	kly r)		L	oad	ζ Ι			
	Weekly 1	Activity	ours	of Weeks 14	(wee hou 2	kly ir)		2 2	ork oad 28	ζ Ι			
	Weekly T Weekly T	Activity Theoretical Course Ho Futorial Hours	ours	of Weeks 14 14	(wee hou 2 2	kly ir)		2 2 2	ori oad 28 28	ζ Ι			
	Weekly T Weekly T Reading	Activity Fheoretical Course Ho Futorial Hours Tasks	ours	of Weeks 14 14 5	(wee hou 2 2 1	kly ir)		2 2 2	014 0ad 28 28 5				
	Weekly T Weekly T Reading Studies	Activity Fheoretical Course Ho Futorial Hours Tasks	ours	of Weeks 14 14 5 5	(wee hou 2 2 1 2	kly ır)		2 2 2 1	28 28 5 10				
Workload	Weekly 1 Weekly 1 Reading Studies Material	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen	ours	of Weeks 14 14 5 5 12	(wee hou 2 2 1 2 2 2 2 2	kly ır)			28 28 5 10 24				
Workload	Weekly T Weekly T Reading Studies Material Report P	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing	ours	of Weeks 14 5 5 12 8	(wee hou 2 2 1 2 2 2 2 2 2	kly ir)		22 22 11 22 11	orad 28 28 5 10 24 16				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation	ours	of Weeks 14 5 5 12 8 6	(wee hou 2 2 1 2 2 2 2 2 1	kly ir)		2 2 2 1 2 1	orad 28 28 5 10 24 16 6				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions	ours	of Weeks 14 5 5 12 8 6 3	(wee hou 2 2 1 2 2 2 2 2 2 1 1	kly ir)			orad 28 28 5 10 24 16 6 3				
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation	ntation	of Weeks 14 5 5 12 8 6 3	(wee hou 2 2 1 2 2 2 2 2 1 1 1	kly ir)			orad 28 28 5 10 24 16 6 3				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for am and Preperation for	n for r Final	of Weeks 14 14 5 5 12 8 6 3 1	(wee hou 2 2 1 2 2 2 2 2 1 1 1 5	kly ir)			orad 28 28 5 10 24 16 6 3 5				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (s)	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized)	ntation	of Weeks 14 14 5 5 12 8 6 3 1	(wee hou 2 2 1 2 2 2 2 2 2 1 1 1 5	kly r)			014 00ad 28 28 5 10 24 16 6 3 5				
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (st	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload	n for r Final	of Weeks 14 14 5 12 8 6 3	(wee hou 2 2 2 1 2 2 2 2 1 1 1 5 5	kly ır)			original 28 28 5 10 24 16 6 3 5 225				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (sl Total Wo	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implement reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25	n for r Final	of Weeks 14 14 5 5 12 8 6 3 1 -	(wee hou 2 2 1 2 2 2 2 2 2 2 1 1 1 5 5 -	kly (r)			ord 28 28 5 10 24 16 6 3 5 225 5				
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25 Gredit (ECTS)	n for r Final	of Weeks 14 14 5 12 8 6 3	(wee hou 2 2 1 2 2 2 2 1 1 1 5 5	kly (r)			oad 28 28 5 10 24 16 6 3 5 25 5 5 5 5				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25 Fredit (ECTS) Program Outcor	n for r Final	of Weeks 14 14 5 5 12 8 6 3 1 -	(wee hou 2 2 1 2 2 2 2 2 2 1 1 1 5 5 -				oad 28 28 5 10 24 16 6 3 5 25 5 5 5				
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (sl Total Wo Total Wo Course C No	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implement reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25 Fredit (ECTS) Program Outcor	ntation	of Weeks 14 14 5 5 5 12 8 6 3 -	(wee hou 2 2 1 2 2 2 2 2 2 1 1 1 5 5		2		oad 28 28 5 10 24 16 6 3 5 25 5 5 4	5			
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25 Fredit (ECTS) Program Outcor In-depth knowledge	n for r Final mes	of Weeks 14 14 5 5 12 8 6 3 1 1 -	(wee hou 2 2 1 2 2 2 2 1 1 5 -		2	1 2 2 2 2 2 2 2 2 2 2 2 1 1 2 2 1 1 1 2 2 1 1 1 2 2 1 1 1 2 1	oad 28 28 5 10 24 16 6 3 5 5 5 4	5			
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Theoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering co	n for r Final mes	of Weeks 14 14 5 5 12 8 6 3 - -	(wee hou 2 2 2 1 2 2 2 2 2 2 1 1 1 5 5 -		2	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	oad 28 28 5 10 24 16 6 3 5 25 5 4				
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation im and Preperation for hould be emphasized) orkload orkload / 25 Gredit (ECTS) Program Outcor In-depth knowledge basic engineering cc computing and spec ability to use this left	ntation ntation n for r Final nes of mathem oncepts, con ific enginee	of Weeks 14 14 5 5 12 8 6 3 1 1 -	(wee hou 2 2 2 1 2 2 2 2 2 2 2 2 2 2 1 1 1 5 5 -		2	1 2 2 2 2 2 2 2 2 2 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 1 2 2 1	0ad 28 28 5 10 24 16 6 3 5 25 5 4	5			
Workload	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex ensity	n for r Final nes of mathem oncepts, con iffic enginee nowledge ef gineering p	of Weeks 14 14 5 5 5 12 8 6 3 - 1 - - - - - - - - - - - - - - - - -	(wee hou 2 2 2 1 2 2 2 2 1 1 5 5 		2	1 2 2 2 2 2 2 2 2 2 2 2 1 1 2 2 1 1 1 2 2 3 3 x	0ad 28 28 5 10 24 16 6 3 5 5 5 5 4	5			
Workload	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload rkload In-depth knowledge basic engineering cc computing and spec ability to use this kn solving complex eng Ability to identify, f	n for r Final nes of mathem oncepts, con ific enginee nowledge ef gineering pr	of Weeks 14 14 5 5 5 12 8 6 3 - 1 - - - - - - - - - - - - - - - - -	(wee hou 2 2 2 1 2 2 2 2 2 2 1 1 1 5 5 -		2	1 3 x	28 28 28 5 10 24 16 6 3 5 25 5 4	5			
Workload Contribution Level Between Course Learning	Weekly T Weekly T Reading Studies Material Report Pr Preparing Presentat Midterm Final Exa Other (sl Total Wo Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation am and Preperation for hould be emphasized) orkload orkload / 25 Credit (ECTS) Program Outcor In-depth knowledge basic engineering cc computing and spec ability to use this kn solving complex eng Ability to identify, f complex engineering	ntation n for r Final nes of mathem oncepts, con ific enginee nowledge ef gineering pr formulate an g problems	of Weeks 14 14 5 5 12 8 6 3 1 1 - - - - - - - - - - - - - - - - -	(wee hou 2) 2 2) 1 2 2 2 2 2 1 1 1 1 5 5 		2	1 1 1 3 x x	28 28 5 10 24 16 6 3 5 5 5 5 5 4	5			
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes	Weekly T Weekly T Reading Studies Material Report P Preparing Presentat Midterm Final Exa Other (sl Total We Course C No 1	Activity Fheoretical Course Ho Futorial Hours Tasks Design and Implemen reparing g a Presentation ions Exam and Preperation for hould be emphasized) orkload orkload orkload fundepth knowledge basic engineering cc computing and spec ability to use this kn solving complex engi Ability to identify, f complex engineering of basic science, ma and taking into acces	n for r Final mes of mathem procepts, con ific enginee nowledge ef gineering pro- formulate an g problems thematics a	of Weeks 14 14 5 5 5 12 8 6 3 1 1 - - - - - - - - - - - - - - - - -	(wee hou 2 2 1 2 2 2 2 2 1 1 1 5 5 		2	2 2 2 1 1 2 2 1 1 1 1 1 1 1 3 x x	28 28 28 5 10 24 16 6 3 5 5 5 5 4	5			

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	X	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		x
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		x
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions		
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.		
	8	Ability to work effectively as a team member or leader both individually and within	x	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		X
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	x	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	X	
The Course's Lecturer(s) and Contact Informations		Dr. Nurullah Yüksel nurullahyuksel@gazi.edu.tr		

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	3	3	3	4	4			3	4	3	3
Learning outcome 1	1	1	1	1	1			1	1	1	1
Learning outcome 2	1	1	1	1	1				1		1
Learning outcome 3	1	1	1	1	1				1		
Learning outcome 4								1	1	1	1
Learning outcome 5				1	1			1		1	

COURSE DESCRIPTION FORM							
Course Code and Name	ETM306 APPLIED PRODUCT ANS SYSTEM DESIGN						

Course Semester	6
Catalog Content	Ability to use modern engineering tools Teamwork and leadership skills Ability to design and implement experiments Ability to identify problems and make designs Sustainable designs Developing innovative products
Textbook	 Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006. Morris, R., Fundamentals of Product Design, AVA Pub., 2009.
Supplementary Textbooks	4. Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.
Credit	5 ECTS
Prerequisites of the Course	No Prerequisites Attendance Requirements %70
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Generating innovative design ideas Solving and implementing a complex engineering project Using computer programs effectively Developing designs suitable for the target audience Improving teamwork ability Creating and implementing a design project
Course Learning Outcomes	 Students taking this course can prepare sketches, three-dimensional model creation, structural analyses, technical drawings and prototypes required in the process of developing a new product. Students taking this course can identify design problems and develop solution suggestions. Students taking this course can create a detailed report including research, design process, user needs analysis, analysis processes and final design recommendations. Students taking this course gain skills in working as a team by communicating effectively and collaborating. They gain the ability to effectively present the designed product or system
Instruction Methods	Face to face
Weekly Schedule	WeekSubjects1Project introduction and discussion2Idea generation3Needs analysis and evaluation4Market and Literature research5concept creation6concept development7Part modeling using CAD tools8System modeling using CAD tools9Simulation and analysis using CAE tools10Creating technical documentation11Prototyping12Prototyping and testing13Create a project report14Layout and presentation preparation techniques

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 2 Reading Activities: 1 Internet browsing, library work 2 Designing and implementing materials: 2 Report preparing: 2 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: Final Exam and Preparation for Final Exam: 5									
	Numbers Total W									
	Midter	m Exams								
	Assign	ment								
	Project	auon	1		6	50				
Assessment Criteria	Practic	e	1		t	0				
	Quiz	•								
	Percent of In-term Studies (%)				6	0				
	Percentage of Final Exam to Total Score (%)			40						
	Attend	ance								
		Activity	Total Number of Weeks	al Duratio ber n f (weekly eks hour)		Tota Perio Wor Loa		tal iod ork ad	1	
	Weekly	Theoretical Course Ho	14	2		28				
	Weekly	Tutorial Hours	14	2		28				
	Reading	Tasks	5	1		5				
	Studies			5	2		10		0	
Workload	Material	al Design and Implementation		12	2		24		4	
W OFKIOAU	Report F	Preparing		8	2	2		16		
	Preparin	g a Presentation		6	1	1		6		
	Presenta	tions		3	1				3	
	Midterm	Exam and Preperation	1 for					+		
	Final Ex	am and Preperation for	r Final	1	5		5			
	Other (s	should be emphasized)	1 11101		+		+	-		
	Total W	orkload					125		25	
	Total W	orkload / 25		+		5				
	Course (Credit (ECTS)				+		5		
	No Program Outcomes				1	2	3	4	5	
	1 In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problems.						x			
Contribution Level Between Course Learning Outcomes and Program Outcomes	2 Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable X							X		

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	x		
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		X	
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		X	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	X		
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x	
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	x		
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	x		
urse's Lecturer(s) and Contact		Dr. Nurullah Yüksel	 	<u> </u>	

The Course's Lecturer(s) and Contact Informations

Dr. Nurulian Yuksel

nurullahyuksel@gazi.edu.tr

	Program	Program	Program	Program	Program	Program	Program	Progra	Program	Program	Program
	Outcome	Outcome	Outcome	Outcome	Outcome	Outcome	Outcome	m çıktısı	Outcome	Outcome1	Outcome1
	1	2	3	4	5	6	7	8	9	0	1
TOTAL	3	3	3	4	4			3	4	3	3
Learnin	1	1	1	1	1			1	1	1	1
g outcome 1											
Learnin	1	1	1	1	1				1		1
g outcome 2											
Learnin	1	1	1	1	1				1		
g outcome 3											
Learnin								1	1	1	1
g outcome 4											

Learnin		1	1		1	1	
g							
outcome 5							

Course Description Form							
Course Code and Name	ETM307 COMPUTER PROGRAMMING						
Course Semester	5						
Catalog Content	The understanding of the concept of matrices, the history of programming languages, their applications, and the working environment. Understanding of data types and variables. Understanding basic operations, basic commands, and functions. Ability to create iterative processes and loops. Ability to use decision (conditional) statements. Programming skills with MATLAB.						
Textbook	 Attaway, Dorothy C. MATLAB: A Practical Introduction to Programming and Problem Solving. Butterworth-Heinemann, 2013. Dukkipati, Rao V. MATLAB: An Introduction with Applications. New Age International, 2008. 						
Supplementary Textbooks	 Mueller, John Paul, and Jim Sizemore. MATLAB for Dummies. John Wiley & Sons, 2021. 						
Credit	3 ECTS						
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Learning computer programming concepts through applications in a programming language.						
Course Learning Outcomes	 Learning computer programming topics and methods. Acquiring comprehensive and fundamental coding skills. 						
Instruction Methods	Face to face						

	1. Week Introduction								
	2. Week	Concept of Matrices							
	3. Week	MATLAB Programm	ing Environm	ent					
	4. Week	Data Types - 1							
	5. Week	Data Types - 2							
	6. Week	Variables							
Weekly Schedule	7. Week	Basic and Arithmetic Operations							
	8. Week	Basic Commands and Functions							
	9. Week	Iterative Processes an	d Loops - 1						
	10. Week	Iterative Processes an	d Loops - 2						
	11. Week	Decision (Conditiona	l) Statements						
	12. Week	Using Conditional St	atements with	Loops					
	13. Week	Programming with M	ATLAB						
	14. Week	Creating Function Fil	es						
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 0 Internet browsing, library work: 2 Designing and implementing materials: 3 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 7 Final Exam and Preparation for Final Exam: 3								
			Numbers	Total Weighting (%)					
	Midterm Exan	ns	1	60					
	Assignment								
	Application								
Assessment Criteria	Projects								
	Practice								
	Percent of In-1	term Studies		60					
	(%)								
	Percentage of Score (%)	Final Exam to Total		40					
	Attendance								

		Activity	Total Numbe r of Weeks	Dur (we hou	ation ekly r)	l	T Pe W Lo	otal riod ork oad
	Weekly Hours	14	2		28			
	Weekly	Tutorial Hours	14	1				14
	Reading	g Tasks						
	Studies		7	2				14
Workload	Materia Implem	l Design and entation	2		3			6
	Bronori	Preparing						
	Present	ations						
	Midterr Prepera	n Exam and tion for Midterm	1		7			7
	Final E for Fina	xam and Preperation l Exam	2		3			6
	Other (emphas	should be ized)						
	Total W	/orkload	-	-			75/25	
	Total Workload / 25						/.	3
	Course	Program Outcom	nes					
	No			1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes		In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in neering	x e				
	2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals.						
	3	Ability to generate cro solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet ds; design cesses, nder nd		X			
	4	Ability to select and u appropriate technique resources and modern engineering and inforn technology tools, incl estimation and modell the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.		x			
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.						
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		health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.						
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.						
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).	X					
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).						
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and						
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		X				
The Course's Lecturer(s) and Contact Informations	Prof isahi	CDr. İsmail Şahin in@gazi.edu.tr						

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	2		2	2				1			2
Learning outcome 1	1		1	1							1
Learning outcome 2	1		1	1				1			1

Course Description Form					
Course Code and Name	ETM308 CREATIVITY AND INNOVATION				

Course Semester	6
Catalog Content	Introduction, Creativity and innovation, Innovative and creative designs, Creative thinking techniques, Problem solving approaches, Introduction, history and philosophy of TRIZ, The history and description of TRIZ (TIPS), 40 principles and their use in design, The contradiction matrix and its use in design, The other TRIZ tools (material field analysis), Design applications of TRIZ, Examination of term course projects.
Textbook	 Goldenber, J. and Mazarsky, D., Creativity in Product Innovation, Cambridge Univ. Press, Int. Ed., 2002. Altshuller, G., 40 Principles: TRIZ Keys to Technical Innovation, TrizTools, V.1, Tech. Innovation Center, Worcester-MA, USA, 2005.
Supplementary Textbooks	 Niku, S.B., Creative Design of Products and Sysetms, John Wiley & Sons, Inc., Int. Ed., 2009. Le Masson, Pascal, Benoit Weil, and Armand Hatchuel. Strategic management of innovation and design. Cambridge Univ. Press, 2010.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning about creativity and innovation Learning creative thinking techniques Getting to know problem solving approaches Learning the TRIZ approach, contradiction matrix and 40 solution principles Getting to know other TRIZ tools Gain the ability to solve design problems using TRIZ
Course Learning Outcomes	 They learn different creative thinking techniques and the ability to apply these techniques to real world problems Ability to develop creative and innovative approaches to solve complex problems Ability to apply problem solving approaches The ability to look at problems from different perspectives, think flexibly and take risks Ability to learn leadership and communication strategies that support creativity in business environments and apply these strategies in their future careers

	1. Week	Introduction						
	2. Week	Creativity and innova	tion					
	3. Week	Innovation types						
	4. Week	Innovative and creative	Innovative and creative designs					
	5. Week	Creative thinking techniques						
	6. Week	Problem solving appr	Problem solving approaches					
	7. Week	Traditional methods t	hat increase c	reativity				
Weekly Schedule	8. Week	The history and descr	iption of TRIZ	Z (TIPS)				
	9. Week	TRIZ philosophy and	methods					
	10. Week	40 principles and thei	r use in design	1				
	11. Week	The contradiction ma	trix and its use	e in design				
	12. Week	The other TRIZ tools	(material field	l analysis)				
	13. Week	Design applications o	f TRIZ					
	14. Week	Examination of term	course project	s				
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: Preparation of I Final Exam and	tical course hours: 2 l hours: 0 ties: 0 ng, library work: 2 implementing materials ng: 0 esentation: 3 l Midterm and Midterm 1 d Preparation for Final	s: 0 Exam: 3 Exam: 3					
			Numbers	Total Weighting				
	Midterm Exan	ns	1	40				
	Assignment		1	20				
	Application							
Assessment Criteria	Practice							
	Quiz							
	Percent of In-t	term Studies		60				
	(%) Demoentance -f	Final Exam to Tatal		40				
	Score (%)	Final Exam to Total		40				
	Attendance							

W		Activity	Total Numbe r of	Duration (weekly hour)		Total Period Work Load		
	Weekly	Theoretical Course	14		2		28	
	Weekly	7 Tutorial Hours						
	Readin	g Tasks						
	Studies		12	2			24	
		al Design and						
	Report	Preparing						
Workload		ng a Presentation	4		3			12
		ations	5		1			5
	Midter	n Exam and	1		3			3
	Prepera Exam	ition for Midterm						
	Final E	xam and Preperation	1		3			3
	Other (should be						
	emphas	sized)					, ,	75
	Total V	Vorkload	-		-		74	75 5/25
	Course	Credit (ECTS)					/.	3
	Course	Program Outcom	nes					
	No	6		1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1 In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas; abit this knowledge effecti solving complex engin problems. problems.		f basic computer- specific lity to use ively in meering					
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developn	rmulate using tience, neering, nt the UN tent Goals.	x				
	3	3 Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and				x		
		Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl estimation and modell the analysis and soluti complex engineering recognising their limit	mation uding ling, for ion of problems, tations.		x			
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting g data, eting complex			X		

	6 Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.
	7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.
	8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and x
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr

	_	_	_	_	-	_	_	_	_	_	_
	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program
	Outcome1	Outcome2	Outcome3	Outcome4	Outcome5	Outcome6	Outcome7	çıktısı 8	Outcome9	Outcome10	Outcome11
TOTAL		1	3	1	3			1		1	2
Learnin			1		1						1
g											
outcome											
1											
Learnin			1		1						
g											
outcome											
2											
Learnin		1									
g											
outcome											
3											
Learnin			1	1	1						1
g											
outcome											
4											
Learnin								1		1	
g											
outcome											
5											

Course Description Form					
Course Code and Name	ETM309 SYSTEMATIC DESIGN 1				

Course Semester	5
Catalog Content	Introduction, Fundamentals of technical systems, Fundamentals of systematic approach, Product planning, Solution finding methods, Methods of selection and evaluation, Clarification of task (design specification), Conceptual design process, The application of conceptual design,
Textbook	 Börklü, H.R. (Türkçeye çeviri), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010.
Supplementary Textbooks	 Cross, Nigel. Engineering design methods: strategies for product design. John Wiley & Sons, 2021.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To have knowledge about engineering design, culture and history Learning the Systematic Design process and stages Learning methods to find solutions to design problems Understand the preparation and application of a requirement list Learning the conceptual design process and its implementation
Course Learning Outcomes	 Ability to analyze and design complex systems Ability to define the components of systems, determine their relationships, and evaluate the interactions between these components Ability to design systems in accordance with engineering standards and methods Ability to evaluate designs according to criteria such as efficiency, reliability, security and sustainability Ability to take sustainability and ethical principles into account in design processes
Instruction Methods	Face to face

	1. Week	Introduction: Importa	ance of the cou	ırse, Definition	and descri	ption of desi		
	2. Week	Design methodology	, Historical ba	ckground, Sim	ilar method	ls		
	3. Week	Fundamentals and pr	operties of tec	hnical systems				
	4. Week	Fundamentals of syst	ematic approa	ch, Good desig	gner charac			
	5. Week	Veek Product Planning, Solution Finding and Evaluation: Product Application rules						
	6. Week	Solution finding meth	uitive method					
	7. Week	(c) Discursive methods, Methods of combining solutions, S						
Waakhy Sahadula	8. Week	Product Developmen	t: General pro	blem solving,	Systematic	design proce		
weekiy Schedule	9. Week	Clarification of Task	Requirement	s list (design s	pecification), Applicatio		
	10. Week	Conceptual Design P principle, Variants	rocess: Proble	m formulation	, Abstractic	on, Function s		
	11. Week	Design catalogues, C methods	lassification so	chemes, Morpl	nological m	atrix and des		
	12. Week	Conceptual design ex	ample-I: Impu	ulse-loading te	st rig			
	13. Week	Conceptual design ex	ample-II: Wat	ter mixing tap				
	14. Week	Examination of desig						
	W1-14h							
Teaching and Learning Methods (<i>These are examples. Please fill which activities you use in the course</i>)	Weekly tutorial Reading Activi Internet browsi Designing and Report preparir Preparing a Pre Presentations: 1 Preparation of 1	l hours: 0 ties: 0 ng, library work: 2 implementing material ng: 0 esentation: 1 l Midterm and Midterm	s: 2 Exam: 3					
	Final Exam and	d Preparation for Final	Exam: 3					
			Numbers	Total Weighting				
	Midterm Exan	ns	1	40				
	Assignment							
	Projects		1	20				
Assessment Criteria	Practice		1	20				
	Quiz							
	Percent of In-t	term Studies		60				
	(%)							
	Percentage of Score (%)	Final Exam to Total		40				
	Attendance							

Wo Hc Re		Activity		Total Duration Numbe (weekly r of hour)		l	Total Perioc Work Load	
	Weekly	7 Theoretical Course	14	3			42	
	Weekly	/ Tutorial Hours						
	Readin	g Tasks						
	Studies		5	2				10
	Materia Implem	al Design and	5	2				10
	Report	Preparing						
Workload	Prepari	ng a Presentation	5		1			5
	Present	ations	2		1			2
		m Exam and attion for Midterm	1		3			3
	Final E for Fina	xam and Preperation al Exam	1		3			3
	emphas	should be sized)						
	Total W	Vorkload	-		-		,	75
	Total W	Vorkload / 25					75/25	
	Course	Program Outcom	nes					3
	No			1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 In-depth knowledge of mathematics, science, engineering concepts, aided computing and s engineering areas; abil this knowledge effecti solving complex engin problems.			X			
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using vience, neering, nt the UN nent Goals.		x			
	3	Ability to generate crossolutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet ds; design cesses, nder nd		X			
		Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems			x			
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting og data, eting complex			X		

	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	X		
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and			
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	X		
The Course's Lecturer(s) and Contact Informations	Prof. rbor	. Dr. Hüseyin Rıza BÖRKLÜ klu@gazi.edu.tr			

	Program Outcome 1	Program Outcome2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	2	2	2	2	3	1					1
Learning outcome 1	1	1	1	1	1						1
Learning outcome 2	1	1									
Learning outcome 3			1								
Learning outcome 4				1	1	1					
Learning outcome 5					1						

COURSE DESCRIPTION FORM								
Course Code and Name	ETM310 GRADUATION PROJECT PREPARATION							
Course Semester	6							

Catalog Content	The skill of determining the graduation project The skill of examining selected topics related to industrial design engineering The skill of analyzing theoretical, experimental, and/or computer-based final projects The skill of creating project plans for the determined project The skill of creating and reporting the necessary infrastructure for the graduation project course
Textbook	 Blessing, L.T.M and Chakrabarti, A., DRM, a Design Research Methodology, Springer, 2009. Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006.
Supplementary Textbooks	5.Kerzner, H., Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley, 2013.
Credit	2 ECTS
Prerequisites of the Course	No Prerequisites Attendance Requirements %70
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Making preparations for the graduation project Determining the project topic and method Creating the necessary scientific and technical infrastructure
Course Learning Outcomes	 Accessible information can be obtained and research can be conducted, utilizing databases and other sources of information. The subject of study is determined, and awareness about project management, risk management, and change management is provided. Fundamental professional engineering knowledge is acquired. The ability to write effective reports in compliance with writing standards is attained.
Instruction Methods	Oral presentation, project structuring and weekly checks, making necessary corrections and completing the project preparation file
	Week Subjects
	1 Project preparation techniques
	2 Literature search
	3 Review related posts
	5 Basic industrial product design strategies
	6 Problems encountered in industrial product design
Weekly Schedule	7 Work on sample projects
	8 Discription of project topics
	9 Discussion on project topics
	11 Completion of preliminary preparations for the determined project
	12 Creation of action plans.
	13 Creation of action plans.
	14 Making transaction cost calculations
	Weekly tutorial hours: 0
	Reading Activities: 1
Teaching and Learning Methods	Internet browsing, library work 1
	Designing and implementing materials: 1
	Preparing a Presentation: 2
	Presentations: 3
	Preparation of Midterm and Midterm Exam: 0
	Final Exam and Preparation for Final Exam: 2

			Number	rs Total Weighting (%)						
	Midter	m Exams								
	Assign	ment								
	Applic	ation								
Assassment Criteria	Project	S								
Assessment Criteria	Practic	e								
	Quiz									
	Percen Studies	t of In-term s (%)								
	Percen to Tota	tage of Final Exam Il Score (%)	1		1	00				
	Attend	ance								
		Activity		Total Number of Weeks	Dura n (wee hou	atio kly ır)		T Pe W L	'otal erio Vorl Joad	i di s I
	Weekly	Theoretical Course Ho	ours	14	2				28	
	Weekly	Tutorial Hours								
	Reading	Tasks		5	1				5	
	Studies			5	1		5			
Workload	Materia	Design and Implemen	tation	5	5 1			5		
	Report Preparing									
	Preparing a Presentation			1	1 2				2	
	Presenta	1	3				3			
	Midterm Exam and Preperation for			-	-				-	
	Final Ex	am and Preperation for	r Final	1	2				2	
	Other (should be emphasized)					1			
	Total W	orkload							50	
	Total W	orkload / 25						5	0/25	5
	Course	Credit (ECTS)							2	
	No	Program Outcor	nes			1	2	3	4	5
	1	1 In-depth knowledge of mathem basic engineering concepts, co computing and specific engine ability to use this knowledge of solving complex engineering p			nce, ed n			x		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco Development Goals	formulate an g problems thematics a unt the UN	and analyse as using knowledge and engineering, N Sustainable				x		
	3	3 Ability to generate creative so engineering problems to meet needs; design complex system devices or products under real and conditions.			blutions to complex t current and future ns, processes, listic constraints					
	4	Ability to select and resources and modern information technolo estimation and mode solution of complex of	use approprint n engineerin gy tools, in lling, for th engineering	riate techning and cluding e analysis a problems,	ques,		x			

	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	X		
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).		x	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x	
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x	
The Course's Lecturer(s) and Contact Informations		Head of department tasarim@gazi.edu.tr			

	Program Outcome 1	Program Outcome 2	Program Outcom e3	Program Outcom e4	Program Outcom e5	Program Outcom e6	Program Outcom e7	Progra m çıktısı 8	Program Outcom e9	Program Outcome 10	Program Outcome 11
TOTA L	3	3	2	2	2			3	3	3	3
Learnin g outcom e 1	2	2									
Learnin g outcom e 2	1	1	1	1	1			1	1	1	1
Learnin g outcom e 3	1	1	1	1	1			1	1	1	1
Learnin g outcom e 4								1	1	1	1

COURSE DESCRIPTION FORM									
Course Code and Name	ETM402 FINITE ELEMENT ANALYSIS								
Course Semester	7-8								
Catalog Content	To be able to solve engineering problems by numerical analysis methods Ability to analyse spring, rod elements of finite element approach Ability to perform plate and surface, 3D elasticity analysis and design optimisation using finite element analysis software								
Textbook	 Xiaolin Chen, Yijun Liu, Finite Element Modelling and Simulation with ANSYS Workbench, Taylor & Francis Group, ISBN, 13: 978-1- 4398-7385-4, 2015. Saeed Moaveni , Finite Element Analysis—Theory and Application with ANSYS, Prentice Hall, 2008. 								
Supplementary Textbooks	1. Hughes, Thomas JR. The finite element method: linear static and dynamic finite element analysis. Courier Corporation, 2012.								
Credit	5 ECTS								
Prerequisites of the Course	No Prerequisites Attendance Requirements %70								
Type of the Course	Compulsory								
Instruction Language	Turkish								
Course Objectives	To teach basic Finite Element Analysis (FEA) theory and commercial FEA software applications for modelling and simulation of engineering problems and fundamentals of computer aided engineering and to gain the ability to apply them.								
Course Learning Outcomes	 To understand the theory of finite element methods To be able to explain the basic steps of finite element methods To be able to model structural elements using finite element method To be able to analyse an engineering structure using finite element method. 								
Instruction Methods	Face to face								
	Week Subjects 1 Basic principles of finite elements 2 Obtaining basic finite element equations with spring and rod element analogy								

	3	One dimensional ela	asticity the	ory				
	4	Computer application	ons - Mode	lling of ba	r and truss s	ystems		
	5	Two dimensional el	asticity the	ory	o dimonsion	al har and		
Weekly Schedule	0	truss systems	nis - moue	ining of tw	o uniciisioi	iai Uai allu		
	7	Beam theory; Beam	and frame	modelling	5			
	8	Computer application	ons - Beam	and frame	modelling	1 .		
	9	Finite element algor	ithm and i	ts applicati	on to finite	element		
	10	Mesh concept and n	, nesh optim	isation				
	11	Plate and surface me	odel analys	ses				
	12	3-D theory of elastic	city - Mecł	nanics of ri	gid bodies p	oroblems		
	13	Nonlinear structural	analyses a	and dynam	ic analyses			
	Weekly	theoretical course h	ours: 2		ling			
	Weekly	tutorial hour: 1						
	Readin	g Activities: 2						
Teaching and Learning Miethods	Designi	t browsing, library w	ork: 5 7 materials	• 5				
	Report	preparing: 0	5 materials					
	Preparing a Presentation: 0							
	Present	ations: 0 tion of Midtoms and	Midtama T	Twomen 6				
	Final Exam and Preparation for Final Exam: 8							
		1	Number	rs T	otal Weigh	ting		
			.5 1	ling				
	Midterm Exams				50			
	Assignment 2				10			
	Project	ation s						
Assessment Criteria	Practic	e						
	Quiz							
					(0)			
	Percen Studie	t of In-term			60			
	200010							
	Percen	tage of Final Exam			40			
	to Tota Attend	al Score (%)						
	Attend							
				Total Number	Duratio	Total Period		
		Activity		of	n (weekly	Work		
				Weeks	hour)	Load		
	Weekly	/ Theoretical Course	Hours	14	2	28		
	Weekly	/ Tutorial Hours		14	1	14		
	Readin	g Tasks		5	2	10		
	Studies			5	5	25		
Workload	Materia	al Design and Impler	nentation	4	5	20		
	Report	Preparing						
	Prepari	ng a Presentation						
	Present	ations						
	Midter	n Exam and Prepera	tion for	2	6	12		
	Final E	xam and Preperation	for Final	2	8	16		
	Other (should be emphasized	ed)					
	Total V	Vorkload		-	-	125		
	Total V	Vorkload / 25				125/25		
		Credit (ECTS)				5		

	No	Program Outcomes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problems.			x		
	2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable			х		
	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.				x	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems,				х	
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.					
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.					
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.					
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).					
		Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.					
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.					
The Course's Lecturer(s) and Contact Informations	Asog	ssist. Prof. Dr. Oğulcan EREN ulcaneren@gazi.edu.tr					

	Program Outcome 1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome6	Program Outcome 7	Program çıktısı 8	Program Outcome 9	Program Outcome10	Program Outcome11
TOTAL	3	3	4	4							

Learning	1	1	1	1				
outcome								
1								
Learning	1	1	1	1				
outcome								
2								
Learning	1		1	1				
outcome								
3								
Learning		1	1	1				
outcome								
4								

COURSE	DESC	CRIPTION FORM						
Course Code and Name	ETM1	03 TECHNICAL DRAWING 1						
Course Semester	1							
Catalog Content	Under Profes Ability Ability	standing and using technical drawing concepts sional and ethical responsibility y to use modern engineering methods y to communicate orally and in writing to identify, formulate and solve problems						
Textbook	1. Baj 2. Ku - Ç	ğcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. rs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen eviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012.						
Supplementary Textbooks	1. Ça <u>y</u>	ylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.						
Credit	3 ECT	8						
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkis	h						
Course Objectives	To provide opportunities to develop the necessary commun to effectively share design concepts, ideas and constraints v and manufacturers. To provide opportunities to communicate design concepts a other colleagues and manufacturers using the language of to drawing. Understand the engineering profession and ethics To learn the field of design engineering activity							
Course Learning Outcomes	 Des inform Des design effecti Hav engine Pro The unders 	ign engineering drawings can be interpreted accurately and the nation given through the drawings can be understood. ign concepts, ideas and constraints can be communicated to ers and manufacturers by using the language of technical drawing vely. re knowledge about the duties and authorities of the design eer. vide traceability and feedback at every stage of the design process. place and importance of design engineering in society is tood.						
Instruction Methods	Face to	face						
Weekly Schedule	Hafta 1 2 3 4 5 6 7 8 9 10 11 12	Konular Introduction (basic terms, tools and materials, scales, paper types) Types of writing and lines Geometric drawings Geometric drawing applications Projection and its types Appearance sticker Appearance sticker applications Sectional views Sectional view applications Measurement and dimensioning Perspectives Surface treatment marks						
	12	Tolerance and exercises						
	13	Production pictures						

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 0 Internet browsing, library work: 5 Designing and implementing materials: 5 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 3 Final Exam and Preparation for Final Exam: 4										
			Nun	nbers	Total V ('	Veigl %)	ntin	g			
	Midter	m Fxams	1								
	Assign	ment	1			20			_		
	Applic	ation	1		-	10					
Assessment Criteria	Project	s									
	Practic	e									
	Quiz										
	Percent of In-term				(60					
	Studies	s (%)									
	Percen	tage of Final Fyam				40					
	to Tota		-	ŦŪ							
	Attend	ance									
							Tota				
		Activity		Total Number of	Dur	atio		1			
		Activity	Weeks	i (wee	(weekly			Work			
	Weekly	Theoretical Course Ho	11175	14	2	2			28		
	Weekly	Tutorial Hours	14	1			- 1	4			
	Pending	Tacks	11	-							
	Studios	1 45K5	1	5				5			
	Studies	D 111	1 2	5			1	<u> </u>			
	Material	Design and Implemen	itation	2					10		
Workload	Report F	reparing									
	Preparin	g a Presentation									
	Presenta	tions									
	Midterm	Exam and Preperation	1 for	2	3		6				
	Final Ex	am and Preperation for	r Final	3	4	•			12		
	Other (s	should be emphasized)									
	Total W	orkload		-	-				75		
	Total W	orkload / 25						75	25		
	Course (Credit (ECTS)							3		
	No	Program Outcor	nes			1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge basic engineering cc computing and spec ability to use this kn solving complex eng	ematics, scie computer-aid neering areas effectively problems.	ence, led s; in				X			
	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	Formulate g probler thematic ount the U	and analyse ns using kno s and engine JN Sustainal	e owledge eering, ole						
	and taking into account the UN Sustainable 3 Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and can different										

	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations. Ability to use research methods, including				X
		literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.				
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing			x	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	X			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target				
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				X
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations	Heac tasar	d of Department im@gazi.edu.tr				

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4			5			4	2		5	3
Learnin	1			1			1			1	1
g											
outcome											
1											
Learnin	1			1			1	1		1	1
g											
outcome											
2											
Learnin	1			1			1			1	
g											
outcome											
3											
Learnin	1			1			1	1		1	1
g											
outcome											
4											
Learnin				1						1	
g											
outcome											
5											

COURSE	DESCRIPTION FORM
Course Code and Name	ETM104 TECHNICAL DRAWING 2
Course Semester	2
Catalog Content	Understanding and using technical drawing concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to communicate orally and in writing Ability to identify, formulate and solve problems
Textbook	 Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012.
Supplementary Textbooks	1. Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.
Credit	3 ECTS
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To provide opportunities to develop the necessary communication skills to effectively share design concepts, ideas and constraints with colleagues and manufacturers. To provide opportunities to communicate design concepts and ideas to other colleagues and manufacturers using the language of technical drawing. Understand the engineering profession and ethics To learn the field of design engineering activity To learn solution approaches to engineering problems
Course Learning Outcomes	 Design engineering drawings can be interpreted accurately and the information given through the drawings can be understood. Design concepts, ideas and constraints can be communicated to designers and manufacturers by using the language of technical drawing effectively. Have knowledge about the duties and authorities of the design engineer. Provide traceability and feedback at every stage of the design process. The place and importance of design engineering in society is understood.
Instruction Methods	Face to face
Weekly Schedule	HattaKonular1Introduction (review of basic topics)2Shape and position tolerances3Construction painting applications4Assembly pictures5Standard parts and their representation in assembly6Assembly numbering and letterheads editing7Assembly drawing applications8Drawing part (construction) drawings from assembly drawings9Applications10Analysis and assembly drawings of simple designs11Applications12Mounting elements (screw fasteners, wedges, springs) and their representation
	13 Gear wheels (spur) and cams 14 Applications

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 0 Internet browsing, library work: 5 Designing and implementing materials: 5 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 3 Final Exam and Preparation for Final Exam: 4											
			Nun	nders	i otal v (velgi %)	itin	g				
	Midter	m Exams	1			40						
	Assign	ment	1			20						
	Applic	ation										
Assessment Criteria	Project	S										
	Ouiz	e							_			
	Percen	t of In-term				60						
	Studies (%)											
						10						
	Percent to Tota	tage of Final Exam	1			40						
	Attend	ance										
								ntal				
		Activity		Total Number of	f Dur	atio	Period			1		
		rectivity	Weeks		(weekly			Work Load				
	Weekly	Theoretical Course Ho	14	2	2			28				
	Weekly	Tutorial Hours	14	1			14					
	Reading	Tasks										
	Studies		1	5	;			5				
	Material	Design and Implemen	2	5	5			10				
Workload	Report F	Preparing										
	Preparin	g a Presentation										
	Presenta	tions										
	Midterm	Exam and Preperation	n for	2	3	3			6			
	Final Ex	am and Preperation for	r Final	3	4			1	12			
	Other (s	should be emphasized)										
	Total W	orkload		-				7	75			
	Total W	orkload / 25						75	25			
	Course	Credit (ECTS)							3			
	No	Program Outcor	nes			1	2	3	4	5		
	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex eng	of mathe oncepts, c ific engir owledge gineering	ematics, scie computer-aid neering area effectively problems.	ence, ded s; in				X			
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	formulate g problen thematic ount the U	and analyse ns using kno s and engine JN Sustainal	e owledge eering, ble							
0	3	Ability to generate of engineering problem needs; design compl devices or products and conditions.	and taking into account the UN Sustainable 3 Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints									

	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations. Ability to use research methods, including				X
		literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.				
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing			x	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	X			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target				
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				X
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations	Heac tasar	d of Department im@gazi.edu.tr				

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4			5			4	2		5	3
Learnin	1			1			1			1	1
g											
outcome											
1											
Learnin	1			1			1	1		1	1
g											
outcome											
2											
Learnin	1			1			1			1	
g											
outcome											
3											
Learnin	1			1			1	1		1	1
g											
outcome											
4											
Learnin				1						1	
g											
outcome											
5											

	Course Description Form
Course Code and Name	ETM105 BASIC DESIGN 1
Course Semester	1
Catalog Content	Teamwork and leadership skills Ability to communicate verbally and visually, taking into account the user audience Problem identification and solving skills Ability to produce creative solutions Ability to think in an inquisitive way
Textbook	 Zelanski, P., Fiscer, M.P., 1995. Design Principles and Problems, Fort Worth: Harcourt Brace. Pentak, D., Pentak, S., 2000, Design Basics, Fort Worth, Harcourt Brace.
Supplementary Textbooks	 Karim, M., & Chen, X., 2017. Digital design: basic concepts and principles. CRC Press.
Credit	4 ECTS
Prerequisites of the Course (Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To have knowledge about basic design principles and elements Learning creative solution development approaches To be able to use design principles and elements in the product development process Develop teamwork skills
Course Learning Outcomes	 The process of generating creative solutions under specified constraints is learned. Gain knowledge about research methods in problem identification and solving process. Understand the importance of working both individually and in interdisciplinary teams. The process of verbal and visual communication for the target audience is learned. The importance of awareness, curiosity, creativity and lifelong learning is understood.
Instruction Methods	Expression, practice.

	1. Week	Introducing the aim,	scope and me	thodology of	the course					
	2. Week	Introduction of desig color-texture, light-s	gn elements (P hadow, measu	oint, line, pla are-proportior	ne, form, n, range)					
Weekly Schedule Feaching and Learning Methods These are examples. Please fill which activities you use in the course)	3. Week	Introduction of desig color-texture, light-s	gn elements (P hadow, measu	oint, line, pla re-proportior	ne, form, n, range)					
	4. Week	Realization of two-d design elements	imensional co	mposition stu	idies using					
	5. Week	Introduction of design hierarchy, rhythm, b	gn principles (alance, unity)	contrast, emp	hasis,					
	6. Week	Realization of two a studies using design	nd three dimer principles	nsional abstra	ct design					
	7. Week	Introduction of design hierarchy, rhythm, b	gn principles (alance, unity)	contrast, emp	hasis,					
Weekly Schedule	8. Week	Realization of two and three dimensional abstract design studies using design principles								
	9. Week	Introduction of designing the second	gn principles (alance, unity)	contrast, emp	hasis,					
	10. Week	Realization of two a studies using design	nd three dimer principles	nsional abstra	ct design					
	11. Week	Product design using design principles and elements (using creative idea generation techniques such as brainstorming and mind mapping)								
	12. Week	Product design using design principles and elements (creation of inspiration boards and idea sketches)								
	13. Week	Product design using design principles and elements (Mock-up studies)								
	14. Week	 Product design using design principles and elements (Three-dimensional model, technical drawing and layout design preparations) 								
	Weekly theoretical course hours: 2 Weekly tutorial hours: 2									
Teaching and Learning Methods	Reading Activ	ities: 0								
	Designing and	implementing materia	ls: 3							
(These are examples. Please fill which activities you use in the course)	Report preparing Preparing a Pre-	ng: 0 esentation: 2								
	Presentations:	1 Midterm and Midterm	Evom: 2							
	Final Exam an	d Preparation for Final	Exam: 3							
			Number	Total						
			3	weighti ng (%)						
	Midterm Exa	ns			_					
	Assignment		1	15	-					
	Projects		3	45						
Assessment Criteria	Practice		-		1					
	Quiz									
	Percent of In- (%)	term Studies		60						
	Percentage of Total Score (%	Final Exam to %)		40						
	Attendance									

		Activi ty	Total Numb er of Week s	I o (y h	Dur on we 7	•ati ekl r)	i		Tot al Peri od Wor k Loa d				
	Week	ly Theoretical Course	14			2			28				
	Week	ly Tutorial Hours	14			2			28				
	Readin	ng Tasks											
Workload	Studie	S	10			2			20				
	Mater: and	ial Design	5			3			15				
	Implei Repor	mentation											
	Prepar	ring a Presentation	1			2			2				
	Preser	ntations	1			1	1						
	Midte	rm Exam and	1			3			3				
	Prepei Midter	ration for rm Exam											
	Final I Preper	Exam and ration for Final	1			3			3				
	Other be	(should											
	empha	asized)							100				
	Total	Workload	-	-		-			100/25				
	Total	Workload / 25							100/25				
	Cours	Program Outco	mes						Т				
	N 0				2	3	4	5					
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge mathematics, science engineering concept computer-aided com and specific enginee ability to use this kn effectively in solving engineering problem	of e, basic s, puting ring areas; owledge g complex as.										
	2	Ability to identify, f and analyse complex engineering problem knowledge of basics mathematics and eng and taking into acco UN Sustainable Dev Goals.	ormulate as using science, gineering, unt the relopment										
	3	Ability to generate c solutions to complex engineering problem current and future ne design complex syst processes, devices o under realistic const conditions. Ability to select and appropriate techniqu resources and moder	reative as to meet eeds; ems, r products raints and use les, m	X		X							
		engineering and info technology tools, in estimation and mode the analysis and solu	ormation cluding elling, for ution of										

		complex engineering problems, recognising their limitations.					
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.			X		
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.					
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.					
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face- to-face, distance or hybrid).		x			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x			
	1 0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.					
	1	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	X				
The Course's Lecturer(s) and	Ass	t. Prof. Dr. Neslihan Top					

The Course's Lecturer(s) and **Contact Informations**

neslihantop@gazi.edu.tr

	Program outcome1	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program
TOTAL	outcomer	outcome2	outcomes	outcome4	outcomes	outcomeo	outcome /	outcomeo	outcome	outcomero	outcomerr
IOTAL			3	1	3			2	2		1
Learning			1								
outcome			-								
1											
Learning					1						
outcome											

2								
Learning						1		
outcome								
3								
Learning		1	1	1		1	1	
outcome								
4								
Learning		1		1			1	1
outcome								
5								

	Course Description Form									
Course Code and Name	ETM106 BASIC DESIGN 2									
Course Semester	2									
Catalog Content	Teamwork and leadership skills Ability to communicate verbally and visually, taking into account the user audience Problem identification and solving skills Ability to produce creative solutions Ability to think in an inquisitive way									
Textbook	 Zelanski, P., Fiscer, M.P., 1995. Design Principles and Problems, Fort Worth: Harcourt Brace. Pentak, D., Pentak, S., 2000, Design Basics, Fort Worth, Harcourt Brace. 									
Supplementary Textbooks	1. Karim, M., & Chen, X., 2017. Digital design: basic concepts and principles. CRC Press.									
Credit	4 ECTS									
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements									
Type of the Course	Compulsory									
Instruction Language	Turkish									
Course Objectives	To have knowledge about basic design principles and elements Learning creative solution development approaches To be able to use design principles and elements in the product development process Develop teamwork skills									
Course Learning Outcomes	 The process of generating creative solutions under specified constraints is learned. Gain knowledge about research methods in problem identification and solving process. Understand the importance of working both individually and in interdisciplinary teams. The process of verbal and visual communication for the target audience is learned. The importance of awareness, curiosity, creativity and lifelong learning is understood. 									
Instruction Method	Face to face									

	1. Week	Intro	ducing the aim, scope and methodology of	of the course				
	2. Week	Intro proje	ducing the relationship between form and ect including single material - single funct	l function and giving a ion criteria				
	3. Week	Crea	ting inspiration boards and idea sketches					
	4. Week	Eval	uation of three-dimensional mock-up stud	lies				
	5. Week	Real	ization of project presentations					
	6. Week	Intro modu	ducing the basics of modular design and turn and turn and the second sec	techniques for developing				
	7. Week	Mark	ket research and concept selection for mo	dular product design				
Weekly Schedule	8. Week	Crea	ting inspiration boards and idea sketches					
	9. Week	Eval	uation of three-dimensional mock-up stud	lies				
	10. Week	Real	ization of project presentations					
	11. Week	Introducing corporate identity and brand design (the basics of cr a brand identity)						
	12. Week	Mark	ket research and concept selection for mo	dular product design				
	13. Week	Crea	ting inspiration boards and idea sketches					
	14. Week Evaluation of three-dimensional mock-up studies							
Teaching and Learning Methods	Weekly theoreth Weekly tutorial Reading Activit Internet browsin Designing and in Report preparing Preparing a Press Presentations: 1 Preparation of M Final Exam and	cal co hours ies: 0 ng, lib: mplen g: 0 sentati Aidter Prepa	 aurse hours: 2 : 2 arary work: 2 nenting materials: 3 aon: 2 m and Midterm Exam: 3 ration for Final Exam: 3 					
			Numbers	Total Weighting (%)				
	Midterm Exam	S						
	Assignment							
	Application							
	Projects		3	60				
Aggagement Cuitoria	Practice							
Assessment Criteria	Quiz							
Assessment Uriteria	Percent of In-term			60				
	Studies (%)							
	Percent of In-tec Studies (%) Percentage of Final Exam to)		40				

		Activi ty	Total Numb er of Week s	I 0 ((y h	Dur on we nou	ati ekl r)			Tot al Peri od Wor k Loa
	Week	ly Theoretical Course	14			2			28
	Week	ly Tutorial Hours	14			2			28
	Readi	ng Tasks							
Workload	Studie	S	10			2			20
	Mater and	ial Design	5			3			15
	Imple	mentation							
	Repor	t Preparing	1			2			2
	Prepa	ring a Presentation	1			2			2
	Midte	rm Exam and	1			3			3
	Preper	ration for	1			5			5
	Final	rm Exam Exam and	1			3			3
	Preper	ration for Final	_			-			-
	Other	(should							
	be								
	Total	Workload	_	-			100		
	Total	Workload / 25							100/25
	Cours	e Credit (ECTS)							4
	N	Program Outco	mes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge mathematics, science engineering concept computer-aided com and specific enginee ability to use this kn effectively in solving engineering problem	of e, basic s, puting ring areas; owledge g complex is.						
	2	Ability to identify, f and analyse complex engineering problem knowledge of basic mathematics and eng and taking into acco UN Sustainable Dev Goals.	formulate s using science, gineering, unt the relopment						
	3	Ability to generate c solutions to complex engineering problem current and future ne design complex syst processes, devices o under realistic const conditions.	reative ts to meet eeds; ems, r products raints and			x			
	4	Ability to select and appropriate techniqu resources and moder engineering and info technology tools, inc estimation and mode the analysis and solu	use es, m ormation cluding elling, for ttion of	X					

		complex engineering problems, recognising their limitations.				
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.			X	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face- to-face, distance or hybrid).		X		
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		X		
	1 0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.				
	1	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	x			
The Course's Lecturer(s) and Contact Informations	Ass nesl	t. Prof. Dr. Neslihan Top lihantop@gazi.edu.tr				

	Program outcome1	Program outcome2	Program outcome3	Program outcome4	Program outcome5	Program outcome6	Program outcome7	Program outcome8	Program outcome9	Program outcome10	Program outcome11
TOTAL			3	1	3			2	2		1
Learning outcome 1			1								
Learning					1						

outcome 2								
Learning outcome 3						1		
Learning outcome 4		1	1	1		1	1	
Learning outcome 5		1		1			1	1

	Course Description Form
Course Code and Name	ETM107 FREE HAND SKETCHING AND DRAWING TECHNIQUES
Course Semester	1
Catalog Content	Learning and applying basic drawing principles Ability to use different drawing techniques Ability to determine the proportions and ratios of objects accurately Ability to reflect light and shadow accurately Ability to quickly and effectively translate ideas into drawings
Textbook	 Necatiİnceoğlu, Murat Soygeniş, Ela Çil, TasarımdaEskizler, YıldızTeknikÜniverstesi Yay., İstanbul, 1997. Necatiİnceoğlu, Tan Gürer, Ela Çil, DüşünmeveAnlatımAracıOlarakEskizler, Helikon Yay., İstanbul, 1995.
Supplementary Textbooks	 Stanyer, P., The Complete Book of DRAWING TECHNIQUES (A Professional Quide for the Artist, Arcturus Pub., UK., 2003
Credit	2 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Understanding the creative process of design Learning basic principles and conceptual studies Developing the ability to translate the image in the designer's mind onto paper Enhancing visual thinking skills Strengthening spontaneous expression abilities
Course Learning Outcomes	 Understanding of the basic principles and concepts of the design process is developed, while also supporting creative thinking and problem-solving skills. Introduction to the fundamental concepts of art and design, with practical application; also provides an opportunity to acquire basic knowledge of art history and theory. Development of the ability to express imagination and transfer visual thoughts into drawings, thereby supporting visual communication skills. Strengthening of visual reading and interpretation abilities; gaining the ability to understand and evaluate different visual styles and aesthetics. Enhancement of spontaneous expression skills through rapid drawing and designing techniques, thus gaining the ability to effectively visualize desired messages.
Instruction Methods	Face to face

	1. Week	Presentation of course grading systems.	e content, sem	ester expectati	ons, and					
	2. Week	Overview of freehand	l drawing.							
	3. Week	Methods and techniq	ues of freehand	d drawing.						
	4. Week	Drawing materials an	d techniques.							
	5. Week	Visualization of ideas	5.							
	6. Week	Drawing techniques -	Perspective.							
Waakhy Sahadula	7. Week	7. Week Drawing techniques - Dimensions, proportions.								
weekly Schedule	8. Week	Drawing techniques -	Light, shadov	W.						
	9. Week	Drawing techniques -	Drawing techniques - Coloring.							
	10. Week	Drawing techniques -	Coloring.							
	11. Week	Product-specific dive representation.	rsity of expres	sion and mater	rial					
	12. Week	Product-specific dive	rsity of expres	sion.						
	13. Week	Quick idea sketches.								
	14. Week	Quick idea sketches.								
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theore Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: Preparation of Final Exam and	tical course hours: 1 1 hours: 1 ities: 5 ing, library work: 5 implementing material ng: 0 esentation: 0 0 Midterm and Midterm d Preparation for Final	s: 6 Exam: 3 Exam: 3							
			Numbers	Total Weighting (%)						
	Midterm Exar	ns	1	40						
	Assignment		1	20						
	Application Projects									
Assessment Criteria	Practice									
	Ouiz									
	Percent of In-	term Studies		60						
	Percentage of Score (%)	Final Exam to Total		40						
	Attendance									

		Activity	Total Numbe r of Weeks	Dur (wee hou	ation ekly r)	l	T Pe W Lo	otal riod ork oad
	Weekly Hours	Theoretical Course	14		2			28
	Weekly	Tutorial Hours						
	Reading	g Tasks	5		1			5
	Studies	5	1				5	
Workload	Materia Implem	l Design and entation	2	3				6
	Dronori	reparing						
	Present	ations						
	Midterr	n Exam and tion for Midterm	1		3			3
	Exam							
		xam and Preperation	1		3			3
	Other (should be emphasized)							
	Total W	Vorkload	-		-			50
	Total W	/orkload / 25				-)/25
		Course Credit (ECTS)					2	
	No Program Outcome		ies	1 2 3		4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas; abi this knowledge effecti solving complex engin problems.	f basic computer- specific lity to use ively in neering	;			X	
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using tience, neering, nt the UN tent Goals.	x				
	3	Ability to generate cre solutions to complex engineering problems current and future nee complex systems, pro- devices or products ur realistic constraints ar	eative to meet ds; design cesses, nder nd			x		
	4	Ability to select and u appropriate techniques resources and modern engineering and infor- technology tools, inclu- estimation and modell the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.	X				

	6	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems. Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	X			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.	X			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).	X			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x		
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and				
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		X		
The Course's Lecturer(s) and Contact Informations	Prof isahi	. Dr. İsmail Şahin in@gazi.edu.tr				

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	4	1	3	1	1	-	1	1	2		2
Learning outcome 1			1					1			1
Learning outcome 2	1	1					1				1
Learning outcome 3	1		1						1		
Learning outcome 4	1			1					1		
Learning	1	1	1								
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outcome 5											

	Course Description Form						
Course Code and Name	ETM201 MATERIAL SCIENCE						
Course Semester	3						
Catalog Content	Physical and chemical properties of materials Mechanical properties of materials and their measurement One-dimensional problems, two-component phase diagrams Solidification and diffusion principles in alloy systems Structure-property relationship in metal, ceramic, polymer and composite materials, types of corrosion, protection methods Application examples and industrial applications						
Textbook	 Savaşkan, T. (2001). Malzeme bilgisi ve muayenesi eğitim bilimine giriş. Trabzon: Derya Yayıncılık. Uzun, H., Fındık, F. ve Salman, S. (2003). Malzeme biliminin temelleri. İstanbul: Değişim Yayıncılık. 						
Supplementary Textbooks	 Callister, W.D. (2003). An introduction to materials science and engineering. USA: John Wiley & Sons. 						
Credit	4 ECTS						
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Defining the basic physical and chemical properties of materials and understanding the importance of these properties in material selection. Understanding the mechanical properties of materials and factors such as strength, flexibility and hardness and learning methods to measure them. Understanding the properties of metal, ceramic, polymer and composite materials and evaluating the structure-property relationships of these materials. Defining corrosion, learning corrosion types and prevention methods.						
Course Learning Outcomes	 Knows simple rules about basic materials science. Students can distinguish atomic relationships that affect material properties, and can clarify material density, conductivity and shaping properties. They have preliminary knowledge about the strength mechanisms of materials. They can use material knowledge to solve design problems by learning materials science topics and methods. Selection of materials suitable for the product and being able to measure their behavior. 						
Instruction Methods	Face to face						

	1. Week	Classification of ma	aterials						
	2. Week	Atomic bonds, latti	ce systems						
	3. Week	Crystal systems							
	4. Week	Aging							
	5. Week	Material testing me	thods						
	6. Week	Tensile, compressio	on, bending, 1	torsion, fatigu	ie, impact	and hardne			
	7. Week	Alloy, phase, comp	onent definit	ion					
Weekly Schedule	8. Week	Phase law, cooling	curves, Iron-	cementite ph	ase diagra	m			
	9. Week	Isothermal transform	mation and c	ontinuous coo	oling diag	rams			
	10. Week	Heat treatments of	steels, steel s	tandards, role	e of alloyir	ng elements			
	11. Week	Stainless steels, too	l steels, high	speed steels					
	12. Week	Non-metal material	s						
	13. Week	Types of corrosion	Types of corrosion						
	14. Week	Corrosion protectio	on methods						
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 3 Weekly tutorial hours: 0 Reading Activities: 1 Internet browsing, library work: 1 Designing and implementing materials: 0 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 2								
			Numbers	Total Weighting (%)					
	Midterm Exan	ns	1	60					
	Assignment								
Aggaggement Critonia	Projects								
Assessment Uriteria	Practice								
	Quiz	0, 1		(0)					
	Percent of In-t	erm Studies		60					
	Percentage of Score (%)	Final Exam to Total		40					
	Attendance								

		Activity	Total Numbe r of	Dur (wee hou	ation ekly r)		T Pe W Lo	otal criod ork oad
	Weekly	Theoretical Course	14		3		-	42
	Weekly	/ Tutorial Hours						
	Readin	g Tasks	5		1			5
	Studies		14		1			14
	Materia	al Design and						
	Report	Preparing						
Workload	Prepari	ng a Presentation						
	Present	ations						
	Midter	m Exam and	4		2			8
	Exam	ation for Midterm						
	Final E	xam and Preperation	3		2			6
	Other (should be						
	emphas	sized) Vortaland					,	75
	Total V	Vorkload / 25	-		-		74	73 5/25
	Course	Credit (ECTS)					/.	3
	No	Program Outcom	nes	1	2	2	4	5
		T., J., 41, 1-1,1, J	£	1	2	5	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	and the mathematics, science, engineering concepts, aided computing and engineering areas; abit this knowledge effect solving complex engine problems.	basic computer- specific lity to use ively in meering			X		
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using tience, neering, nt the UN tent Goals.			X		
	3	Ability to generate cro solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	eative to meet ds; design cesses, nder nd				x	
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl- estimation and model the analysis and soluti complex engineering recognising their limit	mation uding ling, for ion of problems, tations.		x			
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting gg data, eting complex				X	

	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.			X	
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.			X	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).		X		
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	x			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and		x		
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations	Depa tas	artment Management arim@gazi.edu.tr				

	Program Outcome 1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome6	Program Outcome 7	Program çıktısı 8	Program Outcome 9	Program Outcome10	Program Outcome11
TOTAL	3	3	5	2	4	3	3	2	1	2	2
Learning outcome 1			1	1	1	1	1				
Learning outcome 2		1	1	1		1					
Learning outcome 3	1	1	1		1						
Learning outcome 4	1	1	1		1		1	1		1	1
Learning outcome 5	1		1		1	1	1	1	1	1	1

Course Description Form								
Course Code and Name	ETM202 MANUFACTURING TECHNOLOGIES 1							
Course Semester	4							
Catalog Content	Understanding of Casting, Forging, and Welding topics Measurement and control skills Machining skills Understanding of Drilling, Turning, Boring, and related processes							
Textbook	 Degarmo, E.P, Black, J.T. and Kohser, R.A. (1997). <i>Materials and processes in manufacturing</i>. USA: Prentice-Hall, Inc, Int. Ed. Boothroyd, G., Knight, W. A. (1989). <i>Fundamentals of machining and machine cutting</i>. New York: Mark Dekker Inc. M.P. Groover, <i>Fundamentals of modern manufacturing</i>, 3rd ed., 2007, Wiley 							
Supplementary Textbooks	 Kalpakjian, S., Schmid, S. R. (2005). <i>Manufacturing engineering and technology</i>. Londra: Pearson, 5th Ed. DeGarmo, E. P., Black, J. T. (2007). <i>Materials and processes in manufacturing</i>. USA: John Wiley & Sons, 10th Ed. 							
Credit	3 ECTS							
Prerequisites of the Course (No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	Learning Casting processes (sand casting, mold sanding, pattern preparation, molding, metal casting) Learning Welding techniques (oxy-acetylene welding, arc welding, submerged arc welding) Recognizing Casting and Welding defects Learning Metal processing methods (forging, pressing, extrusion, rolling) Learning Machining methods (wire drawing, machining procedures)							
Course Learning Outcomes	 Learning basic operations and practical applications. Learning casting and forging methods. Learning welding techniques. Learning measurement-control tool and application methods. Learning machining methods. 							
Instruction Methods	Face to face Practical training							

	1. Week	Introduction, basic con	ncepts, hand t	tools and their	uses				
	2. Week	Machining and Machi	ning; Basic o	perations					
	3. Week	Casting: Model and co	ore making						
	4. Week	Casting: Casting meth	ods and appli	ications					
	5. Week	Tattoo: Tattoo method	ls and applica	ations					
	6. Week	Source and application	n methods						
	7. Week	Application 1							
Weekly Schedule	8. Week	Application 2							
	9. Week	Measurement - Contro	ol						
	10. Week	Applications							
	11. Week	Machining: General to	ools, Machine	e tools and thei	r uses				
	12. Week	Hole drilling, Drilling	tools and dri	lling with diffe	erent methods				
	13. Week	Machining: Turning, 7	Furning proce	esses and appli	cations				
	14. Week	Machining: Milling, Milling processes and applications							
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 0 Internet browsing, library work: 5 Designing and implementing materials: 5 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 4 Final Exam and Preparation for Final Exam: 4								
Assessment Criteria	Midterm Exar Assignment Application Projects Practice Quiz Percent of In- (%) Percentage of Score (%) Attendance	ns term Studies Final Exam to Total	1	Iotal Weighting (%) 60 60 60 40					

		Activity	Total Number of	Du n (w	ura veel	ntio kly	•		Total Period Work Load
	Weekly Hours	Theoretical Course	14	-		2			28
	Weekly	Tutorial Hours	14			1			14
	Reading	g Tasks							
	Studies		2			5	;		10
	Materia Implem	ll Design and entation	3			5			15
Westland	Report	Preparing							
workload	Prepari	ng a Presentation							
	Present	ations							
	Prepera Exam	tion for Midterm	1			4			4
	Final Ex for Fina	xam and Preperation	1			4			4
	Other (should be							
	Total W	/orkload	-			-			75
	Total W	/orkload / 25							75/25
	Course	Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		In-depth knowle mathematics, scien engineering concepts, aided computing ar engineering areas; ab this knowledge effe solving complex problems.	dge of ce, basic , computer- nd specific ility to use ectively in engineering		x				
	2	Ability to identify, for analyse complex problems using kno basic science, mathe engineering, and ta account the UN Development Goals.	rmulate and engineering owledge of matics and aking into Sustainable			x			
	3	Ability to generat solutions to complex of problems to meet of future needs; design systems, processes, products under constraints and conditi	e creative engineering current and n complex devices or realistic				x		
	4	Ability to select appropriate technique and modern engine information technol- including estimat modelling, for the a solution of complex problems, recognis limitations.	and use s, resources eering and ogy tools, ion and nalysis and engineering ing their			x			
	5	including literature designing and experiments, collec analysing and results, to investigat engineering problems	e search, conducting ting data, interpreting te complex				X		

	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.		x			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				x	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	x				
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).			x		
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x			
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x			
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr					

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	2	3	4	3	4	4	5	2	4	3	3
Learning outcome 1	1	1	1	1	1		1				
Learning outcome 2	1	1		1	1	1	1	1	1		1
Learning outcome 3			1	1	1	1	1		1	1	
Learning outcome 4			1		1	1	1		1	1	1
Learning outcome 5		1	1			1	1	1	1	1	1

Course Description Form									
Course Code and Name	ETM203 STATICS								
Course Semester	3								
Catalog Content	General principles. Vector operations. Force vectors. Particle equilibrium. Concept of moment. Equilibrium of rigid bodies. Structural analysis. Truss systems, support systems, and machines. Internal forces. Friction. Centroid and center of gravity. Moment of inertia. Virtual work method.								
Textbook	Hibbeler, "Engineering Statics"								
Supplementary Textbooks	 Hibbeler, Engineering Mechanics Ferdinand P. Beer, "Engineering Statics" 								
Credit	3 ECTS								
Prerequisites of the Course (Attendance Requirements)	No Prerequisites - %70 Attendance Requirements								
Type of the Course	Compulsory								
Instruction Language	Turkish								
Course Objectives	Learning the concepts of Force and Moment. Learning the concept of Static Equilibrium. Acquiring the ability to perform structural system analysis. Learning the concept of Internal Load. Understanding the concept of Friction. Learning the concepts of Geometric Center and Moment of Inertia.								
Course Learning Outcomes	 Acquiring the ability to draw Free Body Diagrams in mechanics and perform force-moment analyses. Acquiring the ability to perform internal load analyses. Learning the theory and application of engineering mechanics applied to solid bodies under the influence of planar forces. Learning the theory and application of engineering mechanics applied to bodies under the influence of three-dimensional force systems. Developing the ability to calculate geometric properties of cross- sections. 								
Instruction Methods	Face to face								
	Weeks Subjects								
	 Introduction to Statics and Solid Mechanics, Fundamental Concepts and Principles. Unit Systems. Vectors, Decomposition of Vectors, Vector Operations. 								
	3 Force Vectors in Plane and Space, Equilibrium of particle, Free Body Diagram (FBD).								
Weekly Schedule	4 Rigid Bodies, Internal and External Forces, Equivalent Forces, Types of Supports.								
	5 Resultant Force Systems, Concept of Moment, Moment of a Force about an Axis, Equilibrium of Rigid Bodies.								
	6 Structural Analysis, Support Systems, Truss Systems, Analysis and Calculation, Node and Section Method.								
	7 Application and Calculation of Support Systems to Machines.								
	8 Internal Forces, Distributed Forces, Bending Moment in Beams.								
	9 Shear Force and Bending Moment Diagrams.								
	10 Friction, Laws of Dry Friction, Coefficients of Friction, Rolling Friction.								
	11 Belt-Pulley Friction.								
	12 Center of Gravity and Centroid, Mass Center and Centroid, Composite bodies.								
	13 Moments of Inertia, Area and Mass Moments of Inertia, Parallel Axis Theorem.								
	14 Principle of Virtual Work.								

Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	 weekly incorrected course hours: 3 Weekly tutorial hours: 0 Reading Activities: 0 Internet browsing, library work: 0 Designing and implementing materials: 2 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 15 										
			Numb	ers T	otal Weig (%)	ghti	ng				
					()	,					
	Midter	m Exams	1		30			_			
	Assign	nent	3		15			_			
	Project	s						-			
Assessment Criteria	Practic	e						-			
	Quiz		3		15						
	Percent Studies	t of In-term			60						
	Percentage of Final Exam to Total Score (%)				40						
	Attenda	ance									
		Activity		Total Numbe r of Weeks	Duratio n (weekly hour)		io Tot Peri Wo ly Lo:				
	Weekly	Theoretical Course Ho	14	3	4		2				
	Weekly	Tutorial Hours									
	Reading	Tasks									
	Studies										
	Material	Design and Implemen	tation	4	2		8				
Workload	Report F	Preparing									
	Preparin	g a Presentation									
	Presenta	tions									
	Midterm	Exam and Preperation	n for	1	10		1	0			
	Final Ex	am and Preperation for	r Final	1	15		1	5			
	Other (s	hould be emphasized)									
	Total W	orkload					7	5			
	Total W	orkload / 25					75/	25			
	Course (Credit (ECTS)					3				
	No Program Outc			omes	1	2	3	4 5			
	In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problemsx										
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	ormulate as g problems thematics a unt the UN	nd analyse using knov nd enginee Sustainabl	wledge pring, le						
		Development Goals	•								

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.			x	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.				x
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex				
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	x			
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.	x			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	x			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	x			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	x			
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Ahmet TAŞKESEN taskesen@gazi.edu.tr				

	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome
	1	2	3	4	3	0	/	0	9	10	11
TOPLAM			_								
KATKI	3	4	3	4		1	1	1	1	1	2
DÜZEYİ											
Learning			1			1	1	1		1	
outcome 1	1		1			1	1	1	1	1	
Learning		1		1							
outcome 2		1		1							
Learning											
outcome 3		1	1	1							
Learning		1	1	1							1
outcome 4	1	1	1	1							1
Learning	1	1		1							
outcome 5		1									1

Course Description Form										
Course Code and Name	ETM204 STRENGTH OF MATERIALS									
Course Semester	4									
Catalog Content	Fundamental principles of statics and mechanics, concepts of stress and strain, mechanical properties of materials, stress-strain relationship (Hooke's Law), elastic constants, tension, compression, shear, torsion, bending stresses, bending and deflection in beams. Elastic curve equation, stresses due to temperature changes, buckling, stability of structures; compound loading, stress and strain transformation, principal stresses.									
Textbook	1. Russell C. Hibbeler, Mechanics of Materials, Pearson									
Supplementary Textbooks	 Gere, J., Mechanics of materials, Ferdinand P. Beer, Mechanics of Materials, McGraw-Hill 									
Credit	3 ECTS									
Prerequisites of the Course (Attendance Requirements)	No Prerequisites - %70 Attendance Requirements									
Type of the Course	Compulsory									
Instruction Language	Turkish									
Course Objectives	Stress analysis in elements subjected to axial or direct shear force Concept of strain Displacement in axially loaded bars Stress and angle of rotation in elements subjected to torsion Bending stress in beams Shear stress in beams subjected to transverse shear Stress analysis in elements subjected to compound loading Stress transformation equations and concepts of principal stress and maximum shear stress with Mohr's Circle									
Course Learning Outcomes	 Ability to calculate stresses for elastic objects Ability to calculate unit deformations in elastic objects Ability to calculate the stress state at a point under combined loading for mechanical design Understand the concepts of principal stress and be able to apply stress transformation 									
Instruction Methods	Face to face									
Weekly Schedule	Weeks Subjects 1 Introduction - Concept and types of stresses. 2 Normal stress, Shear stress. Bearing stresses in fasteners. 3 Allowable stress, safety factor. Concept of Strain. 4 Mechanical properties of materials. Relationship between Stress and Strain. Tensile test. Hooke's Law; Modulus of Elasticity and material constants. 5 Axial loading. Principle of superposition. Stresses and strains due to temperature changes. 6 Torsion. Stresses and strains in circular shafts. Angle of twist in elastic region. Design of power transmission shafts. 7 Torsion in non-circular elements. Torsion formula for thin-walled shafts. 8 Pure bending condition. Shear force and bending moment diagrams. 9 Bending and deflection in beams. Equation of elastic curve. 10 Shear stress in beams subjected to bending; Stress and Strain transformations. 11 Stress state due to compound loading. 12 Stress transformations in plane stress condition. Principal stresses. Maximum shear stress. 13 Mohr's Circle in plane stress condition.									
	 13 Mohr's Circle in plane stress condition. 14 Buckling. Stability of structures; Euler's Formula. 									

Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	hours: 3 Weekly tutorial hours: 0 Reading Activities: 1 Internet browsing, library work: 1 Designing and implementing materials: 2 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 2 Final Exam and Preparation for Final Exam: 9										
	Numbers Total Weighting										
					' 0)						
	Midter	m Exams	1		3	30					
	Assign	ment	3		1	5					
	Applic	ation									
	Project	S	-								
Assessment Criteria	Practic	e									
	Quiz		3		1	5					
	Percen [®] Studies	t of In-term s (%)			6	60					
	Percentage of Final Exam to Total Score (%)				4	0					
	Attend	ance									
		Activity	TotalDuraNumbenr of(weeWeekshou		·atio n ekly ur)		Total Perioo Work Load		l dl K l		
	Weekly	Theoretical Course Ho	14		3		42				
	Weekly	Tutorial Hours									
	Reading	Tasks		5 1			+	5			
	Studies			5			5		5		
	Material	Design and Implemen	tation	1	2		<u> </u>		8		
Workload		Proparing	lation	+	2			8			
	Durant										
	rieparin						+				
	Presenta		6	2	2		+		6		
	Midlern	Exam and Preperation	1 Ior	3	2		_		0		
	Final Ex	am and Preperation for	r Final	l	9		_		9		
	Other (s	should be emphasized)					+				
	Total W	orkload					_	7	/5		
	Total W	orkload / 25					_	75	/25)	
	Course (Credit (ECTS)							3		
	No Program Outc			omes		1	2	3	4	5	
	1	In-depth knowledge of engineering concepts and specific engineer knowledge effectively engineering problems	of mathema , computer- ing areas; a y in solving s.	tics, science aided comp bility to use complex	e, basic uting this				x		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, for engineering problems science, mathematics into account the UN S Goals.	rmulate and s using know and engine Sustainable	l analyse co wledge of ba ering, and ta Developme	mplex asic aking ent				x		

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.				x	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.			x		
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.					
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	x				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.	x				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).		x			
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x			
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x			
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.				x	
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Ahmet TAŞKESEN taskesen@gazi.edu.tr					

	Program çıktısı 1	Program çıktısı 2	Program çıktısı 3	Program çıktısı 4	Program çıktısı 5	Program çıktısı 6	Program çıktısı 7	Program çıktısı 8	Program çıktısı 9	Program çıktısı 10	Program çıktısı 11
TOPLAM	4	4	4	3		1	1	2	2	2	4
KATKI DÜZEYİ											
Öğrenim	1	1	1	1				1			1
çıktısı 1											
Öğrenim	1	1	1	1						1	1
çıktısı 2											
Öğrenim	1	1	1	1					1	1	1
çıktısı 3											
Öğrenim	1	1	1			1	1	1	1		1
cıktısı 4											

	Course Description Form
Course Code and Name	ETM205 ENGINEERING DESIGN TOOLS AND ELEMENTS
Course Semester	3
Catalog Content	Recognition of mechanical design elements (gears, cams, bearings, etc.) and understanding their functions Skill in constructing simple systems using mechanical design elements Ability to solve problems related to motion transmission Utilization of appropriate modeling methods
Textbook	 Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi, 2023.
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi, 2019.
Credit	4 ECTS
Prerequisites of the Course (No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning mechanical tools and components used in design according to Turkish and World standards Conducting studies on the modeling of mechanical science elements and their use in systems Learning common problems and practical approaches that industrial design engineers need to know during project design Learning approaches to solving engineering problems Acquiring knowledge about basic design and engineering topics Developing teamwork skills
Course Learning Outcomes	 Learning engineering design and components. Being able to evaluate the functions of components used in mechanical systems within the design. Developing the ability to generate ideas and solutions by using components used in mechanical systems within a given problem. Utilizing, modeling, and if necessary, conducting prototype work for components used in mechanical systems within the system, individually or as a group, and presenting them.
Instruction Methods	Face to face Practical training

	1. Week	Introduction, Basic of	oncepts							
	2. Week	Gear wheel mechani	sms							
	3. Week	Gear wheel mechani	sms							
	4. Week	Gear wheel mechani mechanisms	sms, belt pu	lley and chain						
	5. Week	Gear, pulley and cha applications in desig	in mechanis n systems	ms and their						
	6. Week	Gear, pulley and cha design systems	in mechanis	ms and their app	olications in					
Weekly Schedule	7. Week	Wedges, pins, pins, s	shims, circlij	ps						
	8. Week	Rivets and welds								
	9. Week	Springs and cams								
	10. Wee	k Practice								
	11. Wee	k Practice								
	12. Wee	k Bearings								
	13. Wee	k Bearings								
	14. Wee	k Construction example	les							
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 2 Reading Activities: 0 Internet browsing, library work: 2 Designing and implementing materials: 4 Report preparing: 2 Preparation of Midterm and Midterm Exam: 0 Final Exam and Preparation for Final Exam: 4									
			Number	s Total Weighting (%)						
	Midterm	Exams			_					
	Assignm	ent			_					
	Applicat	1011			_					
Assessment Criteria	Practice				_					
	Quiz		3	60	_					
	Percent o	of In-term Studies		60						
	(%) Percenta Score (%	ge of Final Exam to Total		40	-					
	Attendar	ice								
		Activity	Total Number of	Duratio n (weekly	Total Period Work					
		Weekly Theoretical Course	14	2	Load 28					
		Hours		_						
			1 1 4	^						
		Weekly Tutorial Hours	14	2	28					
		Weekly Tutorial Hours Reading Tasks	14	2	28					

	Materia	al Design and	5			4			20
	Report	Preparing	5			2			10
Workload	Prepari	ng a Presentation							
, or moun	Present	ations							
	Midter	n Exam and							
	Prepera Exam	tion for Midterm							
	Final E	xam and Preperation	2	4			16		
	Other (al Exam should be	_	-			_		
	emphas	sized)					100		
	Total Workload		-	-			100/25		
	Total v	Credit (ECTS)							100/23
		Program Outcom	les	-					-
	No	i regiuni e uteen		1	2	3	4	5	
	1	Adequate knowledge	e in		х				
		engineering subjects	pertaining						
		to the relevant discip	oline;						
Contribution Level Between Course Learning Outcomes and Program Outcomes		ability to use theoret	ical and in these						
outcomes and Program Outcomes		areas to model and se	olve						
		engineering problem	s.						
	2	Ability to identify, for	ormulate,		x				
		and solve complex entroplems: ability to s	ngineering select and						
		apply proper analysis	s and						
		modeling methods for	or this						
		purpose.							
	3	Ability to design a consistent process devi	omplex ice or			х			
		product under realist	ic						
		constraints and cond	itions, in						
		desired result; ability	to apply						
		modern design metho	ods for this						
		purpose.	1 . 1						
	4	Ability to develop, so use modern techniqu	elect and les and			х			
		tools necessary for a	nalysis and						
		solution of complex	problems						
		ability to use informa	ation						
		technologies effectiv	ely.						
	5	Ability to use research	ch iterature		х				
		search, designing and	d						
		conducting experime	ents,						
		interpreting data, analy	sing and						
		investigate complex							
	6	Knowledge of the ef	fects of			x			
		engineering practices	s on						

	7 Acting in accordance with the ethical principles of the engineering profession, 8 Ability to work effectively as a team member or leader both individually and within interdiscipling teams (free
	9 Ability to communicate x effectively on technical issues, both orally and in writing, x taking into account the various differences of the target audience (e.g. education,
	10 Knowledge of business life x practices such as project x management and economic feasibility analysis; awareness of entrepreneurship and innovation.
	11Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.x
The Course's Lecturer(s) and Contact Informations	1. Prof. Dr. Hüdayim BAŞAK, <u>hbasak@gazi.edu.tr</u>

	Program Outcome 1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome 6	Program Outcome7	Program Outcome8	Program Outcome 9	Program Outcome10	Program Outcome11
TOTAL	2	2	3	3	2	3		2	3		4
Learning outcome 1	1	1	1	1							1
Learning outcome 2	1	1	1	1	1	1		1			1
Learning outcome 3			1	1	1	1		1	1		1
Learning outcome 4						1			2		1

Course Description Form								
Course Code and Name	ETM206 DESIGN FOR X							
Course Semester	4							
Catalog Content	Design skills in accordance with traditional production methods Ability to design in accordance with design criteria such as ergonomics, reliability and cost Understanding of sustainability and product life cycle concepts Ability to comprehend product development processes in accordance with customer expectations and design targets Ability to redesign a sample industrial product by considering the basic design criteria							
Textbook	 Eastman, C. M. Design for X: concurrent engineering imperatives. Springer Science & Business Media, 2012. Blokdyk G. DFX design for X: A Project-Based Tutorial. Independent Publishing Platform, 2017. 							
Supplementary Textbooks	 Beitz, W., Pahl, G., & Grote, K. (1996). Engineering design: a systematic approach. Mrs Bulletin, 71. 							
Credit	4 ECTS							
Prerequisites of the Course (No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To learn design approaches suitable for customer expectations and target audience To understand manufacturing methods and design approaches suitable for manufacturing To be able to apply quality control, integration, packaging and reliable design criteria To learn different systematic approaches to achieve design goals To learn design approaches to increase product efficiency Knowledge of different industry expectations, design standards and practical approach							
Course Learning Outcomes	 To be able to define the product and identify possible design variables, To be able to determine appropriate design methods for mechanical structures, To be able to determine manufacturability analysis, measurability and assembly process, Functionality, determination of functional properties and determination of material characteristics of the product, To be able to define the ideal life cycle of the product, To be able to design basic mechanical elements, mechanisms and machines 							
Instruction Methods	Face to face Practical training							

	1. Week	Introduction, Basic co	oncepts								
	2. Week	Defining and analysir	ng the desig	n problem							
	3. Week	Design criteria for for	rming								
	4. Week	Design criteria for ma	achining								
	5. Week	Design criteria for cas	sting								
	6. Week	6. Week Design criteria in accordance with quality and standards									
	7. Week Design approaches for weight and cost										
Weekly Schedule	8. Week	Design criteria for sha	aft hub								
	9. Week	Design criteria suitab	le for bearin	g elements							
	10. Week	Design criteria for eas	se of mainte	nance							
	11. Week	Design criteria for rel	iability								
	12. Week	Design criteria for erg	gonomics								
	13. Week	Design approaches fo	r sustainabi	lity							
	14. Week	Design applications									
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theore Weekly tutoria Reading Activ Internet brows Designing and Report prepari Preparing a Pro- Presentations: Preparation of Final Exam an	tical course hours: 2 il hours: 2 ities: 0 ing, library work: 2 implementing materials ng: 2 esentation: 0 0 Midterm and Midterm 1 d Preparation for Final 1	s: 2 Exam: 4 Exam: 6								
			Numbers	5 Total Weighting (%)							
	Midterm Exa	ms									
	Assignment Application				-						
	Projects		1	30	-						
Assessment Criteria	Practice										
	Quiz		2	30							
	Percent of In-	term Studies		60							
	Percentage of	Final Exam to Total		40	-						
	Score (%)				_						
	Attendance										
		Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load						
	Wee	kly Theoretical Course	14	2	28						
	Wee	kly Tutorial Hours	14	2	28						

	Reading	g Tasks							
	Studies		5			2			10
	Materia	l Design and	5	2		2		10	
	Implem Peport	Preparing	2						10
Workload	Prepari	ng a Presentation	2			5			10
	Present	ations							
	Midterr	n Exam and	2			1			0
	Prepera	tion for Midterm	2			4			0
	Exam Final E	xam and Preperation	1			6			6
	for Fina	al Exam	1			0			0
	Other (emphas	should be sized)							
	Total W	Vorkload							100
	Total W	/orkload / 25							100/25
	Course	Credit (ECTS)							4
	No	Program Outcom	nes	1	2	3	4	5	
	1	In-depth knowledge of		-	- -		· ·		
		mathematics, science, b	pasic						
		engineering concepts, c aided computing and st	computer-						
Contribution Loval Batwaan Course Learning	engineering areas; ability to use								
Outcomes and Program Outcomes		solving complex engineering			x				
	problems.								
	2	Ability to identify, form	nulate and						
		problems using knowle	dge of basic						
		science, mathematics a engineering, and taking	nd v into			x			
		account the UN Sustair	nable						
		Development Goals.							
		A 1 '1' A	<i>.</i>		<u> </u>				
	3	solutions to complex er	ngineering						
		problems to meet curre	nt and						
		systems, processes, dev	mplex vices or						
		products under realistic	constraints				x		
		and conditions.							
		Ability to select and us	e		-	-	-	~	
	4	appropriate techniques,	resources					Î	
		and modern engineerin	g and / tools.						
		including estimation an	ıd						
		modelling, for the analy solution of complex en	ysis and gineering						
		problems, recognising	their						
		limitations.							

	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		x		
	6 7	Knowledge of the effects of engineering practices on society, health and safety economy. Acting in accordance with the	x			_
		ethical principles of the engineering profession, awareness				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid).				_
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).				-
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		×		-
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x		
The Course's Lecturer(s) and Contact Informations	As	sist. Prof. Dr. Oğulcan Eren ulcaneren@gazi.edu.tr				

	Program Outcome 1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome5	Program Outcome6	Program Outcome 7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	2	3	4	5	2	1				2	2
Learning outcome 1	1	1	1	1							
Learning outcome 2		1	1	1	1						
Learning outcome 3			1	1						1	1
Learning outcome 4			1	1						1	
Learning outcome 5	1	1				1					
Learning outcome 6				1	1						1

	Course Description Form						
Course Code and Name	ETM208 MECHANISMS						
Course Semester	4						
Catalog Content	Engineering Basic concepts, Degrees of Freedom Crank Slider Mechanism 4 bar Mechanism Movement analysis Connecting Rod Curve Position, Speed, Acceleration Analysis						
Textbook	 Eres Söylemez, Makina Teorisi-I Mekanizma Tekniği, 2017 İbrahim Deniz Akçalı, Mekanizma Tekniği Ahmet Özdemir, Ulvi Şeker, Mekanizmalar, 1995 J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition, McGraw Hill, 2014 Robert Norton Machine Design: An Integrated Approach, 6th Edition, Pearson, 2019 						
Supplementary Textbooks	 Sclater, Neil; Chironis, Nicholas, Mechanisms and Mechanical Devices Sourcebook, Fourth Edition. Neil Sclater, Mechanisms and Mechanical Devices Sourcebook, 5th Edition 5th Edition. 						
Credit	3 ECTS						
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Learning the field of design engineering activity Learning solution approaches to engineering problems Having knowledge of basic design and engineering issues In order for students to realize basic Machine Design, they learn the types of movements and which mechanism approaches can provide these movements. They have the ability to determine the movement types and mechanism types required for the design.						
Course Learning Outcomes	 The purpose of the courses to be taken in design engineering education and general concepts are learned. Knows what engineering skills a design engineer should have. Learns engineering calculation approaches. Recognizes mechanisms and knows where to use them. Place of use of mechanisms - gain calculation and design ability according to working conditions. 						
Instruction Methods	Face to face						

	1. Week	Basic concepts: Math	ematics and P	hysics approad	ches			
	2. Week	Introduction of the G	eneral Concep	t and basic				
	3. Week Degrees of Freedom							
	4. Week	4. Week Degrees of Freedom Applications						
	5. Week	5. Week Classification of mechanisms						
	6. Week	Crank – Slider (3 bar) mechanism r	notion analysi	s			
	7. Week	4 bar mechanism mot	tion analysis					
	8. Week	Crank – Slider (3 bar) mechanism (Connecting roc	l curve			
Weekly Schedule	9. Week	4 bar mechanism Cor	nnecting rod ci	urve				
	10. Week	Synthesis of mechani	sms (3 bar me	chanism)				
	11. Week	Synthesis of mechani	sms (4 bar me	chanism)				
	12. Week	Kinematic analysis, p analysis approaches (applications)	osition, veloc Mathematical	ity and acceler theorems and	ration			
	13. Week	Kinematic analysis, p analysis approaches (osition, veloci 3 rod mechani	ity and acceler ism)	ation			
	14. Week	Kinematic analysis, p analysis approaches (osition, veloci 4 rod mechani	ity and acceler	ation			
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutorial Reading Activit Internet browsin Designing and i Report preparin Preparing a Pre Presentations: (Preparation of I Final Exam and	ical course hours: 2 hours: 1 ties: 3 ng, library work: 1 implementing materials ng: 0 sentation: 0) Midterm and Midterm 1 Preparation for Final	s: 3 Exam: 8 Exam: 8					
			Numbers	Total Weighting (%)				
	Midterm Exan	ıs	1	30	1			
	Assignment							
	Application							
	Projects		1	30	-			
Assessment Criteria	Practice		_		-			
	Ouiz				1			
	Percent of In-t	erm Studies		60	-			
	(%)							
	Percentage of	Final Exam to Total		40	-			
	Score (%)							
	Attendance				1			

	Activity	Total Numbe r of Weeks	Duration (weekly hour)	Total Period Work Load
	Weekly Theoretical Course Hours	14	2	28
	Weekly Tutorial Hours	14	1	14
	Reading Tasks	2	3	6
	Studies	5	1	5
	Material Design and Implementation	2	3	6
Workload	Report Preparing			
	Preparing a Presentation			
	Presentations			

	Midterm Exam and Preperation for Midterm		1		8			8
	Final E for Fina	xam and Preperation al Exam	1		8			8
	Other (emphase	should be						
	Total W	Vorkload	-		-		,	75
	Total Workload / 25					75	5/25	
	Course	Credit (ECTS)						3
	No	Program Outcom	nes	1	2	2	1	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas; abi this knowledge effect	f basic computer- specific lity to use ively in	1	2	5	-	X
		problems.	licering					
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using cience, neering, nt the UN nent Goals.					x
	3	Ability to generate cre	eative			x		
		solutions to complex engineering problems current and future nee complex systems, pro- devices or products un realistic constraints ar	to meet ds; design cesses, nder nd					
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, inclu- estimation and modell the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.			X		
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting g data, eting complex		X			
	6	Knowledge of the effe engineering practices health and safety, econ sustainability and env within the framework Sustainable Developm awareness of the legal consequences of engin solutions.	ects of on society, nomy, ironment of the UN nent Goals; neering					

	 7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity. 8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid). a Ability to communicate
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. Image: Content of the second
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Murat Tolga ÖZKAN tozkan@gazi.edu.tr

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							
Learning outcome 4	1	1									
Learning outcome 5	1	1									

DESCRIPTION FORM				
ETM210 ELECTRONICS FOR PRODUCT AND SYSTEM DESIGN				
4				
Having a basic knowledge of electricity and electronics Ability to perform electrical circuit analysis Ability to use modern engineering methods Teamwork and leadership skills Ability to communicate verbally and in writing Ability to design, implement, and conduct experiments				
 Çelebi, H.H. (1999). <i>Elektrik bilgisi</i>. İstanbul: Yüce Yayınları. Özkan T. (1995). <i>Temel elektronik</i>. İstanbul: Kayhan Matbaası 				
1. Demirel, H. (2012). <i>Elektronik devre elemanları elektronik devreler</i> . İstanbul: Birsen Yayınevi				
2 ECTS				
No Prerequisites %70 Attendance Requirements				
Compulsory				
Turkish				
To be able to understand electrical circuits and instruments and use them in designs To be able to use electronic systems in industrial products To learn solution approaches to engineering problems				
 Gain knowledge about the use of electrical and electronic systems in industrial design. To have general knowledge about basic electrical and electronic systems. Understand the importance of electrical and electronic systems in design engineering. Basic electrical circuit analysis can be performed. Simple design examples of electronic elements can be realized. 				
Face to face				
Hafta Konular				
1 Introduction 2 The meaning and importance of design 3 Historical development of design 4 The importance of design for the national and industrial development 5 Important designs and innovations 6 The methodology of design and its rules 7 Fundamentals of design 8 Elementary design process 9 Analysing simple part designs 10 Component design 11 Applications of component designs 12 Analysing simple system designs 13 System design 14 Applications of system designs				

Teaching and Learning Methods	Weekly Weekly Reading Internet Designi Report J Preparin Presenta Final Es	theoretical course he tutorial hours: 0 g Activities: 0 browsing, library we ng and implementing preparing: 3 ng a Presentation: 2 ations: 2 tion of Midterm and kam and Preparation	ours: 2 ork: 1 g materials Midterm E for Final F	: 2 Exam: 2 Exam: 3					
			Numb	ers T	otal W (%	′eigh ⁄6)	tin	g	
	Midter	m Exams	1		4	·0			_
	Assign	ment	1		1	0			
	Applic	ation	1		1	0			
Assessment Criteria	Project	S							_
	Practic	e							_
	Quiz	4 - £ I 4				0			_
	Studies	t of in-term $s(\%)$			C	U			
	Studies	s (70)							
	Percen	tage of Final Exam			4	0			
	to Tota	ll Score (%)							
	Attend	ance							
		Activity		Total Number of	Dura n (wee	itio kly		Tot Peri Wor Loa	al od rk id
	Weekly	Theoretical Course Ho	ours	14	2	-		28	
	Weekly	Tutorial Hours							
	Reading	Tasks							
	Studies	, 		4	1			4	
	Material	Design and Implemen	itation	2	2			4	
Workload	Report I	Prenaring		1	3			3	
W OI KIDAU	Prenarin	g a Presentation		1	2			2	
	Presenta	tions		1	2			2	
	Midtern Midtern	n Exam and Preperation	1 for	2	2			4	
	Final Ex	am and Preperation for	r Final	1	3			3	
	Other (s	should be emphasized)							
	Total W	orkload		-	-			50)
	Total W	orkload / 25						50/2	25
	Course	Credit (ECTS)						2	
	No	Program Outcor	mes			1	2	3 4	5
	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex eng	of mathem oncepts, con ific engined owledge ef gineering p	natics, scier nputer-aid ering areas fectively in roblems.	nce, ed ; n			X	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	formulate as g problems thematics about the UN	nd analyse using know nd enginee Sustainab	wledge ering, le			x	
		Development Goals	•						

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions. Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and			x		x
	5	solution of complex engineering problems, recognising their limitations. Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.				x	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of	X				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing		X			
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target					
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	X				
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.					
The Course's Lecturer(s) and Contact Informations	Head tasar	d of Department im@gazi.edu.tr					

	Program Outcome1	Program	Program Outcome	Program Outcome4	Program Outcome	Program Outcome6	Program Outcome7	Program	Program Outcome9	Program Outcome1	Program
	Outcomer	Outcome2	3	Outcome4	5	Outcomeo	Outcome/	ÇIKUSI Ö	Outcomes	0	ÇIKLISI I I
TOTAL	4	4	5	3	4	1	2			1	
Learnin	1	1	1		1						
g											
outcome 1											
Learnin	1	1	1	1	1		1				
g											
outcome 2											
Learnin	1	1	1		1	1	1				
g											
outcome 3											
Learnin			1	1							
g											
outcome 4											
Learnin	1	1	1	1	1					1	
g											
outcome 5											

Course Description Form									
Course Code and Name	ETM212 COMPUTER AIDED DESIGN 1								
Course Semester	4								
Catalog Content	Design 2D and 3D parts Ability to use computer software Defining problems and creating solution suggestions Adapting to new technologies								
Textbook	 Lombard, N Taşkesen, A Modelleme, O Başak, H. A 	 Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007. 							
Supplementary Textbooks	1. Mendi, F Modellem	., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim – e – Analiz, Gazi Kitabevi, Ankara, 2012.							
Credit	2 ECTS								
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites- %70 Attendance Requirements								
Type of the Course	Compulsory								
Instruction Language	Turkish								
Course Objectives	 To teach students the basic principles of computer-aided design and 2D drawing techniques. To provide students with practical skills in solid and surface modeling by improving their 3D modeling skills. Realizing the design of complex products and systems To provide knowledge and application skills on sheet metal design and processing techniques in a computer-aided design environment. 								
Course Learning Outcomes	 Students models u Can desig Can creat standards 	can accurately and effectively create 2D drawings and 3D sing computer-aided design tools gn functional assemblies by combining different parts te technical documents in accordance with engineering							
Instruction Methods	Face to face								
	1. Week	Introduction and Fundamentals of Computer Aided Design							
	2. Week	2D Drawing Fundamentals and Tools							
	3. Week	Advanced 2D Drawing Techniques and applications							
	4. Week	3D Modeling Fundamentals							
	5. Week	3D Part Modeling Techniques							
	7 Wook	3D Part modeling and Editing							
	7. Week	Introduction to Assembly Design							
Weekly Schedule	9. Week	Assembly Design and Analysis							
	10. Week	Assembly and Motion Simulations							
	11. Week	Part-level Drawing and Documentation							
	12. Week	Technical Drawing and Documentation at assembly level							
	13. Week	Surface modeling Design and Modeling							
	14. Week	Surface modeling Application							

Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 4 Internet browsing, library work: 10 Designing and implementing materials: 0 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam:2 Final Exam and Preparation for Final Exam: 2								
				Numbers	8	We	Fota righ	ıl ting	
	Exams		1			40)	_	
	Assignm	ent		1			$\frac{10}{20}$		-
	Applicat	ion					-		
Assassment Critoria	Projects								
Assessment Criteria	Practice								
	Quiz								
	Percent	of In-ter	m Studies				60		
	(%)	0.51					40		_
	Percenta	ge of Fi	nal Exam to Total				40		
	Attendar	0) DCe			-				
	Theoman				D				Total
			Activity	Total Number of Weeks	Du (we hou	rat eek 1r)	lon y		Period Work Load
		Weekly Hours	Theoretical Course	14			2		28
		Weekly	Tutorial Hours	14			1		14
		Reading	g Tasks						
		Studies	-	2			2		4
		Materia Implem	l Design and entation						
		Report	Preparing						
Workload		Prepari	ng a Presentation						
		Present	ations						
		Midterr	n Exam and	1			2		2
		Prepera	tion for Midterm	-			_		-
		Exam	non and Propagation	1			`		2
		for Fina	al Exam	1			2		2
		Other (should be						
		emphas	ized)						50
		Total W	orkload	-			-		50/25
		Total W	/orkload / 25						30/23
		Course	Credit (ECTS)						2
		No	Program Outcom	nes	1	2	3 4	5	
Contribution Level Between Course Lea Outcomes and Program Outcomes	rning	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effecti solving complex engin problems.	f basic computer- specific lity to use ively in neering	x				

2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals.		X			
3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.			x		
4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		X			
5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.					-
6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.					
7	Acting in accordance with the ethical principles of the engineering profession,					
8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	x				
0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	X				

urse's Lec ations	turer(s) aı	nd Contac	t	11	Ability to l and continu and emergi think inqui technologi Head of tasarim(earn indepu uously, to a ing technol- sitively abo cal changes Departmen gazi.edu.t	endently dapt to nev ogies and to out s. nt tr			
Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program Outcome	Program ciktisi 8	Program Outcome	Program Outcome	Program Outcome
1	2	3	4	5	6	7		9	10	11
1	2	3	2					1	1	3
1	1	1	1							1
	1	1	1						1	1
		1						1		1
	urse's Lec ations	urse's Lecturer(s) an ations Program Outcome Program Outcome 1 2 1 1 1 1	Investignant Statement	urse's Lecturer(s) and Contact ations Program Outcome Program Outcome Program Outcome 1 2 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 urse's Lecturer(s) and Contact ations Program Outcome 2 Program Outcome 4 Program Outcome 5 1 2 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11 Ability to I and continuand emerging think inquitechnologi urse's Lecturer(s) and Contact tions Head of tasarim@ Program Outcome Program Outcome Program Outcome Program Outcome Program Outcome Program Outcome Outcome<	11 Ability to learn independent continuously, to a and emerging technol think inquisitively abore technological changes Head of Department tasarim@gazi.edu.t Program Outcome Outcome Outcome Outcome Outcome at a string of the str	Image: second	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x urse's Lecturer(s) and Contact ttions Program Program Program Program Program Program Program Program Program Outcome Program Outcome Program Outcome Program Outcome Program Outcome Outcome Outcome Program Program Outcome Program Outcome Outcome Program Outcome Program Program Outcome Outcome Program Outcome Outcome Program Program Outcome Program Outcome Outcome I	11 Ability to learn independently and continuously, to adapt to new and continuously, to adapt to new think inquisitively about technological changes. x x Image: Image
COURSE DESCRIPTION FORM										
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Course Code and Name	ETM301 THERMODYNAMICS									
Course Semester	5									
Catalog Content	Developing the ability to understand and comprehend basic thermodynamic concepts Professional and ethical responsibility Ability to use modern engineering methods Ability to identify, formulate and solve problems									
Textbook	 Çengel, Y. ve Boles, M., Mühendislik Yaklaşımıyla Termodinamik, (Çe. T. Derbentli), McGraw-Hill, İst., 1996. Çengel, Yunus A. Fundamentals of thermal-fluid science, McGraw- Hill 									
Supplementary Textbooks	 Öztürk, A. and Kılıç, A., Thermodynamics with Solved Problems, Çağlayan Kitabevi, 1998. 									
Credit	3 ECTS									
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements									
Type of the Course	Compulsory									
Instruction Language	Turkish									
Course Objectives	Understanding the engineering profession and ethics To develop the ability to define complex engineering problems and analyze them with the principles of thermodynamics. To learn solution approaches to engineering problems To develop the ability to produce solutions in terms of energy efficiency and sustainability using thermodynamic principles.									
Course Learning Outcomes	 To gain the ability to solve thermodynamic problems by mathematical and analytical methods To gain the ability to explain and apply the principles and laws of thermodynamics To gain the ability to transform thermodynamic topics into practical applications and adapt them to industrial problems. Develop the ability to describe and analyze the behavior of thermodynamic systems. To develop the ability to associate knowledge in the field of thermodynamics with current research and to produce innovative solutions 									
Instruction Methods	Face to face									
	Hafta Konular 1 Basic concepts and definitions. Dimension and units. System properties. Equilibrium state. State changes and cycles. Pressure. Temperature. The zeroth law of thermodynamics. 2 Pure matter and its properties. Pure matter and phase change stages. Shape properties and tables.									
Weekly Schedule	3 Ideal gas and equation of state. Real gases. Compressibility factor and generalized graph. Other equations of state. Introduction to the first law of thermodynamics.									
	4 First law of thermodynamics (for closed systems). Heat and work. Specific heat. Internal energy, enthalpy, specific heat of ideal gases. Specific heats of solids and liquids.									
	5 First law of thermodynamics (for open systems). Conservation of mass. Conservation of energy. Flow work. Open systems with continuous flow									
	6 Discontinuity in open systems. Steady state, steady flow systems. Second law of thermodynamics. Heat machines. Cooling systems and heat pumps.									
	7 Reversible and irreversible processes. Carnot cycle and its principles. Thermodynamic temperature scale.									

	8	Clausius inequality. Third law of thermo	Entropy dynamic	y. The princi cs. Entropy of	ple of entropy change of pure	increase. matter.			
	9	Entropy change of p Adiabatic efficienci	perfect games of sor	ases. Revers ne machines	ible continuou . Exergy and s	s flow work. second law			
	10	Second law solution	ofclose	ed and open	systems. Powe	er cycles			
	11	with gas flow: Air s	tandard	assumptions	Provitor ovole v	with			
		regeneration. Ideal j Rankine cycle. Idea regenerative Rankin	et propu l Rankin le cycle.	lsion cycles e cycle with Cogeneratio	Steam power reheating, ide	cycles: al			
	12	Refrigeration cycles Carnot cycle. Vapor	: Coolin	g machines ssion refrige	and heat pump eration cycle. H	os. Reverse Ieat pump			
	13	Ideal gas mixtures.	Air-vapo	or mixture.					
	14	Exercises.							
Teaching and Learning Methods	Weekly Weekly Reading	theoretical course he tutorial hours: 0 Activities: 2	ours: 3						
	Internet	t browsing, library w	ork: 2						
	Design	ing and implementing	g materia	als: 3					
	Report preparing: 0 Prenaring a Presentation: 0								
	Present	ations: 0							
	Preparation of Midterm and Midterm Exam: 2								
	Final E	xam and Preparation	for Fina	l Exam: 2					
	Num			nbers	fotal Weightin (%)	ng			
	Midter	rm Exams	1		40				
	Assignment								
	Application								
Assessment Criteria	Projec	ts							
	Ouiz		1		20				
	Percen Studie	t of In-term s (%)		60					
	Percent to Tota	atage of Final Exam							
	Attend	lance							
		Activity		Total Number of Weeks	Duration (weekly hour)	Total Period Work Load			
	Weekly	Theoretical Course Ho	ours	14	3	42			
	Weekly	Tutorial Hours							
	Reading	g Tasks		5	2	10			
	Studies			6	2	12			
	Materia	l Design and Implemen	itation	1	3	3			
Workload	Report	Preparing							
	Preparin	ng a Presentation							
	Present	ations							
	Midterm Exam and Preperation for			2	2	4			
	Final Exam and Preperation for Final			2	2	4			
	Other (should be emphasized)							
	Total W	Vorkload				75			
	Total W	/orkload / 25				75/25			

	Course	Course Credit (ECTS)						3	
	No	Program Outcomes	,		1	2	3	4	5
	1	In-depth knowledge of math basic engineering concepts, of computing and specific enginability to use this knowledge solving complex engineering	ematics, scien computer-aide neering areas; effectively in g problems.	ce, ed				x	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, formulate complex engineering problem of basic science, mathematic and taking into account the U	e and analyse ms using knov s and enginee JN Sustainabl	vledge ring, e			X		
	3 Ability to generate creative solutions to co engineering problems to meet current and needs; design complex systems, processes, devices or products under realistic constra- and conditions.							X	
	4	Ability to select and use appre- resources and modern engined information technology tools, estimation and modelling, for solution of complex engineer recognising their limitations.	opriate technic ering and including the analysis a ing problems,	ques, und		x			
	5	Ability to use research metho literature search, designing ar experiments, collecting data, interpreting results, to investi- engineering problems.	ds, including ad conducting analysing and gate complex						X
	6	Knowledge of the effects of e on society, health and safety, sustainability and environmer framework of the UN Sustain Goals; awareness of the legal	ngineering pra economy, nt within the able Developi consequences	actices ment s of					
	7	Acting in accordance with the of the engineering profession, ethical responsibilities; aware discrimination, impartiality an diversity.	e ethical princi , awareness of ness of non- nd embracing	iples				x	
	8	Ability to work effectively as leader both individually and w interdisciplinary teams (face-thybrid).	a team memb vithin to-face, distan	er or					
	9	Ability to communicate effect issues, both orally and in writ account the various difference	tively on techning, taking int es of the targe	nical to t					
	10	Knowledge of business life project management and econ analysis; awareness of entrepr	ractices such a nomic feasibili reneurship and	ns ity 1	X				
	11	Ability to learn independently to adapt to new and emerging think inquisitively about techn	and continuo technologies nological char	ously, and to nges.					
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Veysel Özdemir vozdemir@gazi.edu.tr								

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4	3	4	2	5		4			1	
Learnin	1	1	1		1		1				

g outcome									
1									
Learnin	1	1	1	1	1	1			
g									
outcome									
2									
Learnin	1	1	1	1	1	1			
g									
outcome									
3									
Learnin	1		1		1	1			
g									
outcome									
4									
Learnin					1			1	
g									
outcome									
5									

COURSE DESCRIPTION FORM									
Course Code and Name	ETM302 FLUID MECHANICS								
Course Semester	6								
Catalog Content	Professional and ethical responsibility Ability to use modern engineering methods Teamwork and leadership skills. Ability to communicate verbally and in writing Ability to identify, formulate and solve problems Ability to design, implement and design experiments								
Textbook	 Akışkanlar Mekaniği (Temelleri Ve Uygulamalari), Y. A. Çengel, J.M. Cimbala, 1. Baskı, <u>Güven</u> Bilimsel, 2008 Munson, B.R., Young, D.F., Okiishi, T.H. and Huebsch, W.W., Fundemantals of Fluid Mechanics, Wiley Pub. 2009. White, F.M., Fluid Mechanics, McGraw-Hill Pub., Int. Ed., 2011. 								
Supplementary Textbooks	 Akışkanlar Mekaniği ve Hidrolik Problemleri, C. Ilgaz, M.E.Karahan, A.Bulu, Çağlayan Kitabevi, 1. Baskı, 1993 Akışkanlar Mekaniği ve Hidrolik, RV.Giles, Güven Kitabevi, 1980 								
Credit	3 ECTS								
Prerequisites of the Course (<i>Attendance Requirements</i>)	No Prerequisites %70 Attendance Requirements								
Type of the Course	Elective								
Instruction Language	Turkish								
Course Objectives	Understanding the engineering profession and ethics To gain the ability to comprehend and analyze static and dynamic properties of fluids. To learn solution approaches to engineering problems To have knowledge of basic design and engineering issues								
Course Learning Outcomes	 Mastering the basic topics of fluid mechanics Develop the ability to analyze complex problems related to fluid flows. Gain the ability to understand and apply kinematic properties of fluids Acting in accordance with the ethical principles of the engineering profession, gaining awareness about ethical responsibilities To develop the ability to follow research in the field of fluid mechanics and to produce innovative solutions. 								
Instruction Methods	Face to face								
	Hafta Konular								
Weekly Schedule	1 Introduction 2 Fluid statics 3 Basic fluid dynamics - Bernolli equation 4 Fluid kinematics 5 Controllable volume analysis 6 Differential analysis of fluid flow 7 Dimensional analysis, simulation and modeling 8 Viscous flow in pipes 9 Flow over immersed objects 10 Applications 11 Flow in open channel 12 Compressible flow								
	13 Applications								
	14 Turbo machines								

Teaching and Learning Methods	Weekly theoretical course hours: 3 Weekly tutorial hours: 0 Reading Activities: 5 Internet browsing, library work: 5 Designing and implementing materials: 5 Report preparing: 2 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 4 Final Exam and Preparation for Final Exam: 5										
			Nun	mbers Total Weightin (%)			ıg				
	Midter	m Fxams	1				.0				
	Assign	20					_				
	Applic										
Assessment Criteria	Project	S									
	Practice										
	Quiz				0						
	Studies	s (%)				Q	U				
	2000000										
	Percen	tage of Final Exam				4	0				
	to Tota	l Score (%)									
	Attend	ance									
	Activity			Total Number of Weeks		f Duration (weekly hour)		n	Total Period Work		al od 'k d
	Weekly Theoretical Course Hours			14		3			42		u
	Weekly										
	Reading		1		4	5		5			
	Studies	2		5			10				
	Material	1		5			5				
Workload	Report F	2		2			4				
W OI KIDAU	Preparin	g a Presentation									
	Presenta	tions									
	Midterm	Exam and Preperation	1 for	1		4			4		
	Final Ex	am and Preperation for	r Final	1		5			5		
	Other (s	should be emphasized)									
	Total W	orkload		-		-	-			75	
	Total W	orkload / 25							7	5/2	5
	Course (Credit (ECTS)								3	
	No	Program Outcon	nes				1	2	3	4	5
	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex eng	ematics, s computer- neering ar effective g problem	cienc aidec eas; ly in s.	е, 1				X		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco	formulate g probler thematic ount the U	e and anal ns using l s and eng JN Sustai	yse know ineer nable	ledge ing,				x	
	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions						X			

	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.	X				
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.			X		
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of	x				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.	x				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).					
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target					
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	X				
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.					
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Veysel Özdemir vozdemir@gazi.edu.tr						

	Program Outcome1	Program Outcome2	Program Outcome 3	Program Outcome4	Program Outcome 5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome1 0	Program çıktısı 11
TOTAL	4	4	5	1	4	1	1			1	
Learnin g outcome 1	1	1	1	1	1						
Learnin g outcome 2	1	1	1		1						
Learnin g outcome 3	1	1	1		1						
Learnin g outcome 4		1	1			1	1				
Learnin g outcome 5	1		1		1					1	

	Course Description Form
Course Code and Name	ETM303 MACHINE ELEMENT 1
Course Semester	5
Catalog Content	Engineering Basic concepts Principal Stresses Material Behaviors Loading types Connectors Riveted Joints Welded Joints Bolted Joints
Textbook	 M. Tolga ÖZKAN Makine Elemanları Ders notları, 2024 Mustafa Akkurt, Makina Elemanları Birsen Yayınevi, 2018. J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition, McGraw Hill, 2014. Robert Norton Machine Design: An Integrated Approach, 6th Edition, Pearson, 2019.
Supplementary Textbooks	 Fatih C. Babalık, Kadir Çavdar, Makine Elemanları ve Konstrüksiyon Örnekleri, Dora Yayınları, 2021. Atila Bozacı, Makina Elemanları, Literatür Yayıncılık, 2023.
Credit	3 ECTS
Prerequisites of the Course (Attendance Requirements 70%
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning the field of design engineering activity Learning solution approaches to engineering problems Having knowledge of basic design and engineering issues By explaining the calculation approaches of basic Machine Elements to the students, it is aimed to enable them to learn and synthesize which machine elements will be used in the design process and the engineering approaches required for the design of these machine elements.
Course Learning Outcomes	 The purpose of the courses to be taken in design engineering education and general concepts are learned. Knows what engineering skills a design engineer should have Learns engineering calculation approaches Knows the Machine Elements and knows the places where they will be used. Place of use of Machine Elements - gain calculation and design ability according to working conditions
Instruction Methods	Face to face

	1. Week	Basic concepts; Basic	Mathematics	and Physics				
		approaches		2				
	2. Week	Principal stresses						
	3. Week	Hooke's law; Materia	l approach and	d behavior				
	4. Week	Material strength	••					
	5. Week	Stress hypothesis, sta	tic, dynamic lo	oading types				
	6. Week	Riveted Joints						
	7. Week	Riveted Joints						
Weekly Schedule	8. Week	Welded Joints						
	9. Week	Welded Joints						
	10. Week	Welded Joints						
	11. Week	Welded Joints						
	12. Week	Bolted Joints						
	13. Week	Bolted Joints						
	14. Week	Bolted Joints						
	Weekly theoret	ical course hours: 3						
	Weekly tutorial	hours: 0						
	Reading Activit	ties: 3						
Teaching and Learning Methods	Internet browsing, library work:1							
	Designing and implementing materials: 1							
(These are examples. Please fill which	Report preparing: 0							
activities you use in the course)	Preparing a Presentation: 0							
•	Presentations: ()						
	Preparation of I	Midterm and Midterm	Exam: 5					
	Final Exam and	Preparation for Final	Exam: 5					
			Numbers	Total				
			1 (4110) 010	Weighting				
				(%)				
	Midterm Exan	18	1	40				
	Assignment							
	Application		1	20				
	Projects							
Assessment Criteria	Practice							
	Ouiz							
	Percent of In-t	erm Studies		60				
	(%)							
	Percentage of	Final Exam to Total		40				
	Score (%)							
	Attendance							

	Activity	Total Numbe r of Weeks	Duration (weekly hour)	Total Period Work Load
	Weekly Theoretical Course Hours	14	3	42
	Weekly Tutorial Hours			
	Reading Tasks	4	3	12
	Studies	5	1	5
	Material Design and Implementation	6	1	6
Workload	Report Preparing			
	Preparing a Presentation			
	Presentations			
	Midterm Exam and Preperation for Midterm Exam	1	5	5

	Final E	xam and Preperation	1		5			5
	for Fina	al Exam						
	emphas	sized)						
	Total W	Vorkload	-		-		,	75
	Total W	Vorkload / 25					75	5/25
	Course	Credit (ECTS)						3
	No	Program Outcom	nes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in meering					X
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using vience, neering, nt the UN nent Goals.					X
	3	Ability to generate crossolutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet ds; design cesses, nder nd			x		
	4	Ability to select and u appropriate technique resources and modern engineering and infor technology tools, incl estimation and model the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.			X		
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting g data, eting complex		x			
	6	Knowledge of the effe engineering practices health and safety, eco sustainability and env within the framework Sustainable Developm awareness of the legal consequences of engin solutions.	ects of on society, nomy, ironment of the UN nent Goals; neering					
	7	Acting in accordance ethical principles of th engineering profession awareness of ethical responsibilities; aware non-discrimination, ir and embracing diversi	with the ne n, eness of npartiality ity.					

	8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Murat Tolga ÖZKAN tozkan@gazi.edu.tr	

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							
Learning outcome 4	1	1									
Learning outcome 5	1	1									

	Course Description Form
Course Code and Name	ETM304 MACHINE ELEMENT 2
Course Semester	6
Catalog Content	Engineering Basic concepts, Principal Stresses, Material Behaviors, Loading types, Power and Motion transmission Shaft Design Belt Pulley Mechanisms Gear Design Spur wheel Helical Gear Wheel Bevel Gear Wheel Bevel Gear Wheel Bearing Design
Textbook	 M. Tolga ÖZKAN Makine Elemanları Ders notları, 2024 Mustafa Akkurt, Makina Elemanları Birsen Yayınevi, 2018. J. E. Shigley, Shigley's Mechanical Engineering Design 10th Edition, McGraw Hill, 2014.
Supplementary Textbooks	 Robert Norton, Design of Machinery with Student Resource DVDMcGraw-Hill Education, 2011. Fatih C. Babalık, Kadir Çavdar, Makine Elemanları ve Konstrüksiyon Örnekleri, Dora Yayınları, 2021. Atila Bozacı, Makina Elemanları, Literatür Yayıncılık, 2023.
Credit	4 ECTS
Prerequisites of the Course (Attendance Requirements 70%
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning the field of design engineering activity Learning solution approaches to engineering problems Having knowledge of basic design and engineering issues By explaining the calculation approaches of basic Machine Elements to the students, it is aimed to enable them to learn and synthesize which machine elements will be used in the design process and the engineering approaches required for the design of these machine elements.
Course Learning Outcomes	 Ability to learn the purpose and general concepts of the courses to be taken in design engineering education Having engineering skills Ability to learn engineering calculation approaches Being able to recognize and use Machine Elements Use of Machine Elements - gaining the ability to calculate and design according to working conditions
Instruction Methods	Face to face

	1. Week	General concepts					
	2. Week	Power and movemen	t				
	3. Week	Design of shafts I	-				
	4. Week	Design of shafts II					
	5. Week	Powertrains					
	6. Week	Belt pulley design					
Weekly Schedule	7. Week	Spur gear design I					
Weekly Schedule	8. Week	Spur gear design II					
	9. Week	Helical gear design					
	10. Week	Bevel gear design I					
	11. Week	Bevel gear design II					
	12. Week	Worm and gear desig	;n				
	13. Week	Bearing design I					
	14. Week	Bearing design II					
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutorial Reading Activit Internet browsin Designing and in Report preparing Preparing a Pre Presentations: (Preparation of 1 Final Exam and	14. Week Bearing design II Veekly theoretical course hours: 3 Veekly tutorial hours: 0 teading Activities: 1 heternet browsing, library work: 1 Designing and implementing materials: 2 teport preparing: 0 reparting a Presentation: 0 reparation of Midterm and Midterm Exam: 10 inal Exam and Preparation for Final Exam: 10					
			Numbers	Total Weighting (%)			
Veekly Schedule Feaching and Learning Methods These are examples. Please fill which activities you use in the course) Assessment Criteria	Midterm Exan	18	1	40			
	Assignment						
	Application		1	20			
A second criteria	Projects						
Assessment Criteria	Practice						
	Quiz						
	Percent of In-t	erm Studies		60			
	(%)						
	Percentage of	Final Exam to Total		40			
	Score (%)						
	Attendance						

	Activity	Total Numbe r of Weeks	Duration (weekly hour)	Total Period Work Load
	Weekly Theoretical Course Hours	14	3	42
	Weekly Tutorial Hours			
	Reading Tasks	2	1	2
	Studies	12	1	12
	Material Design and Implementation	12	2	24
Workload	Report Preparing			
	Preparing a Presentation			
	Presentations			
	Midterm Exam and Preperation for Midterm Exam	1	10	10
	Final Exam and Preperation for Final Exam	1	10	10
	Other (should be emphasized)			

	Total W	Total Workload		-			1	00
	Total W	Vorkload / 25					100)/25
	Course	Credit (ECTS)					4	4
	No	Program Outcom	nes	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in neering					x
	2	Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using cience, neering, nt the UN nent Goals.					x
	3	Ability to generate cre solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	eative to meet ds; design cesses, nder nd			X		
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl- estimation and model the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.			x		
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting g data, eting complex		X			
	6	Knowledge of the effe engineering practices health and safety, eco sustainability and env within the framework Sustainable Developm awareness of the legal consequences of engin solutions.	ects of on society, nomy, ironment of the UN nent Goals; neering					
	7	Acting in accordance ethical principles of th engineering profession awareness of ethical responsibilities; aware non-discrimination, in and embracing diversi	with the ne n, eness of npartiality ity.					
	8	Ability to work effect team member or leade individually and with interdisciplinary team face, distance or hybri	ively as a er both in s (face-to- id).	X				

	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Murat Tolga ÖZKAN tozkan@gazi.edu.tr	

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Program Outcome 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	5	5	3	3	2			1			
Learning outcome 1	1	1	1	1	1			1			
Learning outcome 2	1	1	1	1	1						
Learning outcome 3	1	1	1	1							
Learning outcome 4	1	1									
Learning outcome 5	1	1									

COURSE D	DESCRIPTION FORM					
Course Code and Name	ETM305 PRODUCT DESIGN AND DEVELOPMENT					
Course Semester	5					
Catalog Content	Ability to use modern engineering tools Teamwork and leadership skills Ability to design and implement experiments Ability to identify problems and make designs Sustainable designs Developing innovative products					
Textbook	Ability to use modern engineering tools Teamwork and leadership skills Ability to identify problems and make designs Sustainable designs Developing innovative products 1. Keinonen, T. and Takala, R., Product Concept Design: A Review the Conceptual Design of Products in Industry, Springer, 2006. 2. Morris, R., Fundamentals of Product Design, AVA Pub., 2009. 1. Bordegoni, M. and Rizzi, C., Innovation in Product Design: Fre CAD to Virtual Prototyping, Springer, 2011. 5 ECTS No Prerequisites Attendance Requirements %70 Compulsory Turkish Generating innovative design ideas Solving and implementing a complex engineering project Using computer programs effectively Developing designs suitable for the target audience Improving teamwork ability Creating and implementing a design project 1. Students taking this course can prepare sketches, three-dimension model creation, structural analyses, technical drawings and prototyr required in the process of developing a new product. 2. Students taking this course can identify design problems and devel solution suggestions. 3. Students taking this course can create a detailed report includi research, design process, user needs analysis, analysis processes a final design recommendations. 4. Students taking this cour					
Supplementary Textbooks	1. Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.					
Credit	5 ECTS					
Prerequisites of the Course	No Prerequisites Attendance Requirements %70					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	Generating innovative design ideas Solving and implementing a complex engineering project Using computer programs effectively Developing designs suitable for the target audience Improving teamwork ability Creating and implementing a design project					
Course Learning Outcomes	 Students taking this course can prepare sketches, three-dimensional model creation, structural analyses, technical drawings and prototypes required in the process of developing a new product. Students taking this course can identify design problems and develop solution suggestions. Students taking this course can create a detailed report including research, design process, user needs analysis, analysis processes and final design recommendations. Students taking this course gain skills in working as a team by communicating effectively and collaborating. They gain the ability to effectively present the designed product or system 					
Instruction Methods	Face to face					
Weekly Schedule	WeekSubjects1Introduction to the Product Design Process2Product Design Specifications3Planning and Scheduling4Conceptual Design5Detail Design6Detail Design7Presentation of project8Design for Manufacturing (DFM)9Design for Assembly (DFA)10Design for Reliability11Human Factors in Design12Model and Prototyping13Design for Environment and Sustainability					

Teaching and Learning Methods	Weekly Weekly Reading Internet Designin Report p Preparin Presenta Preparat Final Ex	theoretical course h tutorial hours: 2 g Activities: 1 browsing, library w ng and implementing preparing: 2 ng a Presentation: 1 ations: 1 tion of Midterm and kam and Preparation	ours: 2 ork 2 g materials Midterm F for Final I	:: 2 Exam: Exam: 5						
			Number	rs T	otal W	eigh	ting			
				(%)						
	Midter	m Exams							-	
	Assign	ment							-	
	Application I				6	0				
Assessment Criteria	Project	s	1		0	0			-	
	Ouiz								-	
	Quil									
	Percent	t of In-term								
	Studies (%)				6	0				
	Dercent	tage of Final Exam								
	to Tota	l Score (%)	1	40						
	Attend	ance								
	Activity			Total Number of Weeks	Duratio n (weekly			Tota Perio Worl Loac	l d k l	
	Weekly Theoretical Course Hours			14	2		28			
	Weekly	Tutorial Hours		14	2		28			
	Reading	Tasks		5	1		5			
	Studies	1 05K5		5	2		10			
	Material	Design and Implemen	itation	12	$\frac{2}{2}$		24			
Workload	Doport D		liation	8	2					
	Droportin	a a Procentation		6	1					
	Dresente			3	1			3		
	Midtorm	Exam and Proparation	for	5	1			5		
			T 101	1	5			5		
	Final Ex	am and Preperation for	r Final	1	5			5		
	Total W	orkload						125		
	Total W	orkload / 25						5		
	Course	Tredit (ECTS)						5		
	Course (Program Outcou	nes							
	No		nes			1 2	2 3	4	5	
	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex en	of mathem oncepts, con ific engine owledge en gineering p	natics, scien mputer-aide ering areas; ffectively ir roblems.	nce, ed		X			
	2	Ability to identify, f	Formulate a	nd analyse	1 1		x			
Contribution Level Between Course Learning Outcomes and Program Outcomes		of basic science, ma and taking into acco	g problems thematics a ount the UN	using knov and enginee Sustainabl	vledge ering, le					

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	X	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		X
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		x
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.		
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.		
	8	Ability to work effectively as a team member or leader both individually and within	x	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and	x	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	X	
The Course's Lecturer(s) and Contact Informations		Dr. Nurullah Yüksel nurullahyuksel@gazi.edu.tr		

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	3	3	3	4	4			3	4	3	3
Learning outcome 1	1	1	1	1	1			1	1	1	1
Learning outcome 2	1	1	1	1	1				1		1
Learning outcome 3	1	1	1	1	1				1		
Learning outcome 4								1	1	1	1
Learning outcome 5				1	1			1		1	

COURSE D	ESCR	IPTION FORM				
Course Code and Name	ETM3	06 APPLIED PRODUCT ANS SYSTEM DESIGN				
Course Semester	6					
Catalog Content	Ability to use modern engineering tools Teamwork and leadership skills Ability to design and implement experiments Ability to identify problems and make designs Sustainable designs Developing innovative products					
Textbook	1. Kei the 2. Mo	inonen, T. and Takala, R., Product Concept Design: A Review of Conceptual Design of Products in Industry, Springer, 2006. rris, R., Fundamentals of Product Design, AVA Pub., 2009.				
Supplementary Textbooks	1. Bor CA	rdegoni, M. and Rizzi, C., Innovation in Product Design: From D to Virtual Prototyping, Springer, 2011.				
Credit	5 ECT	S				
Prerequisites of the Course	No Prerequisites Attendance Requirements %70					
Type of the Course	Compu	llsory				
Instruction Language	Turkish					
Course Objectives	Generating innovative design ideas Solving and implementing a complex engineering project Using computer programs effectively Developing designs suitable for the target audience Improving teamwork ability Creating and implementing a design project					
Course Learning Outcomes	 Students taking this course can prepare sketches, three-dimension model creation, structural analyses, technical drawings and prototyp required in the process of developing a new product. Students taking this course can identify design problems and devel- solution suggestions. Students taking this course can create a detailed report includi research, design process, user needs analysis, analysis processes a final design recommendations. Students taking this course gain skills in working as a team communicating effectively and collaborating. They gain the ability to effectively present the designed product 					
Instruction Methods	Face to	o face				
Weekly Schedule	Week 1 2 3 4 5 6 7 8 9 10 11 12 13	Subjects Project introduction and discussion Idea generation Needs analysis and evaluation Market and Literature research concept creation concept development Part modeling using CAD tools System modeling using CAD tools Simulation and analysis using CAE tools Creating technical documentation Prototyping Prototyping and testing Create a project report				
	14	Layout and presentation preparation techniques				

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 2 Reading Activities: 1 Internet browsing, library work 2 Designing and implementing materials: 2 Report preparing: 2 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: Final Exam and Preparation for Final Exam: 5							
			Number	s T	otal Weigh	ting		
					(70)			
	Midter	m Exams						
	Applic	ation						
Assessment Criteria	Project	ts		60				
	Practic	e						
	Quiz							
	Percen Studies	t of In-term s (%)		60				
	Percentage of Final Exam to Total Score (%)			40				
		Activity		Total Number of Weeks	Duratio n (weekly hour)	Total Period Work Load		
	Weekly	Theoretical Course Ho	ours	14	2	28		
	Weekly	Tutorial Hours	14	2	28			
	Reading	g Tasks	5	1	5			
	Studies			5	2	10		
Workload	Materia	l Design and Implemen	tation	12	2	24		
	Report I	Preparing		8	2	16		
	Preparin	ng a Presentation		6	1	6		
	Midtorn	Exam and Propagation	for	3	1	3		
	Einal Ex	and Dramanation for	n Einal	1	5	5		
	Other (should be emphasized)	i i illai		-	-		
	Total W	orkload		-	-	125		
	Total W	orkload / 25				5		
	Course	Credit (ECTS)				5		
	No	Program Outcor	nes		1	2 3 4 5		
	1 In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problems. x							
Contribution Level Between Course Learning Outcomes and Program Outcomes	solving complex engineering problems. 2 Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable X							

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	X	
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		x
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.		x
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.		
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.		
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	X	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	X	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	x	
The Course's Lecturer(s) and Contact		Dr. Nurullah Yüksel		

Informations

nurullahyuksel@gazi.edu.tr

	Program	Program	Program	Program	Program	Program	Program	Progra	Program	Program	Program
	Outcome	Outcome	Outcome	Outcome	Outcome	Outcome	Outcome	m çıktısı	Outcome	Outcome1	Outcome1
	1	2	3	4	5	6	7	8	9	0	1
TOTAL	3	3	3	4	4			3	4	3	3
Learnin	1	1	1	1	1			1	1	1	1
g											
outcome											
1											
Learnin	1	1	1	1	1				1		1
g											
outcome											
2											
Learnin	1	1	1	1	1				1		
g											
outcome											
3											
Learnin								1	1	1	1
g											
outcome											

4							
Learnin		1	1		1	1	
g							
outcome							
5							

	Course Description Form
Course Code and Name	ETM307 COMPUTER PROGRAMMING
Course Semester	5
Catalog Content	The understanding of the concept of matrices, the history of programming languages, their applications, and the working environment. Understanding of data types and variables. Understanding basic operations, basic commands, and functions. Ability to create iterative processes and loops. Ability to use decision (conditional) statements. Programming skills with MATLAB.
Textbook	 Attaway, Dorothy C. MATLAB: A Practical Introduction to Programming and Problem Solving. Butterworth-Heinemann, 2013. Dukkipati, Rao V. MATLAB: An Introduction with Applications. New Age International, 2008.
Supplementary Textbooks	 Mueller, John Paul, and Jim Sizemore. MATLAB for Dummies. John Wiley & Sons, 2021.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning computer programming concepts through applications in a programming language.
Course Learning Outcomes	 Learning computer programming topics and methods. Acquiring comprehensive and fundamental coding skills.
Instruction Methods	Face to face

	1 Week	Introduction						
	1. Week	Concept of Matrices						
	2. Week		·					
	3. Week	MAILAB Programm	ling Environm	lent				
	4. Week	Data Types - 1						
	5. Week	Data Types - 2						
	6. Week	Variables						
Weekly Schedule	7. Week	Basic and Arithmetic	Operations					
	8. Week	8. Week Basic Commands and Functions						
	9. Week	9. Week Iterative Processes and Loops - 1						
	10. Week	Iterative Processes an	id Loops - 2					
	11. Week	Decision (Conditiona	l) Statements					
	12. Week	Using Conditional St	atements with	Loops				
	13. Week	Programming with M	ATLAB					
	14. Week	Creating Function Fil	es					
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoretical course hours: 2 Weekly tutorial hours: 1 Reading Activities: 0 Internet browsing, library work: 2 Designing and implementing materials: 3 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 7 Final Exam and Preparation for Final Exam: 3							
			Numbers	Total Weighting (%)				
	Midterm Exan	ns	1	60				
	Assignment							
	Application							
Assessment Criteria	Projects							
	Practice							
	Quiz			(0)				
	(%)	term Studies		60				
	Percentage of Score (%)	Final Exam to Total		40				
	Attendance							

		Activity	Total Numbe r of Weeks	Dur (wee hou	ation ekly r)	l	T Pe W Lo	otal riod ork oad	
	Weekly Hours	Theoretical Course	14		2			28	
	Weekly	Tutorial Hours	14		1			14	
	Reading	g Tasks							
	Studies		7	2			14		
Workload	Materia Implem	l Design and entation	2		3			6	
	Report	Preparing							
	Prepart	ng a Presentation							
	Midterr	n Exam and	1		7			7	
	Prepera	tion for Midterm	1		,			'	
	Exam Final E	xam and Preperation	2		3			6	
	for Fina	al Exam						Ŭ	
	Other (emphas	should be ized)							
	Total W	/orkload	-		-		,	75	
	Total W	/orkload / 25					75/25		
	Course	Credit (ECTS)						3	
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge o mathematics, science, engineering concepts, aided computing and s engineering areas; abi this knowledge effecti solving complex engin problems.	f basic computer- specific lity to use ively in neering		x				
	2 Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals.								
	3	Ability to generate cre solutions to complex engineering problems current and future nee complex systems, pro devices or products un realistic constraints ar	to meet ds; design cesses, nder nd		X				
	4	Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, inclu- estimation and modell the analysis and soluti complex engineering recognising their limit	nse s, mation uding ling, for ion of problems, tations.		X				

team member or leader both individually and within interdisciplinary teams (face-to- face, distance or hybrid). 9 9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession). 10 10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and x 11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x	
7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.	
6 Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	
5 Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	

	Program Outcome1	Program Outcome2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome 6	Program Outcome7	Program çıktısı 8	Program Outcome9	Program Outcome10	Program Outcome11
TOTAL	2		2	2				1			2
Learning outcome 1	1		1	1							1
Learning outcome 2	1		1	1				1			1

	Course Description Form
Course Code and Name	ETM308 CREATIVITY AND INNOVATION
Course Semester	6
Catalog Content	Introduction, Creativity and innovation, Innovative and creative designs, Creative thinking techniques, Problem solving approaches, Introduction, history and philosophy of TRIZ, The history and description of TRIZ (TIPS), 40 principles and their use in design, The contradiction matrix and its use in design, The other TRIZ tools (material field analysis), Design applications of TRIZ, Examination of term course projects.
Textbook	 Goldenber, J. and Mazarsky, D., Creativity in Product Innovation, Cambridge Univ. Press, Int. Ed., 2002. Altshuller, G., 40 Principles: TRIZ Keys to Technical Innovation, TrizTools, V.1, Tech. Innovation Center, Worcester-MA, USA, 2005.
Supplementary Textbooks	 Niku, S.B., Creative Design of Products and Sysetms, John Wiley & Sons, Inc., Int. Ed., 2009. Le Masson, Pascal, Benoit Weil, and Armand Hatchuel. Strategic management of innovation and design. Cambridge Univ. Press, 2010.
Credit	3 ECTS
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Learning about creativity and innovation Learning creative thinking techniques Getting to know problem solving approaches Learning the TRIZ approach, contradiction matrix and 40 solution principles Getting to know other TRIZ tools Gain the ability to solve design problems using TRIZ
Course Learning Outcomes	 They learn different creative thinking techniques and the ability to apply these techniques to real world problems Ability to develop creative and innovative approaches to solve complex problems Ability to apply problem solving approaches The ability to look at problems from different perspectives, think flexibly and take risks Ability to learn leadership and communication strategies that support creativity in business environments and apply these strategies in their future careers
Instruction Methods	Face to face

	1. Week Introduction							
	2. Week	Creativity and innova	tion					
	3. Week	3. Week Innovation types						
	4. Week	Innovative and creativ	ve designs					
	5. Week	creative thinking techniques						
	6. Week	Week Problem solving approaches						
	7. Week	Traditional methods that increase creativity						
Weekly Schedule	8. Week	The history and descr	iption of TRIZ	Z (TIPS)				
	9. Week	TRIZ philosophy and	methods					
	10. Week	40 principles and thei	r use in design	1				
	11. Week	The contradiction ma	trix and its use	e in design				
	12. Week	The other TRIZ tools	(material field	l analysis)				
	13. Week	Design applications o	f TRIZ					
	14. Week	Examination of term	Examination of term course projects					
Teaching and Learning Methods (These are examples, Please fill which	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and	ical course hours: 2 l hours: 0 ties: 0 ng, library work: 2 implementing materials	5: 0					
activities you use in the course)	Report preparin Preparing a Pre Presentations: Preparation of J Final Exam and	ng: 0 esentation: 3 1 Midterm and Midterm Exam: 3 d Preparation for Final Exam: 3						
			Numbers	Total Weighting (%)				
	Midterm Exan	ns	1	40				
	Assignment		1	20				
	Application Projects							
Assessment Criteria	Practice							
	Quiz							
	Percent of In-t	erm Studies		60				
	Percentage of Score (%)	Final Exam to Total		40				
	Attendance							

		Activity	TotalDurationNumbe(weeklyr ofhour)			l	T Pe W Lo	otal criod ork oad	
	Weekly	Theoretical Course	14		2		28		
	Weekly	7 Tutorial Hours							
	Readin	g Tasks							
	Studies		12		2			24	
	Materia	al Design and							
	Report	Preparing							
Workload	Prepari	ng a Presentation	4		3		12		
	Present	ations	5		1			5	
	Midter	n Exam and	1		3			3	
	Prepera Exam	ition for Midterm							
	Final E	xam and Preperation	1		3			3	
	Other (should be							
	emphas	sized)					, ,	75	
	Total V	Vorkload	-		-		74	75 5/25	
	Course	Credit (ECTS)					/.	3	
		Program Outcom	nes						
	No	6		1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in meering						
	2 Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals			x					
	3	to meet ds; design cesses, nder nd			x				
		Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl estimation and model the analysis and soluti complex engineering recognising their limit	mation uding ling, for ion of problems, tations.		x				
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting g data, eting complex			X			

	6 Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.
	7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.
	8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and x
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr

	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program	Program
	Outcome1	Outcome?	Outcome3	Outcome4	Outcome5	Outcome6	Outcome7	ciktisi 8	Outcome9	Outcome10	Outcome11
TOTAL	Guicomer	1	3	1	3	Guttomeo	Guttome/	1	Guttomes	1	2
TOTAL		1	3	1	3			1		1	2
Learnin			1		1						1
g											
outcome											
1											
Learnin			1		1						
g											
outcome											
2											
Learnin		1									
g											
outcome											
3											
Learnin			1	1	1						1
g											
outcome											
4											
Learnin								1		1	
g											
outcome											
5											

Course Description Form								
Course Code and Name	ETM309 SYSTEMATIC DESIGN 1							
Course Semester	5							
Catalog Content	Introduction, Fundamentals of technical systems, Fundamentals of systematic approach, Product planning, Solution finding methods, Methods of selection and evaluation, Clarification of task (design specification), Conceptual design process, The application of conceptual design,							
Textbook	 Börklü, H.R. (Türkçeye çeviri), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010. 							
Supplementary Textbooks	 Cross, Nigel. Engineering design methods: strategies for product design. John Wiley & Sons, 2021. 							
Credit	3 ECTS							
Prerequisites of the Course (No Prerequisites %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To have knowledge about engineering design, culture and history Learning the Systematic Design process and stages Learning methods to find solutions to design problems Understand the preparation and application of a requirement list Learning the conceptual design process and its implementation							
Course Learning Outcomes	 Ability to analyze and design complex systems Ability to define the components of systems, determine their relationships, and evaluate the interactions between these components Ability to design systems in accordance with engineering standards and methods Ability to evaluate designs according to criteria such as efficiency, reliability, security and sustainability Ability to take sustainability and ethical principles into account in design processes 							
Instruction Methods	Face to face							

	1. Week	Introduction: Importa	ance of the cou	ırse, Definition	n and descr	ption of desi			
	2. Week	Design methodology,	, Historical ba	ckground, Sin	ilar methoo	ls			
	3. Week	Fundamentals and pr	operties of tec	hnical systems	5				
	4. Week	Fundamentals of syst	ematic approa	ch, Good desi	gner charac				
	5. Week	Product Planning, So Application rules	lution Finding	and Evaluation	on: Product				
	6. Week	Solution finding meth	hods: (a) Conv	ventional meth	ods, (b) Int	uitive method			
	7. Week	(c) Discursive metho	ds, Methods o	f combining so	olutions, Se	lection and e			
Wookhy Schodulo	8. Week	Veek Product Development: General problem solving, Systematic							
weekiy Schedule	9. Week	Clarification of Task	: Requirement	s list (design s	pecificatior	ı), Applicatio			
	10. Week	Conceptual Design P principle, Variants	rocess: Proble	m formulation	, Abstractio	on, Function s			
	11. Week	Design catalogues, C methods	lassification s	chemes, Morp	hological m	atrix and des			
	12. Week	Conceptual design ex	ample-I: Impu	ulse-loading te	st rig				
	13. Week	Conceptual design ex	ample-II: Wa	ter mixing tap					
	14. Week	Examination of desig							
Teaching and Learning Methods (These are examples. Please fill which activities you use in the course)	Weekly theoret Weekly tutoria Reading Activi Internet browsi Designing and Report preparin Preparing a Pre Presentations: Preparation of Final Exam and	tical course hours: 3 1 hours: 0 ities: 0 ing, library work: 2 implementing material ng: 0 esentation: 1 1 Midterm and Midterm d Preparation for Final	s: 2 Exam: 3 Exam: 3						
			Numbers	Total Weighting					
				(%)	_				
	Midterm Exan	ns	1	40	-				
	Application				-				
	Projects		1	20	-				
Assessment Criteria	Practice]				
	Quiz								
	Percent of In-	term Studies		60					
	(%) Percentage of Final Exam to Total 40								
	Score (%)								
	Attendance								

		Activity	Total Dur Numbe (we r of hou		Duration (weekly hour)			otal riod ork oad
	Weekly	7 Theoretical Course	14		3			42
	Weekly	/ Tutorial Hours						
	Readin	g Tasks						
	Studies		5	2			10	
	Materia Implem	al Design and	5	2				10
	Report	Preparing						
Workload	Prepari	ng a Presentation	5 1				5	
	Present	ations	2 1					2
	Midteri Prepera Exam	m Exam and ation for Midterm	1		3			3
-		xam and Preperation al Exam	1		3			3
	emphas	should be sized)						
	Total W	Vorkload	-		-		,	75
	Total W	Vorkload / 25					75	25
	Course	Program Outcom	les					3
	No		105	1	2	3	4	5
Contribution Level Between Course Learning Outcomes and Program Outcomes		In-depth knowledge o mathematics, science, engineering concepts, aided computing and engineering areas; abi this knowledge effect solving complex engin problems.	f basic computer- specific lity to use ively in neering		x			
		Ability to identify, for and analyse complex engineering problems knowledge of basic sc mathematics and engi and taking into accoun Sustainable Developm	rmulate using cience, neering, nt the UN nent Goals.		x			
		3 Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and			X			
		Ability to select and u appropriate technique resources and modern engineering and infor- technology tools, incl- estimation and modell the analysis and soluti complex engineering recognising their limit	se s, mation uding ling, for ion of problems, tations.		x			
	5	Ability to use research including literature se designing and conduc experiments, collectin analysing and interpre- results, to investigate engineering problems	n methods, arch, ting ag data, eting complex			X		

	6 Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.
	7 Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.
	8 Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).
	9 Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).
	10 Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and
	11 Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes. x
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr

	Program	Program Outcome?	Program Outcomo ³	Program Outcomo4	Program Outcome5	Program	Program Outcomo7	Program	Program Outcome0	Program	Program Outcome11
	1	Outcome2	Outcomes	Outcome4	Outcomes	6	Outcome?	çıktisi ö	Outcomes	Outcomero	Outcomerr
TOTAL	2	2	2	2	3	1					1
Learning	1	1	1	1	1						1
outcome											
1											
Learning	1	1									
outcome											
2											
Learning			1								
outcome											
3											
Learning				1	1	1					
outcome											
4											
Learning					1						
outcome											
5											

COURSE DESCRIPTION FORM								
Course Code and Name	ETM310 GRADUATION PROJECT PREPARATION							
Course Semester	6							
Catalog Content	The skill of determining the graduation project The skill of examining selected topics related to industrial design engineering The skill of analyzing theoretical, experimental, and/or computer-based final projects The skill of creating project plans for the determined project The skill of creating and reporting the necessary infrastructure for the graduation project course							
Textbook	 Blessing, L.T.M and Chakrabarti, A., DRM, a Design Research Methodology, Springer, 2009. Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006. 							
Supplementary Textbooks	1.Kerzner, H., Project Management: A Systems Approach to Planning, Scheduling, and Controlling, Wiley, 2013.							
Credit	2 ECTS							
Prerequisites of the Course	No Prerequisites Attendance Requirements %70							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	Making preparations for the graduation project Determining the project topic and method Creating the necessary scientific and technical infrastructure							
Course Learning Outcomes	 Accessible information can be obtained and research can be conducted, utilizing databases and other sources of information. The subject of study is determined, and awareness about project management, risk management, and change management is provided. Fundamental professional engineering knowledge is acquired. The ability to write effective reports in compliance with writing standards is attained. 							
Instruction Methods	Oral presentation, project structuring and weekly checks, making necessary corrections and completing the project preparation file							
Weekly Schedule	WeekSubjects1Project preparation techniques2Literature search3Review related posts4Learning/developing scientific writing rules5Basic industrial product design strategies6Problems encountered in industrial product design7Work on sample projects8Discription of project topics9Discussion on project topics10Determining the project subject and method11Completion of preliminary preparations for the determined project12Creation of action plans.13Creation of action plans.14Making transaction cost calculations							

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 0 Reading Activities: 1 Internet browsing, library work 1 Designing and implementing materials: 1 Report preparing: 0 Preparing a Presentation: 2 Presentations: 3 Preparation of Midterm and Midterm Exam: 0 Final Exam and Preparation for Final Exam: 2									
Assessment Criteria	Midtern Assign Applica Project Practic	m Exams ment ation s e	Number		otal W ('	Veigh %)	itin	g		
	Quiz Percent Studies Percent to Tota Attenda	t of In-term 5 (%) tage of Final Exam 1 Score (%) ance	1		1	00				
	Activity			Total Number of Weeks	Duratio n (weekly			Total Period Work Load		
	Weekly	Theoretical Course Ho	14	2		28				
	Weekly	Tutorial Hours				<u> </u>				
	Reading	Tasks	5 1			5				
	Studies Matarial	Design and Implemen	5 1			5		5		
Workload	Report P	itation	5							
	Preparing a Presentation 1 2				2					
	Presentations 1 3						3			
	Midterm	Exam and Preperation	n for	-	-				-	
	Final Ex	am and Preperation for	r Final	1	2				2	
	Total W	orkload						5	50	\neg
	Total W	orkload / 25						50	/25	
	Course (Credit (ECTS)						4	2	
	No	Program Outcon	nes			1	2	3	4	5
	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex en	of mathem oncepts, con ific engined owledge ef gineering p	natics, scier nputer-aide ering areas; fectively in roblems.	nce, ed i			x		
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Ability to identify, f complex engineerin of basic science, ma and taking into acco Development Goals	formulate as g problems thematics a punt the UN	nd analyse using know and enginee Sustainab	wledge ering, le			x		
	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	x							
--	----	---	---	---	--					
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems,	x							
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	x							
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development								
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing								
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).		x						
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x						
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.		x						
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.		x						
The Course's Lecturer(s) and Contact Informations		Head of department tasarim@gazi.edu.tr								

	Program Outcome 1	Program Outcome 2	Program Outcome 3	Program Outcome 4	Program Outcome 5	Program Outcome 6	Program Outcome 7	Progra m çıktısı 8	Program Outcome 9	Program Outcome1 0	Program Outcome1 1
TOTAL	3	3	2	2	2			3	3	3	3
Learnin	2	2									
g outcome 1											
Learnin g outcome 2	1	1	1	1	1			1	1	1	1
Learnin g outcome 3	1	1	1	1	1			1	1	1	1
Learnin g outcome 4								1	1	1	1

COURSE D	ESCRIPTION FORM
Course Code and Name	ETM402 FINITE ELEMENT ANALYSIS
Course Semester	7-8
Catalog Content	To be able to solve engineering problems by numerical analysis methods Ability to analyse spring, rod elements of finite element approach Ability to perform plate and surface, 3D elasticity analysis and design optimisation using finite element analysis software
Textbook	 Xiaolin Chen, Yijun Liu, Finite Element Modelling and Simulation with ANSYS Workbench, Taylor & Francis Group, ISBN, 13: 978-1- 4398-7385-4, 2015. Saeed Moaveni , Finite Element Analysis—Theory and Application with ANSYS, Prentice Hall, 2008.
Supplementary Textbooks	1. Hughes, Thomas JR. The finite element method: linear static and dynamic finite element analysis. Courier Corporation, 2012.
Credit	5 ECTS
Prerequisites of the Course	No Prerequisites Attendance Requirements %70
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To teach basic Finite Element Analysis (FEA) theory and commercial FEA software applications for modelling and simulation of engineering problems and fundamentals of computer aided engineering and to gain the ability to apply them.
Course Learning Outcomes	 To understand the theory of finite element methods To be able to explain the basic steps of finite element methods To be able to model structural elements using finite element method To be able to analyse an engineering structure using finite element method.
Instruction Methods	Face to face
	Week Subjects
Weekly Schedule	1 Basic principles of finite elements 2 Obtaining basic finite element equations with spring and rod element analogy 3 One dimensional elasticity theory 4 Computer applications - Modelling of bar and truss systems 5 Two dimensional elasticity theory 6 Computer applications - Modelling of two dimensional bar and truss systems 7 Beam theory; Beam and frame modelling 8 Computer applications - Beam and frame modelling 9 Finite element algorithm and its application to finite element package programme
	10 Mesh concept and mesh optimisation 11 Plate and surface model analyses 12 3-D theory of elasticity - Mechanics of rigid bodies problems 13 Nonlinear structural analyses and dynamic analyses 14 Design optimisation by finite element fitting

Teaching and Learning Methods	Weekly Weekly Reading Internet Designi Report p Preparin Presenta Preparan Final Ex	theoretical course h tutorial hour: 1 g Activities: 2 browsing, library w ng and implementing preparing: 0 ng a Presentation: 0 ations: 0 tion of Midterm and cam and Preparation	ours: 2 ork: 5 g materials Midterm E for Final E	: 5 Exam: 6 Exam: 8						
	Numbers Total Weighting									
					(%	o)				
	Midter	m Exams	1		5	0				
	Assign	ment	2		1	0			_	
	Applic	ation							_	
Assessment Criteria	Projects									
	Quiz	<u> </u>								
	Percen [®] Studies	t of In-term s (%)			6	0				
	Percent to Tota	tage of Final Exam l Score (%)			4	0				
		Activity		Total Number of Weeks	Total Duratio Number n of (weekly Weeks hour)			tio Tot Peri dy Wo c) Lo		
	Weekly	Theoretical Course	14	2		28				
	Weekly	Tutorial Hours		14	1		14		ŀ	
	Reading	g Tasks		5 2			10)	
	Studies			5	5		25		5	
Workload	Materia	l Design and Impler	nentation	4 5			20			
	Report	Preparing								
	Prepari	ng a Presentation								
	Present	ations								
	Midterr	n Exam and Prepera	tion for	2	6			12	2	
	Final E	xam and Preperation	for Final	2	8			16)	_
	Other (should be emphasized	ed)					10		
	Total W	/orkload		-	-			12	5	_
	Total W	/orkload / 25						125/	25	_
	Course	Credit (ECTS)								┥
	No	Program Outcon	nes			1 2	2	3 4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	In-depth knowledge basic engineering co computing and spec ability to use this kn solving complex eng	of mathem oncepts, cor ific enginee owledge ef gineering pr	atics, scien nputer-aide ering areas; fectively ir roblems.	nce, ed n		Х			
	2	Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable					X			

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.	x
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems,	X
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.	
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.	
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).	
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	
The Course's Lecturer(s) and Contact Informations	As	sist. Prof. Dr. Oğulcan EREN ulcaneren@gazi.edu.tr	

	Program Outcome 1	Program Outcome2	Program Outcome3	Program Outcome 4	Program Outcome5	Program Outcome6	Program Outcome 7	Program çıktısı 8	Program Outcome 9	Program Outcome10	Program Outcome11
TOTAL	3	3	4	4							
Learning outcome 1	1	1	1	1							
Learning outcome 2	1	1	1	1							
Learning outcome 3	1		1	1							
Learning outcome 4		1	1	1							

	Course Description Form
Course Code and Name	ETM404 DESIGN PROJECT MANAGEMENT
Course Semester	7-8
Catalog Content	Project planning skills Project risk management skills Ability to establish cost control Design budget control skills Ability to prepare project work-time schedule Project team and client management skills Project quality control skills
Textbook	 Ramroth, W.G., Project Management for Design Professionals, AEC Ed., Int. Ed., 2006. Santos, J. M. D., Project Management Absolute Beginner's Guide, QUE Publishing, 2012.
Supplementary Textbooks	 Kerzner, H., Project Management: A Systems Approach to Planning, Scheduling and Controlling, 2013.
Credit	4 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn the use of human and physical resources in accordance with the budget determined in the process of developing a project Project planning skills and knowledge of project risk management To have knowledge about project team and customer management
Course Learning Outcomes	 The process of project planning and risk management in the project development process is learnt. The process of collecting data, analysing results and using research methods for design budget control in the project development process is learned. To have knowledge about business life applications such as project management and economic feasibility analysis.
Instruction Methods	Face to face

	1. Week	Introduction and basic concepts										
	2. Week	A brief history of project and design manager	nent									
	3. Week	Objectives and activities of project management	ent									
	4. Week	Design firm and project management										
	5. Week	How and what kind of features a good project	manager should have									
	6. Week	Project planning	g									
	7. Week	Project risk management										
weekly Schedule	8. Week	Creating cost control										
	9. Week	Design budget control										
	10. Week	To prepare project work-time schedule										
	11. Week	Project team and client management										
	12. Week	Project quality control										
	13. Week	Basic rules and checklist of project managem	ent									
	14. Week	Project management tools and software										
	Weekly theoretic	Weekly theoretical course hours: 2										
Teaching and Learning	Weekly tutorial	hours: 0										
Methods	Reading Activiti	es: 2										
	Internet browsin	g, library work:5										
	Designing and ir	nplementing materials: 0										
	Report preparing	y: 8										
	Preparing a Pres	entation: 0										
	Presentations: 0											
	Preparation of M	lidterm and Midterm Exam: 2										
	Final Exam and	Preparation for Final Exam: 4										
		Numbers	Total Weighting (%)									
	Midterm Exams	5 1	30									
	Assignment											
	Application	Application										
	Projects	Projects 1 30										
Assessment Criteria	Practice											
	Quiz											
	Studies (%)		0U									
	Percentage of		40									
	Final Exam to											
	Total Score (%))										
	Auchdance											

		Activi ty	Total Numb er of Week s	I o ((y h)ur on we iou	rati ekl r)			Tot al Peri od Wor k Loa
	Week	ly Theoretical Course	14	2				d 28	
	Week	ly Tutorial Hours							
	Readi	ng Tasks	8	2				16	
Workload	Studie	S	4			5			20
	Mater and	ial Design							
	Imple	mentation							
	Repor	t Preparing	3			8			24
	Prepa	ring a Presentation							
	Preser Midte	rm Exam and	2			2			<u>A</u>
	Preper	ration for	2			2			-
	Midte Final	rm Exam Exam and	2			4			8
	Preper	ration for Final	_			•			0
	Other	(should							
	be	(inclusion)							
	Total	Workload				100			
	Total	Workload / 25							100/25
	Cours	e Credit (ECTS)							4
	N Program Outcomes			1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	0	In-depth knowledge mathematics, science engineering concept computer-aided com and specific enginee ability to use this kn effectively in solving engineering problem	of e, basic s, nputing ring areas; owledge g complex ns.						
	2	Ability to identify, f and analyse complex engineering problem knowledge of basic mathematics and eng and taking into acco UN Sustainable Dev Goals.	ormulate s using science, gineering, unt the relopment						
	3	Ability to generate c solutions to complex engineering problem current and future ne design complex syst processes, devices o under realistic const conditions. Ability to select and	reative as to meet eeds; ems, r products raints and use	x					
		appropriate techniqu resources and moder engineering and info technology tools, ind estimation and mode the analysis and solu	tes, rn ormation cluding clling, for ttion of	A					

		complex engineering problems, recognising their limitations.				
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	X			
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions.				
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non-discrimination, impartiality and embracing diversity.				
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face- to-face, distance or hybrid).				
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).				
	1 0	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	x			
	1	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.				
The Course's Lecturer(s) and Contact Informations	Dep: tasai	artment administration rım@gazi.edu.tr				

	Program outcome1	Program outcome2	Program outcome3	Program outcome4	Program outcome5	Program outcome6	Program outcome7	Program outcome8	Program outcome9	Program outcome10	Program outcome11
TOTAL				1	1					1	
Learning outcome 1				1							
Learning					1						

outcome 2						
Learning					1	
outcome						
3						

COURSE DESCRIPTION FORM								
Course Code and Name	ETM410 GRADUATION PROJECT							
Course Semester	7-8							
Catalog Content	Skill in determining the topic of the graduation thesis Skill in literature review and information gathering related to the topic Skill in preparing calculations, analysis, designs, and sketch drawing (considering aesthetic, ergonomic, technological aspects, etc.) Skill in preparing computer-aided drawings, models, analyses, an animations							
Textbook	1. Ke the 2. Mc	inonen, T. and Takala, R., Product Concept Design: A Review of Conceptual Design of Products in Industry, Springer, 2006. rrris, R., Fundamentals of Product Design, AVA Pub., 2009.						
Supplementary Textbooks	Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.							
Credit	12 EC	rs						
Prerequisites of the Course	No Pre Attend	No Prerequisites Attendance Requirements %70						
Type of the Course	Compu	lsory						
Instruction Language	Turkis	1						
Course Objectives	 Acquiring the ability to design industrial systems, products, or products families that fulfill specific tasks Gaining the skill to design with realistic constraints Developing the ability to design by utilizing the knowledge acquired during Industrial Design Engineering education Acquiring the skill to analyze the designed products Gaining the capability to create prototypes of designed products systems. 							
Course Learning Outcomes	 Industrial Design Engineering problems are identified, defined, formulated, and solved. Modeling techniques are applied using appropriate engineering methods. Experimental or numerical designs are created, data is collected, results are analyzed, and interpreted. Proficiency in effective report writing and presentation is attained, adhering to writing standards. 							
Instruction Methods	Face to	o face						
Weekly Schedule	Week 1 2 3 4 5 6 7 8 9 10 11	SubjectsDetermination of the graduation thesis topicDetermination of literature review topics related to the subjectLiterature review on the subjectDetailed literature reviewDetailed literature review IDetailed literature review IIPreparation of calculation, analysis, design and sketchpictures(according to aesthetics/ergonomic/technological etc.)Preparation of computer aided pictures, models, analysis andanimationsPrototype manufacturing and testingDetermining and writing the contents of the thesis Critical IDetermining and writing the contents of the thesis Critical II						
		Determining and writing the contents of the thesis Critical III Determining and writing the contents of the thesis Critical IV						

	14 Submission of the final thesis									
	Weekly theoretical course hours: 3									
	Weekly practical hours: 3 Reading Activities: 7									
Teaching and Learning Methods	Internet browsing, library work: 5									
	Material	design, application:	2							
	Report p	preparation: 5								
	Presenta	tion preparation: 7								
	Presenta	tion: 3								
	Midterm	exam and preparati	on for mid	term exam	: 0					
	Final exa	am and preparation f	for final ex	am: 5						
			Number	rs Total Weigh (%)			ıting			
	Midterm Exams									
	Assignment									
	Application									
Assessment Criteria	Projects									
Assessment Criteria	Practic	e								
	Quiz									
	Percent of In-term Studies (%)									
	Percentage of Final Exam				100					
	to Tota	l Score (%)	-							
	Attend	ance					-			_
		Activity	Total Dura Number n of (wee Weeks hou		itio kly r)		Total Period Work Load			
	Weekly	Theoretical Course Ho	14	3	,	42				
	Weekly	Tutorial Hours	14	3		42				
	Reading	Tasks	10	7		7	70			
	Studies		12	5		60				
Workload	Material	Design and Implement	4	2		8				
, or mout	Report F	reparing	10	5		50				
	Preparin	g a Presentation	1	7		7				
	Presentations			2 3			6			
	Midterm Exam and Preperation for				1					
	Final Exam and Preparation for Final			3	5		1		15	
	Other (should be emphasized)									
	Total Workload							3	00	
					-	200	00	,		
	Total Workload / 25						-	300	0/23	
	Course (12		
	No Program Outcomes		nes			1	2	3	4	5
	1In-depth knowledge of mathematics, science, basic engineering concepts, computer-aided computing and specific engineering areas; ability to use this knowledge effectively in solving complex engineering problems.							х	¢	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2 Ability to identify, formulate and analyse complex engineering problems using knowledge of basic science, mathematics and engineering, and taking into account the UN Sustainable Development Goals. x									

	3	Ability to generate creative solutions to complex engineering problems to meet current and future needs; design complex systems, processes, devices or products under realistic constraints and conditions.		x
	4	Ability to select and use appropriate techniques, resources and modern engineering and information technology tools, including estimation and modelling, for the analysis and solution of complex engineering problems, recognising their limitations.		x
	5	Ability to use research methods, including literature search, designing and conducting experiments, collecting data, analysing and interpreting results, to investigate complex engineering problems.	x	
	6	Knowledge of the effects of engineering practices on society, health and safety, economy, sustainability and environment within the framework of the UN Sustainable Development Goals; awareness of the legal consequences of engineering solutions		
	7	Acting in accordance with the ethical principles of the engineering profession, awareness of ethical responsibilities; awareness of non- discrimination, impartiality and embracing diversity.		
	8	Ability to work effectively as a team member or leader both individually and within interdisciplinary teams (face-to-face, distance or hybrid).	x	
	9	Ability to communicate effectively on technical issues, both orally and in writing, taking into account the various differences of the target audience (e.g. education, language, profession).		x
	10	Knowledge of business life practices such as project management and economic feasibility analysis; awareness of entrepreneurship and innovation.	x	
	11	Ability to learn independently and continuously, to adapt to new and emerging technologies and to think inquisitively about technological changes.	x	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr		

	Program Outcome1	Program Outcome 2	Program Outcome3	Program Outcome4	Program Outcome5	Program Outcome6	Program Outcome7	Program çıktısı 8	Program Outcome 9	Program Outcome 10	Program Outcome 11
TOTAL	4	4	5	4	4			4	5	4	4
Learning outcome 1	2	2	2	3	2						1
Learning outcome 2	1	1	2	1	1			1	1	2	1
Learning outcome 3	1	1	1	1	1			1	1	2	1
Learning outcome 4								2	3		1