Course Description Form						
Course Code and Name	ETM 228 - Perspective					
Course Semester	4					
Catalog Content	Introduction (description and importance of perspectives), Axonometric projection and its types, Isometric drawing and related applications, Dimetric drawing and related applications, Trimetric drawing and related applications, Oblique projection and its types, Cavalier drawing and related applications, Cabinet drawing and related applications, Bird's eye view drawing and related applications, One-point perspective and related applications, Two-point perspective and related applications, Three-point perspective and related applications, Drawing shadow in perspective.					
Textbook	-Çetinkaya, S., Teknik Perspektif, Ankara, 1995. -Çaylak, A., Bilgi ve Uygulama Yaprakları-I, Ankara, 2005. -Börklü, H.R. web sitesi.					
Supplementary Textbooks	Ali Pancarcı / M.Emin Öcal -,,Yapı Teknik Resmi", -Harbi Hotan -Mimari Perspektif ve Gölge", YEM Yayın, İstanbul, 3.Baskı, 1999 -Esen Onat -,,Perspektif ve Perspektifde Gölge Çizimi", -Francis D.K.Ching -,,Mimarlık ve SanattaYaratıcı Bir Süreç Çizimi", Çev.: Çelen Birkan, YEM Yayın -Francis D.K. Ching with Steven P. Juroszek -,,Desing Drawing", John Wiley&Sons, Inc. New York, 1998 -Jose M. Parramon -,,Çizim ve Resim Sanatı", Remzi Kitabevi, İstanbul, 2.Baskı, 1995					
Credit	3 ECTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Elective					
Instruction Language	Turkish					
Course Objectives	The course also builds on capability of transferring the spatial depth, a result of illusion, and of using line, form and textures in a certain order in pictorial images formed by benefiting from perspective rules.					
Course Learning Outcomes	Students who attend this course learn topics and methods of perspective.     They can draw basic perspective drawings.					
Instruction Methods	Practice, Face to face.					

	1. Week						
	2. Week	Axonometric projection and its types					
	3. Week	Isometric drawing and related applications					
	4. Week	Dimetrtic drawing and rela	ted application	ns			
	5. Week	Trimetric drawing and rela	ted application	ns			
	6. Week	Oblique projection and its	types				
	7. Week	Cavalier drawing and relate					
Weekly Schedule	8. Week	Cabinet drawing and relate	11				
	9. Week	Bird's eye view drawing ar					
	10. Week	Conical perspective project	tion and its typ	pes			
	11. Week	One-point perspective and	related application	ations			
	12. Week	Two-point perspective and	related applic	eations			
	13. Week	Three-point perspective and	d related appl	ications			
	14. Week	Drawing shadow in perspective					
	Weekly th	neoretical course hours: 2					
Teaching and Learning Methods	Weekly to	utorial hours:0					
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0					
	Internet b materials:	rowsing, library work Design 0	ning and imple	ementing			
	Report pr	eparing: 0					
	Preparing	a Presentation: 45					
	Presentati	ons: 0					
	Preparation	on of Midterm and Midterm I	Exam: 0				
	Final Exam and Preparation for Final Exam: 0						
			Numbers	Total Weightin g (%)			
	Midtern		1	40			
	Assignm Applicat		1	20			
	Projects		1	ΔU			
Assessment Criteria	Practice						
	Quiz						
	Percent (%)	of In-term Studies		60			

Percentage of Final Exam to Total 1 40  Attendance

	2		Total Number of Weeks	Duration (weekly hour)			weekly		Total Period Work
		y Theoretical Course	14		2				Load 28
	Hours Weekl	y Tutorial Hours							
		ng Tasks							
	Studie	S							
		al Design and							
		nentation Preparing							
Workload		ing a Presentation	7			3			21
		tations	6			3			18
		m Exam and	1			4			4
		ation for m Exam							
		Exam and	1			4			4
		ation for Final Exam	_						•
		(should phasized)	-			-			-
		Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex engroblems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and			x	x		
		Ability to design a consystem, process, developer to the product under realist constraints and conditions as a such a way as to mee desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;			x		x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	х			
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		Х		
8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	х			
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.			х	
10	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	
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.	x			
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		x		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			x	

		Knowledge about awareness of the legal consequences of engineering solutions.				X	
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr						

Course Description Form							
Course Code and Name	ETM 230 – SEMIOLOGY AND SEMANTICS IN DESIGN						
Course Semester	4						
Catalog Content	Introduction and general description, The semiotic characteristics of design objects, Semiotic analysis process of industrial products, The conceptual prerequisites of product semantics, Relations between mental world and real world and the representation of product type, Concept of product, external appearance of the product, The content of the product image. Knowledge related to product, meaning of design, Functional, semantic structure of man-object-society system, Special content of concepts related to knowledge acquisition, meaning and representation. Product semantic profile, Structure in regard to semantics of the product image, firm image, user cultural group, Expressiveness in the design process and the forms of expressions. Context of products and typologies, Objects readability and its rules. Designing behaviour depending on the product semantics, Semantics analysis of elements of form. Semantics analysis of product external appearance, Semantic explanation of design behaviour, theories, tendencies and styles.						
Textbook	Hjelm, S.I., Semiotics in Product Design, Technical Report, Royal Institute of Technology, Stockhom, Sweden, 2002.  Krippendorff, K. (2005). The semantic turn: A new foundation for design. crc Press.						
Supplementary Textbooks	Silverman, K., The subject of Semiotics, New York: Oxford University Press, 1983						
Credit	3 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Selective						
Instruction Language	Turkish						
Course Objectives	To learn the subjects of sign and semantics in design, to gain the ability to apply, to understand the effect of indicators on the user and to understand the methodology of semantics, to gain the ability to apply in design						
Course Learning Outcomes	<ol> <li>Students attending this course learn basis of semiology and semantics in design.</li> <li>They can apply rules and methods of this course while making designs.</li> </ol>						
Instruction Methods	Face to face						

	1. Week						
	2. Week	The semiotic characteristics of design objects.					
	3. Week	Semiotic analysis process of industrial products.					
	4. Week	The conceptual prerequisites of	product	semantics.			
	5. Week	Relations between mental world representation of product type.	and real	world and the			
	6. Week	Concept of product, external ap	pearance	of the product			
	7. Week	The content of the product image product, meaning of design.	ge. Know	ledge related	to		
Weekly Schedule	8. Week	Functional, semantic structure o	f man-ob	ject-society sy	rstem.		
	9. Week	Special content of concepts rela meaning and representation. Pro			sition,		
	10. Week	Structure in regard to semantics image, user cultural group.	of the pr	oduct image, f	ĩrm		
	11. Week	Expressiveness in the design pro- expressions. Context of product					
	12. Week	Objects readability and its rules depending on the product seman		ng behaviour			
	13. Week	Semantics analysis of elements of form. Semantics analysis of product external appearance.					
	14. Week	Semantic explanation of design behaviour, theories, tendencies and styles.					
	Weekly tl	neoretical course hours: 2					
Teaching and Learning Methods	Weekly to	atorial hours: 0					
	Reading A	Activities: 10					
(These are examples. Please fill which activities you use in the course)	Internet b	rowsing, library work Designing a	and imple	ementing			
	materials	20					
	Report pr	eparing: 10					
	Preparing	a Presentation: 0					
	Presentati	ons: 0					
	Preparation	on of Midterm and Midterm Exam	n: 3				
	Final Exam and Preparation for Final Exam: 4						
		Nu	imbers	Total Weightin g (%)			
	Midtern	n Exams	1	40			
	Assignn		1	10			
	Applica Projects		1	10			
Assessment Criteria	Practice		1	10			
	Quiz						
	Percent of In-term Studies 60						

Percentage of Final Exam to Total Score (%)

40

Attendance		

	Activity		Total Number of Weeks	Duration (weekly hour)			(weekly		Total Period Work Load
		y Theoretical Course	14	,				28	
	Hours	y Tutorial Hours	14						20
	_	ng Tasks							
	Studie		4			5			20
		al Design and							
		nentation	4			5			20
Workload		Preparing							
, , or mond		ing a Presentation							
		tations m Exam and							
		ation for	1			3			3
		m Exam							
		Exam and ation for Final Exam	1			4			4
	Other	( should							
		phasized)							
	_	Workload	-			_			75
		Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcon	ies	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem	e and pertaining line; ical and in these olve				X		
	2	Ability to identify, for and solve complex e problems; ability to sapply proper analysis modeling methods for purpose.	ngineering select and s and				x		
		Ability to design a consystem, process, develocet under realist constraints and conditions as to meet desired result; ability modern design methological purpose.	ice or ic itions, in et the to apply					x	
		Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	es and nalysis and problems cations; ation					х	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		х		
8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	х	-		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

Course Description Form						
Course Code and Name	ETM 232 – FORM, MATERIAL AND FUNCTION					
Course Semester	4					
Catalog Content	Introduction, Function and personality, What influences product design, Design and designing, Multi-dimensional materials, Shaping, joining and surfaces, Applications, Form follows materials, A structure for material selection, Cases studies in material and design, Making designs which are compatible in terms of form, material and function, New materials – the potential for innovation.					
Textbook	Grillo, P.J., Form, Function and Design, Dover Pub., Can., 2010.  Ashby, M. and Johnson, K., Materials and Design – The Art and Science of Material Selection in Product Design, B-H Pub., 2010.					
Supplementary Textbooks	Form Follows Function Journal					
Credit	3 AKTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Selective					
Instruction Language	Turkish					
Course Objectives	Analyzing the relationship between form, function, material selection and production methods in design, creating composition using formal elements of design, developing ideas and manual skills to solve basic design problems.					
Course Learning Outcomes	Students who attend this course learn basis of form, material and function.  This course gives a different perspective to design problems					
Instruction Methods	Face to face					

	1.	Introduction							
	Week 2.	Function and personality							
	Week 3.	What influences product d	esian						
	Week								
	4. Week	Design and designing							
	5. Week	Multi-dimensional materia							
	6. Week	Shaping, joining and surface	ces						
	7. Week	Midterm exam							
Weekly Schedule	8. Week	Form follows materials							
	9. Week	Applications							
	10. Week	A structure for material sel							
	11. Week	Cases studies in material a	nd design						
	12. Week	Making designs which are and function	compatible in	terms of form	, material				
	13. Week	New materials – the potential for innovation							
	14. Week	Applications							
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	itorial hours: 0							
	Reading A	Activities: 12							
(These are examples. Please fill which activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing					
	materials:	23							
	Report pr	eparing: 10							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	_	on of Midterm and Midterm							
	Final Exa	m and Preparation for Final							
		Numbers Total Weightin g (%)							
	Midterm	lterm Exams 1 40							
		Assignment         1         10           Application         2         10							
	Application 2 10 Projects								
Assessment Criteria	Practice				1				
	Quiz	of In-term Studies		60	_				
	(%)			00					
	Percenta Score (%	nge of Final Exam to Total 6)		40	_				

Attendance		

Weekly Tutorial Hours			Activity	Total Number of Weeks	(w	ura veel	kly			Total Period Work Load
No				14			2			28
Reading Tasks										
Studies				2			6			12
Workload    Implementation   3   5   15     Report Preparing   3   2   6     Preparing a Presentation     Presentations     Midtern Exam and Preperation for   1   4   4     Midtern Exam and Preperation for   1   4   4     Midtern Exam   1   5   5     Total Workload   75     Total Workload   75										
Workload  Report Preparing 3 2 6 6 Preparing a Presentation Presentations Miderm Exam and Preperation for 1 4 4 4 Miderm Exam and Preperation for 1 1 5 5 5 Miderm Exam and Preperation for Final Exam 1 5 5 5 Miderm Exam and Preperation for Final Exam 1 5 5 5 Miderm Exam 1 5 Miderm Exam 1 5 5 5 Miderm Exam 1 5 Miderm Exam 1 5 5 5 Miderm Exam 1 5 Miderm Exam 2 Miderm Exam 1 5 Miderm Exam 1				3			-5			15
Preparing a Presentation   Presentations   Presentations   Presentations   Presentations   Presentations   Presentations   Presentations   Presentations   Preparation for 1										
Presentations  Midrem Exam and Prepresation for Midtern Exam Final Exam Final Exam and Final Exam and For Fi	Workload	_								0
Preparation for Midterm Exam   1										
Midterm Exam   Final Exam and   Preparation for Final Exam   1   5   5   5				4						
Final Exam and   Preperation for Final Exam   1   5   5     Other (should be emphasized)   75     Total Workload   25   75/2     Total Workload   25   75/2     Course Credit (ECTS)   3     No				1			4			4
Preperation for Final Exam Other (should be emphasized)  Total Workload 75  Total Workload 25  Course Credit (ECTS) 75/2  Course Credit (ECTS) 75/2  Total Workload 25  Course Credit (ECTS) 75/2  Total Workload 25  Total Workload 4 5  Total Workload 25  Total Workload 4 5  Total Workload 25  Total Workload 25  Total Workload 25  Total Workload 25  Total Workload 4 5	Final I	Exam and	1			-5			5	
De emphasized   Total Workload   75   75/2				-			_			
Total Workload / 25  Course Credit (ECTS)  No Program Outcomes  1 2 3 4 5  1 Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.  2 Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.										
Course Credit (ECTS)		Total V	Workload							75
No Program Outcomes 1 2 3 4 5  1 Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.  2 Ability to identify, formulate, and solve complex engineering problems, ability to select and apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.		Total V	Workload / 25							75/25
Contribution Level Between Course Learning Outcomes and Program Outcomes  2 Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.		Course								3
Contribution Level Between Course Learning Outcomes and Program Outcomes  2 Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.		No	Program Outcom	nes	1	2	3	4	5	
apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.			mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem  Ability to identify, for and solve complex e	e and pertaining pertaining pertaining pertaining pertaining pertaining pertaining pertaining pertaining pertaining pertaining						
product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.		3	apply proper analysis modeling methods for purpose.  Ability to design a co	s and or this omplex					x	
4 Ability to develop, select and   x			product under realist constraints and cond such a way as to mee desired result; ability modern design metho	ic itions, in et the to apply						
use modern techniques and tools necessary for analysis and solution of complex problems in engineering applications; ability to use information technologies effectively.		4	use modern technique tools necessary for a solution of complex in engineering applicability to use informations.	es and nalysis and problems cations; ation					х	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		х		
8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	х	-		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

	Course Description Form			
Course Code and Name	ETM 234 – COMPUTER GRAPHICS			
Course Semester	4			
Catalog Content	Introduction to graphics, Curves, Transformations, Coordinate-free geometry, 3D objects, Camera models, Visibility, Basic lighting and reflection, Shading, Texture mapping, Basic ray tracing, radiometry and reflection, Distribution ray tracing, interpolation, Parametric curves and surfaces, Animation.			
Textbook	Fleet, D. and Hertzman, A., Computer Graphics Lecture Notes, Computer Science Dept., University of Toronto, Canada, 2006.  Shirley, P. and Marschner, S., Fundamentals of Computer Graphics, Taylor & Francis Group, Int. Ed., 2010.			
Supplementary Textbooks	Journal of Computer Graphics Techniques Computer & Graphics - Journal			
Credit	3 ECTS			
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements			
Type of the Course	Elective			
Instruction Language	Turkish			
Course Objectives	To learn computer graphics topics and methods, to gain the ability to apply. To be able to design various graphic design applications and make them ready for printing in computer environment.			
Course Learning Outcomes  Students who attend this course learn topics and methods of computer graphics.  They can solve the problems related to computer graphics.				
<b>Instruction Methods</b>	Face to face			

	1. Week	Introduction	to graphics								
	2. Week	Curves									
	3. Week	Transformat	Γransformations								
	4. Week	Coordinate-	Coordinate-free geometry								
	5. Week	3D objects									
	6. Week	Camera mod	lels								
	7. Week	Visibility									
Weekly Schedule	8. Week	Basic lighting	ng and reflection								
	9. Week	Shading									
	10. Week	Texture map	pping								
	11. Week	Basic ray tra	acing, radiometry and reflection								
	12. Week	Distribution	ray tracing, interpolation								
	13. Week	Parametric c	curves and surfaces								
	14. Week	Animation									
	Weekly theo	oretical course	hours: 2								
Teaching and Learning Methods	Weekly tuto	rial hours: 0									
Trious and the second	Reading Act	ivities: 2									
	Internet brov	wsing, library	work Designing and implementing n	naterials: 0							
	Report prepa	aring: 1									
	Preparing a	Presentation:	1								
	Presentation	s: 1									
	Preparation	of Midterm ar	nd Midterm Exam: 10								
	Final Exam	and Preparation	on for Final Exam: 10								
			Numbers	Total Weighting (%)							
	Midterm E										
	Assignment Application										
Assessment Criteria	Projects	1 20									
Assessment Criteria	Practice Quiz										
	Percent of	of In-term 60									
	Studies (%	)									
	Percentage Exam to To			40							
	(%)										
	Attendance	•									

		Activity	Total Number of Weeks	Du (w ho	eel	kly			Total Perio Work Load
	Weekl Hours	y Theoretical Course	14	2					28
		y Tutorial Hours							
	Readir	ng Tasks							
	Studie	s	3			5			15
		al Design and	3			6			18
Workload		nentation t Preparing	<u> </u>						10
wor kioau	_	ing a Presentation	1			4			4
		tations	1			3			3
		m Exam and	1			3			2
	Midter	ation for m Exam	1			3			3
		Exam and ation for Final Exam	1			4			4
	Other	( should							
		ohasized) Workload	_			_			75
		Workload / 25							75/25
		e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem  Ability to identify, for	e and pertaining iline; ical and in these olve s.			X			
	2	and solve complex e problems; ability to s apply proper analysis modeling methods fo purpose.	ngineering select and s and			X			
		Ability to design a consystem, process, develocated product under realist constraints and conditions such a way as to meed desired result; ability modern design methor purpose.	ice or ic ic itions, in ot the v to apply				X		
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	es and nalysis and problems cations;		X				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

	Course Description Form
Course Code and Name	ETM 236 – DESCRIPTIVE GEOMETRY-II
Course Semester	4
Catalog Content	Introduction (description and importance of descriptive geometry), Traces, Traces of lines, Traces of planes, Piercing points, Intersections between planes, Parallelism and perpendicularity, Tilting, Affinity and collineation, Tangents, Vector operations, Projections based on elevation, Shadow and shadowing, General applications.
Textbook	Bayvas, Ş., Dericioğlu, N. ve Özgönül, O., Tasarı Geometri Temel Metot ve Uygulamalar I-II, Ankara, 1969. Hawk, M. C., Schaum's Outline Of Theory And Problems Of Descriptive Geometry, 1962 by McGraw-Hill, Inc.
Supplementary Textbooks	Computer-Aided Design
Credit	3 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	To learn the subjects and methods of design geometry Describe the definition and importance of draft geometry. To apply point, line, plane and body projections. Giving information about the projection and explaining the projection methods. Prisms, pyramids, cylinders, cones, spheres such as three-dimensional geometric shapes to draw the expansion. Subtract cross-sectional views of objects formed by cutting through a plane.
Course Learning Outcomes	Students who attend this course learn topics and methods of descriptive geometry.  They can solve advanced problems related to descriptive geometry.
Instruction Methods	Face to face

	1. Week	Introduction	(description and importance of	descriptive geometry)							
	2. Week	Traces									
	3. Week	Traces of line	Traces of lines								
	4. Week	Traces of pla	Traces of planes								
	5. Week	Piercing poir	nts								
	6. Week	Intersections	between planes								
	7. Week	Parallelism a	nd perpendicularity								
Weekly Schedule	8. Week	Tilting									
	9. Week	Affinity and	collineation								
	10. Week	Tangentes									
	11. Week	Vector opear	rtions								
	12. Week	Projections b	pased on elevation								
	13. Week	Shadow and									
	14. Week	General appl	ications								
	Weekly theo	retical course	hours: 2								
Teaching and Learning Methods	Weekly tuto	rial hours: 0									
Withous	Reading Act	ivities: 2									
	Internet brov	wsing, library v	work Designing and implement	ing materials: 0							
	Report prepa	aring: 1									
	Preparing a	Presentation: 1									
	Presentation	s: 1									
	Preparation	of Midterm an	d Midterm Exam: 10								
	Final Exam	and Preparatio	n for Final Exam: 10								
			Numbers	Total Weighting (%)							
	Midterm E	xams	1	30							
	Assignmen	ıt	1	10							
	Application	n	1	20							
Assessment Criteria	Projects Practice		1	20							
	Quiz										
	Percent of	In-term		60							
	Studies (%	)									
	Percentage	of Final		40							
	Exam to To (%)	otal Score									
	Attendance	s									
	Tittellinia										

		Activity	Total Number of Weeks	(w	ura ee our	kl	on y		Total Period Work Load
	Weekl Hours	y Theoretical Course	14		2			28	
	_	y Tutorial Hours							
	_	ng Tasks							
	Studie	s	3			6	<u> </u>		18
		al Design and	2			5	5		10
		nentation Preparing	1			6			6
Workload		ing a Presentation	2			2			4
	_	tations							'
	Midter	m Exam and							
		ation for m Exam	1			4	1		4
		Exam and	1			5	•		5
		ation for Final Exam	1			- 3	,		3
		( should phasized)							
		Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	3 4	. 5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and seengineering problem	e and pertaining line; ical and in these olve			x			
	2	Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	ngineering select and s and			X			
		Ability to design a consystem, process, developroduct under realist constraints and conditions such a way as to mee desired result; ability modern design methological modern design methological modern design methological modern design methological modern design methological met	ice or ic itions, in ot the v to apply				x		
		Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	es and nalysis and problems cations;		X				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 238 Portfolio Design							
Course Semester	4							
Catalog Content	A portfolio design course is a course for the theoretical and practical knowledge of preparing printed or digital documents for professional business or academic life applications. Graphic, Logo, Corporate identity, Learning of Illustrator program and application for digital portfolio, Digital and printed portfolio design, Resolution, Printing varieties							
Textbook	Markowitz, H. M. (1991). Foundations of portfolio theory. The journal of finance, 46(2), 469-477.							
Supplementary Textbooks	Rea, D. (2011). English Unlimited B1+-Intermediate/Coursebook with E-Portfolio							
Credit	2 Credit / 3 AKTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To prepare the printed and online portfolios that will facilitate the entry of the students into the professional business life, t to acquire knowledge and skills about portfolios and the Illustrator visualization program.							
Course Learning Outcomes	Getting information about portfolio     Ability to use the Illuminator program     Ability to design printed and digital portfolio     Learning of graphic design and digital design principles							
Instruction Methods	Face to face Practical training							

	1.	Portfolio Design, how it works with samples						
	Week 2.	Compiling works that they can put on their portfolio,						
	Week	evaluation						
	3. Week	Establishment and evaluation of corporate identity for portfolio design						
	4. Week	Clarification of logo design and corporate identity design by sketch						
	5. Week	Creating their own digital Portfolio layout - Detailing						
	6. Week	Information about the illustrator program - introduction – basic commands						
	7. Week	Teaching the illustrator program - submenu - practice						
Weekly Schedule	8. Week	Continuing to teach the illustrator program – creating graphics - application						
	9. Week	Graphic Application (Corporate Identity and Poster)						
	10. Week	Continuing to teach the illustrator program – Digital creation of corporate identity						
	11. Week	Continuing to teach the illustrator program – Begin to create digital portfolios						
	12.	Applying Digital Portfolios						
	Week 13. Week	Completion of Digital Portfolio						
	14.	Giving and applying the theoretical information for the						
	Week	printed portfolio						
	Weekly th	heoretical course hours: 2						
Teaching and Learning Methods	Weekly to	utorial hours: 0						
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 5						
	Internet b materials:	prowsing, library work Designing and implementing : 12						
	Report pr	reparing: 5						
	Preparing	g a Presentation: 5						
	Presentati	ions: 5						
		on of Midterm and Midterm Exam: 5						
	Final Exa	am and Preparation for Final Exam: 5						
		Numbers Total Weightin g (%)						
		n Exams 1 40						
	Assignment 2 20							
Assessment Criteria	Projects							
Assessment Criteria	Practice							
	Quiz Percent	of In-term Studies						
	(%)							

Percentage of Final Exam to Total Score (%)	1	60
Attendance		

		Activity	Total Number of Weeks	(v	ura vee our	kl			Tota Perio Worl Load	d k
		y Theoretical Course	14	2				28		
	Hours	y Tutorial Hours	17						20	_
		ng Tasks	5	2		10	_			
	Studie		5				2 2		10	
		al Design and	-						10	_
		nentation	7				1		7	
Wada J	Report	Preparing								
Workload	Prepar	ing a Presentation	5				1		5	
		tations	5				1		5	
		m Exam and ation for	1				_		_	
		m Exam	1				5		5	
		Exam and	1				5		5	
		ation for Final Exam ( should	•							_
		ohasized)								
	Total V	Workload							75	
	Total V	Workload / 25							3	_
	Course	e Credit (ECTS)							3	
	No	Program Outcom	nes	1	2	3	3 4	5		
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem  Ability to identify, for	e and pertaining pline; ical and in these olve ss.			x			_	
	2	and solve complex e problems; ability to s apply proper analysis modeling methods fo purpose.	ngineering select and s and			X				
		Ability to design a consystem, process, develocet under realist constraints and conditions are under a way as to meet desired result; ability modern design methor purpose.	ice or ic itions, in et the / to apply				x			
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applica ability to use informate technologies effective	es and nalysis and problems cations; ation		x					

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

		Knowledge about awareness of the legal consequences of engineering solutions.		x	
The Course's Lecturer(s) and Contact Informations	,	Or. İsmail Şahin n@gazi.edu.tr			

	Course Description Form
Course Code and Name	ETM 320 - MEDICAL DEVICE DESIGN
Course Semester	6
Catalog Content	Medical device design process, stress analysis, anatomical suitability and forms of shape and size, choice of biomaterials; instrumentation of surgical implantation procedures, pre-clinical testing for safety and efficiency, orthopedic devices, soft tissue implants, and information in the areas artificial organs, and dental implants.
Textbook	<ul> <li>- Bronzino, J.D., The Biomedical Engineering HandBook, IEEE Press, 1995</li> <li>- Biomedical Engineering Health Care Systems, Technology and Techniques, Suh, S.C., Gurupur, V.P., Tanik, M.M.</li> </ul>
Supplementary Textbooks	Ogrodnik, P. (2012). Medical Device Design, Innovation from concept to market. Academic Press/Elsevier.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To introduce electrical and mechanical devices used in medical sector and develop general understanding of principles in medical device design, environmental conditions, security etc.
Course Learning Outcomes	- Students who attend this course learn basis of medical device designThey can apply knowledge of this course while designing medical devices.
Instruction Methods	Expression

	1. Week	Basic Principles of Medical							
	2. Week	Electrical and mechanical d	evices used in	n medicine gro	oups				
	3. Week	Minimally invasive medical	device desig	n					
	4. Week								
	5. Week	Design of devices for bedsic	de diagnostic	technology					
	6. Week	Design of devices for measu		radiation dose					
Weekly Schedule	7. Week	Sensor, biosensor technolog	gies						
	8. Week	Sensor, biosensor technolog	gies						
	9. Week	The design of home health of	care and patie	ent monitoring	devices				
	10. Week	Portable diagnostic and then	rapeutic devic	ces					
	11. Week	Portable early diagnosis dev	vices						
	12.	Micro total analysis systems	S						
	Week 13. Week	Integrated bio-chips (Lab or	n a chip)						
	14. Week	Application							
	15. Week								
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly to	utorial hours: -							
(These are examples. Please fill which activities you use in the course)		Activities: 5							
	Internet b	rowsing, library work Design: : 12	ing and imple	ementing					
	Report pr	eparing: 0							
	Preparing	g a Presentation: 0							
	Presentat	ions: 0							
		on of Midterm and Midterm E							
	Final Exa	m and Preparation for Final E	Numbers	Total					
				Weightin g (%)					
	Midtern Assignn	n Exams	1	40 20					
	Applica	1	1	20					
Assessment Criteria	Projects								
	Practice Quiz								
	Percent	of In-term Studies		60					
	(%)								

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w	ura /ee our	kly			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours	y Tutorial Hours							-
		ng Tasks	5			3			15
	Studies		6			2			12
		al Design and							
		nentation	4			4			16
88711 J	Report	t Preparing							
Workload	Prepar	ring a Presentation							
		tations							
	Midterm Exam and Preperation for		1	2			2		
		rm Exam	1			_			2
		Exam and	1			2			2
		ration for Final Exam ( should							-
		phasized)							
	Total V	Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
	1	Adequate knowledge	e in			X			_
		mathematics, science							
		engineering subjects to the relevant discip							
Contribution Level Between Course Learning		ability to use theoret							
Outcomes and Program Outcomes		applied information							
		areas to model and so							
		engineering problem	S.						
		Ability to identify, for	vernulata				$\perp$		-
	2	and solve complex e						X	
		problems; ability to s	select and						
		apply proper analysis							
		modeling methods for purpose.	or this						
		purpose.							
	3	Ability to design a co	omplex			x	+	-	-
		system, process, dev	ice or			-			
		product under realist							
		constraints and cond							
		such a way as to mee desired result; ability							
	modern design methods for t								
		purpose.							
		Ability to develop, so	elect and				+	X	-
	4	use modern techniqu						Λ	
		tools necessary for a	nalysis and						
		solution of complex	nrohlems	l			1	1	İ
		in engineering applic	ations;						
			eations; ation						

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
6	Ability to work efficiently in intra-disciplinary teams.			X	
7	Ability to work efficiently in multi-disciplinary teams.	Х			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		X		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

		Knowledge about awareness of the legal consequences of engineering solutions.		X		
The Course's Lecturer(s) and Contact Informations	•	tment Management im@gazi.edu.tr				

	Course Description Form
Course Code and Name	ETM 321 - Mechatronics System Design
Course Semester	5
	Introduction to Machatronics System Design, The design processes, Block diagrams, Manipulations and Simulation, Electrical, mechanical and fuid systems and systems coupling, Sensors and transducers, Sensor Applications, Actuating devices, System Control – Logic Methods, Programmable Logic Controllers, Signals, Systems and Controls, Laplace Transfor Solutions of Ordinary Differential Equations, Signal Conditioning and Real time interfacing, Data Conversion Process, Case Studies
Textbook	Shetty, D., Kolk R.A., Mechatronics System Design, Cengage Learning, 2011 Bradley, D. A., Seward, D., Dawson, D., & Burge, S. (2018). Mechatronics and the design of intelligent machines and systems. Crc Press.
Supplementary Textbooks	Pelz, G., & Waddington, R. (2004). Mechatronic systems. J. Wiley.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To introduce the students to all the topics needed to develop a good understanding of the basic principles used in mechatronics technology.
Course Learning Outcomes	At the end of this course students will be equipped with all the tools necessary to plan, test, and implement a well-designed mechatronic system
Instruction Methods	Expression

	1. Week	Introduction to Machatroni	cs System De	sign			
	2. Week	The design processes					
	3. Week	Block diagrams, Manipulations and Simulation					
	4. Week	Electrical, mechanical and coupling	fuid systems a	and systems			
	5. Week	Sensors and transducers					
	6. Week	Sensor Applications					
	7. Week	Actuating devices					
Weekly Schedule	8. Week	System Control – Logic Mo	ethods				
	9. Week	Programmable Logic Contr	ollers				
	10. Week	Signals, Systems and Contr	rols				
	11. Week	Laplace Transfor Solutions Equations	of Ordinary I	Differential			
	12. Week	Signal Conditioning and Ro	eal time interf	acing			
	13. Week	Data Conversion Process					
	14. Week	Case Studies					
	15. Week						
	Weekly tl	neoretical course hours: 2					
Teaching and Learning Methods	Weekly to	utorial hours: -					
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 6					
uctivities you use in the course)	Internet b	rowsing, library work Design	ing and imple	ementing			
	Report pr	eparing: 0					
	Preparing a Presentation: 0						
	Presentations: 0						
	Preparation of Midterm and Midterm Exam: 4						
	Final Exa	m and Preparation for Final I	Exam: 4				
			Numbers	Total Weightin g (%)			
		n Exams	1	40			
	Assignn		1	20			
	Applica Projects						
Assessment Criteria	Projects						
	Practice Quiz						

Percentage of Final Exam to Total Score (%) Attendance	(0/)	rcent of In-term Studies		60
Attendance	Per	recentage of Final Exam to Total	1	40
	Att	rendance		

Weekl Hours Weekl Readir Studie		14			)			Work Load
Weekl Readir		14		2				28
Readir	v Tutorial Hours							
		3			3			9
		5			2			10
	al Design and	4			5			20
	mentation	-						
Preper	ation for	1			4			4
Preper	ation for Final Exam	1			4			4
		=			_			75
Total V	Workload / 25							75/25
Course	e Credit (ECTS)							3
No	Program Outcom	nes	1	2	2	1	5	
1	mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sc engineering problem	e and pertaining line; ical and in these plye s.					х	
2	and solve complex en problems; ability to sapply proper analysis	ngineering select and s and				x		
3	system, process, dev- product under realist constraints and cond such a way as to mee desired result; ability	ice or ic ic itions, in ot the to apply			X			
4	use modern techniqu tools necessary for a solution of complex in engineering applicability to use informa	es and nalysis and problems rations; ation				x		
	Prepar Presen Midter Preper Midter Final I Preper Other be em Total V Course  2	1 Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information is areas to model and seengineering problem.  2 Ability to identify, for and solve complex engroblems; ability to sapply proper analysis modeling methods for purpose.  3 Ability to design a consystem, process, deviproduct under realist constraints and conditions such a way as to mee desired result; ability modern design method purpose.  4 Ability to develop, so use modern technique tools necessary for an solution of complex in engineering applicability to use informations.	Preparing a Presentation  Presentations  Midterm Exam and Preperation for 1 Midterm Exam Final Exam and Preperation for Final Exam  Other (should be emphasized)  Total Workload / 25  Course Credit (ECTS)  No Program Outcomes  1 Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.  2 Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.  3 Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose.	Preparing a Presentation  Presentations  Midterm Exam and Preperation for I Midterm Exam  Final Exam and Preperation for Final Exam  Other ( should be emphasized)  Total Workload	Preparing a Presentation Presentations  Midterm Exam and Preperation for	Preparing a Presentation Presentations  Midterm Exam and Preperation for	Preparing a Presentation  Presentations  Midterm Exam and Preperation for 1 4  Midterm Exam  Final Exam and Preperation for Final Exam 1 4  Other (should be emphasized)  Total Workload	Preparing a Presentation  Presentations  Midterm Exam and Preperation for 1 4  Midterm Exam 1 1 4  Preperation for Final Exam 1 1 4  Other ( should be emphasized)  Total Workload

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.			X		
6	Ability to work efficiently in intra-disciplinary teams.		X			
7	Ability to work efficiently in multi-disciplinary teams.	Х				
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.				х	
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			x		
12	Knowledge on practices in business, such as project management, risk management and change management.				X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X			

		Knowledge about awareness of the legal consequences of engineering solutions.	2	K		
The Course's Lecturer(s) and Contact Informations	•	tment Management im@gazi.edu.tr				

	Course Description Form
Course Code and Name	ETM 322– FURNITURE DESIGN
Course Semester	6
Catalog Content	The general approach in design of furniture, Indoor and outdoor furnite conepts, Furniture-user relationships, Furniture design determining visions, technologies, reflections for design
Textbook	Remmele, M., Charles and Ray Eames/ Objects and Furniture, Monacelli Yayınevi, 2007  Küçükerman, Ö., Endüstri İçin Ürün Tasarımında Yaratıcılık, Yem Yayınları, İstanbul
Supplementary Textbooks	Beyazıt, N., Endüstri Ürünlerinde ve Mimarlıkta Tasarlama Metotlarına Giriş, Literatür Yayıncılık Habegger, J., Sourcebook of Modern Furniture, W.W. Norton Yayınevi, 2005
Credit	3 AKTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Selective
Instruction Language	Turkish
Course Objectives	Producing innovative and creative concepts in furniture design considering cultural, social and environmental factors and the needs and desires of users; establishing a research methodology for furniture design; a creative approach to defining the problem of furniture design; developing strategies to create design solutions to these problems through furniture design systems, functional coordination and corporate identity; developing potential uses of the created product in line with future needs.
Course Learning Outcomes	Topical approach to furniture design discipline, mastering modern and historical examples
Instruction Methods	Face to face

1. The scope of the furniture and discussion in gener  Week 2. Structural classification of furniture  Week 3. Paris fortuge describing a furniture Structure E	
Week	al
3. Basic features describing a furniture: Structure, Formula Week Material, Measurement, Surface	ormat,
4. Systematic forming in furniture design: Structure Shape variables	variables,
5. Format search, Synthesis format: Structure and Sh Week variables, Factors affecting the format indirectly	ape
6. Product synthesis and problem analysis Week	
7. Format search according to general material properties.	erties
8. Identity and personality problems in furniture Week	
Weekly Schedule  9. The material conditions encountered in the design furniture: General characteristics of Material – Fo - Material relations, Production methods - Design material relations	rm, Form
Week  Discussion and analysis of Furniture in terms of H element relations: Spread of body height accordin seating positions in sitting elements, The spine an relative to the human body position, Seating element Height - Angle - Area relations	g to gles
11. Functions in furniture design and function dressin Week Practical Functions, Symbolic Function, Aesthetic	
12. Literal values in furniture design, changing behav	iors
13. Furniture - Furniture relations Week	
14. The scope of the furniture and general discussions Week	1
Weekly theoretical course hours: 2 Weekly tutorial hours: 0	
Reading Activities: 8	
Teaching and Learning Methods Internet browsing, library work Designing and implementing	
These are examples. Please fill which materials: 25	
Report preparing: 6	
Preparing a Presentation: 0  Presentations: 0	
Preparation of Midterm and Midterm Exam: 3	
Final Exam and Preparation for Final Exam: 4	
	tin
Numbers Tota Weigh	·)
	<u>)</u>
Midterm Exams 1 40 Assignment	<u>)                                    </u>
Weigh g (% Midterm Exams 1 40 Assignment Application	o) 
Midterm Exams 1 40 Assignment	) 

Percent of In-term Studies	60
(%)	
Percentage of Final Exam to Total Score (%)	40
Attendance	
Attendance	
•	

		Activity	Total Number of Weeks	(w	ura veel our	kly			Total Period Work Load
		y Theoretical Course	14	2		28			
	Hours	y Tutorial Hours							
		ng Tasks	2			3			6
	Studie		3			5			15
		al Design and							
		nentation	2			5			10
	Report	Preparing	2			3			6
Workload	Prepar	ing a Presentation							
	Presen	tations							
	Preper	m Exam and ation for	1			5			5
		m Exam							
		Exam and ation for Final Exam	1			5			5
	Other	( should							
		phasized)							75
		Workload / 25	-			-			75
		Workload / 25 e Credit (ECTS)							75/25
		Program Outcom	nes						3
	No	Frogram Outcom	168	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and seengineering problem  Ability to identify, for and solve complex en	e and pertaining perta				x		
	3	problems; ability to sapply proper analysis modeling methods for purpose.	select and s and or this					v	
		Ability to design a consystem, process, deviproduct under realist constraints and conditions are to meet desired result; ability modern design methor purpose.	ice or ic itions, in et the v to apply					X	
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informate technologies effective	es and nalysis and problems cations; ation					х	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		х		
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.		х		
10	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.	Х			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

Course Description Form					
Course Code and Name	ETM 323 – DESIGN FOR MANUFACTURABILITY				
Course Semester	5				
Catalog Content	Introduction, The design of product components, Evaluation of product components in terms of mechanical design, Materials and material selection, Standard parts and fasteners, Manufacturing technologies, Mechanical and electro-mechanical mechanisms, Assembly methods, Processes to change the components' physical properties and appearance, Quality control methods, The influence of the chosen manufacturing method and material upon design, Factors influencing the manufacturing method choices, Systems for controlling design and manufacturing methods, Design examples.				
Textbook	Bralla, J.G., Design for Manufacturability Handbook, Mc-Graw Hill Pub., 1998.  Anderson, D.M., Design for Manufacturability: How to Use Concurrent Engineering to Rapid Develop Low-Cost, High-Quality Products for Lean Production, CRC Press, USA, 2014.				
Supplementary Textbooks	Research in Engineering Design  Int. Journal of Design Engineering				
Credit	3 AKTS				
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements				
Type of the Course	Selective				
Instruction Language	Turkish				
Course Objectives	Determining the criteria of design suitable for manufacturing, obtaining detailed information about manufacturing methods, determination of limitations and difficulties, understanding the relationship between material and manufacturing				
Course Learning Outcomes	1.Students who attend this course learn topics and methods of design for manufacturability.      2.They can apply rules and methods of this course while designing machines, so they can make designs based on scientific bases and methodical rules.				
Instruction Methods	Face to face				

	1.	Introduction								
	Week  2. Week	The design of product com	ponents.							
	3. Week	1 1								
	4. Week									
	5. Week	1								
	6. Week	Manufacturing technologie								
	7. Week	Mechanical and electro-me	echanical mech	nanisms.						
Weekly Schedule	8. Week	Assembly methods.								
	9. Week	Processes to change the coappearance.	mponents' phy	ysical properti	es and					
	10. Week	Quality control methods.								
	11. Week	The influence of the chosen upon design.	n manufacturii	ng method and	l material					
	12. Week	Factors influencing the ma	nfluencing the manufacturing method choices.							
	13. Week	Systems for controlling design and manufacturing methods.								
	14. Week	Design examples.								
	Weekly th	neoretical course hours: 2								
Teaching and Learning Methods	Weekly tu	ntorial hours: 0								
	Reading A	Activities: 10								
(These are examples. Please fill which activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing						
	materials:	23								
	Report pro									
		a Presentation:								
	Presentati		_							
	1	on of Midterm and Midterm								
	Final Exa	m and Preparation for Final 1		T	1					
			Numbers	Total Weightin g (%)						
	Midterm		1	40	]					
	Assignment Application									
Assessment Criteria	Projects		2	20	1					
	Practice Quiz				-					
		of In-term Studies		60	-					
		ge of Final Exam to Total		40						

Attendance		

		Activity	Total Number of Weeks	(w	ura eel	kly			Total Period Work Load
	Weekl Hours	y Theoretical Course	14			2			28
		y Tutorial Hours							
		ng Tasks	2	4					8
		S	3			5			15
		al Design and	2			6			12
	_	nentation							
Workload	_	Preparing	1			5			5
*** OI RIOAU		ing a Presentation							
		tations							
		m Exam and ation for	1			3			3
	Midter	m Exam	<u>.</u>						J
		Exam and	1			4			4
		ation for Final Exam ( should							
	be emp	phasized)							
		Workload	-			-			76
	Total V	Workload / 25							76/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and seengineering problem  Ability to identify, for and solve complex en	e and pertaining line; ical and in these olve s.  ormulate, ngineering				x		
	3	problems; ability to sapply proper analysis modeling methods for purpose.  Ability to design a consystem, process, development of the product under realist	omplex ice or					X	
	4	constraints and cond such a way as to mee desired result; ability modern design methor purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applications.	elect and es and nalysis and problems					X	
		in engineering applic ability to use informa technologies effectiv	ation						

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		х		
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.		х		
10	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.	Х			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

Course Description Form						
Course Code and Name	ETM 324 - Cost-Efficient Design					
Course Semester	5-6					
Catalog Content	Introduction, Cost Responsibility of the Product Developers, Cost Management for Product Development, Methodology and Organization of Cost Management for Product Development, Applications, Influencing the Lifecycle Costs, Influencing the Total Costs, Factors that influence Manufacturing Costs and Procedures for Cost Reduction, Fundamentals of Cost Accounting for Product Development, Early Identification of Costs during Product Development – Development-Concurrent Cost Calculations, A general design example.					
Textbook	<ol> <li>Ehrlenspiel, K., Kiewert, A. and Lindemann., U, Cost-Efficient Design, Springer Pub., Int. Ed., 2007.</li> <li>Kamm L.J., Designing Cost-Efficient Mechanisms, McGraw Hill Pub., Int. Ed., 1990.</li> </ol>					
Supplementary Textbooks	Research in Engineering Design     Int. Journal of Computer-Aided Engineering					
Credit	3 ECTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Elective					
Instruction Language	Turkish					
Course Objectives	Determination of economic design criteria, role and importance of cost in design criteria, learning price performance evaluation analysis					
Course Learning Outcomes	Students who attend this course learn basis of cost-efficient design.     They can make better, cheaper and more efficient desigs by using knowledge gained in this course.					
<b>Instruction Methods</b>	Face to face Practical training					

	1. Week	Introduction					
	2. Week	Cost responsibility of the	product de	velopers			
	3. Week						
	4. Week						
	5. Week	Applications					
	6. Week	Influencing the lifecycle	cost				
	7. Week	Influencing the total costs					
Weekly Schedule	8.	Case study					
	Week 9.	Factors that influence ma	nufacturing	costs and			
	Week	procedures for cost reduc					
	10. Week	Applications					
	11. Week	Fundamentals of cost accidevelopment	counting for	product			
	12.	Applications					
	Week 13.						
	Week	- development-concurrent cost calculations					
	14. Week	Applications					
	15.						
	Week						
	Weekly th	neoretical course hours: 2					
Teaching and Learning Methods	Weekly to	ntorial hours: -					
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 6					
activities you use in the course)	Internet b	rowsing, library work Design	ing and imple	ementing			
	Report pr	eparing: 0					
	Preparing	a Presentation: 0					
	Presentati	ons: 0					
	Preparation	on of Midterm and Midterm E	Exam: 4				
	Final Exa	m and Preparation for Final E	Exam: 4				
			Numbers	Total Weightin g (%)			
	Midtern		1	30			
	Assignn Applica		1	30			
	Projects		1	30			
Assessment Criteria	Practice						
	Quiz						

	Percent of In-term Studies		
	(%) Percentage of Final Exam to Total Score (%)	1	40
$\vdash$	Score (%) Attendance	1	
ı	Attendance		

		Activity	Total Number of Weeks	(w		atio kly ')			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours Weekl	y Tutorial Hours							
		ng Tasks	3			2			6
	Studie		5			2			10
		al Design and	4			6			24
		mentation	<u> </u>						
Workload		Preparing ing a Presentation							
		tations							
		m Exam and							
	Preper	ation for	1			3			3
		m Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		(should phasized)	14			2			28
		Workload	_			_			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and		x	x			
	4	Ability to design a consystem, process, developer to the product under realist constraints and conditions are used as a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;				x		

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		X	
6	Ability to work efficiently in intra-disciplinary teams.		Х	
7	Ability to work efficiently in multi-disciplinary teams.	х		
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	
10	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	
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.	х		
12	Knowledge on practices in business, such as project management, risk management and change management.	X		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.	X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	х		

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr

Course Description Form						
Course Code and Name	ETM 325 – COST ANALYSIS IN DESIGN					
Course Semester	5					
Catalog Content	Supply and Demand, Individual and market demand, Temporary, short and long-term cost analysis, utility theory, Introduction to cost theory, Total, average and marginal costs, fixed and variable costs, Functional costs of firms, Cost - Volume - Profit Analysis, Scale economies, Exact Competition, Monopoly and Accidental Competition Markets					
Textbook	Gündüz, H.E., Gürdal, K. ve Elmacı, O., Maliyet Analizleri, Anadolu Üniversitesi, 2013.  Evans, J. R., Olson, D. L., & Olson, D. L. (2007). Statistics, data analysis, and decision modeling. Pearson/Prentice Hall.					
Supplementary Textbooks	Blank, L., & Tarquin, A. (2005). Engineering economy. McGraw-Hill.					
Credit	3 AKTS					
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Selective					
Instruction Language	Turkish					
Course Objectives	To enable students evaluate economical conditions and market structure during the design process. To impart ability to syntesize and perform rational, abstract analysis.					
Course Learning Outcomes	At the end of this course, graduate students can analyze and calculate the cost of a product, depending on economical conditions and market structure, during its design.					
Instruction Methods	Face to face					

	1. Week	Definition of Supply and I	Demand						
	2.	Flexibility of Supply and I	Demand						
	Week 3.	Temporary, short and long	neriods						
	Week								
	4. Week	Week							
	5. Week	Introduction to the cost the							
	6. Week	Cost Analysis Applications		and vanishla agets					
	7. Week	Total, average and margina		and variable costs					
Weekly Schedule	8. Week	Companies functional cost							
	9. Week	Cost - Volume - Profit Ana							
	10. Week	Short-and long-term cost a	nalysis						
	11. Week	Economies of Scale	nomies of Scale						
	12. Week	Markets: Perfectly Compet							
	13. Week	Monopoly and Imperfect N							
	14. Week	Applications							
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	ntorial hours: 0							
	Reading A	Activities: 0							
(These are examples. Please fill which activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing					
	materials:								
	Report pro								
	1 0	a Presentation: 0							
	Presentati								
	_	on of Midterm and Midterm							
	Final Exa	m and Preparation for Final		l m					
			Numbers	Total Weightin g (%)					
	Midterm		1	40					
	Assignm Applicat								
Accessment Cuitoria	Projects		2	20					
Assessment Criteria	Practice								
	Quiz Percent (%)	of In-term Studies		60					
		ge of Final Exam to Total 6)		40					

Attendance		

		Activity	Total Number of Weeks	(w	ura vee our	kly			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours Weekl	y Tutorial Hours							
		ng Tasks							
	Studie		3			4			12
		al Design and	4			5			20
		nentation t Preparing	2			3			6
Workload		ing a Presentation							0
		tations							
	Midter	m Exam and							
		ation for m Exam	1			5			5
		Exam and	1						-
		ation for Final Exam	1			5			5
		( should phasized)							
		Workload	-			-			76
	Total V	Workload / 25							76/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem  Ability to identify, for and solve complex e problems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and				x		
	4	Ability to design a consystem, process, developer to under realist constraints and conditions are desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;					x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		X		
7	Ability to work efficiently in multi-disciplinary teams.		х		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

	Course Description Form
Course Code and Name	ETM 326 – Plastic Mold Design
Course Semester	6
Catalog Content	Injection molding, extrusion, blow molding, rotational molding, thermoforming, compression molding technologies for thermoplastiscs and thermosets plastics, Mold manufacturing for plastic parts, and reporting Factory visiting
Textbook	Donald V. Rosato Plastics Technology Handbook, Vol. 2 2011     D.V. Rosato, Marlene G. Rosato Injection Molding Handbook - 2 Volume Set
Supplementary Textbooks	Plastics manufacturing system engineering, D. Kazmer, 2009.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Giving the fundamental molding technologies for plastic part production. To learn volume mold techniques, production methods and design
Course Learning Outcomes	Learning basic technologies in plastic part manufacturing.
Instruction Methods	Expression

	1. Week	Plastic material properties						
	2. Week	Plastic material properties						
	3. Week	Considerations in the Desig	gn of Plastic In	njection Mould				
	4. Week	8 8						
	5. Week							
	6. Week	Runner Pull Pin, Push Pin Cam Systems and Operatin						
	7. Week	Hot Runner Systems and U	ser's Goals, a	ir ducts				
Weekly Schedule	8. Week	Conversion Seals, Brands,						
	9. Week	Recruitment Available Mat	erial Selection	n				
	10. Week	The materials used in meta	l injection mo	lding				
	11. Week	Comparison of metal inject injection mold	ion molding a	and plastic				
	12. Week	The general acteristics of blow molding and extrusion mold						
	13. Week	E						
	14. Week							
	Weekly th	neoretical course hours: 2						
Teaching and Learning Methods		utorial hours: -						
(These are examples. Please fill which		Activities: 6						
activities you use in the course)		rowsing, library work Desigr	ing and imple	ementing				
		eparing: 0						
		g a Presentation: 0						
	Presentati							
			Evam: 1					
	Preparation of Midterm and Midterm Exam: 4  Final Exam and Preparation for Final Exam: 4							
	1 mai Exa	an and Freparation for Fillat I	Numbers	Total Weightin				
	Midtern	<b>g (%)</b> 40						
	Assignment 1 20							
	Application Projects							
Assessment Criteria	Practice							
	Quiz							

Percentage of Final Exam to Total Score (%) Attendance	(0/)	rcent of In-term Studies		60
Attendance	Per	recentage of Final Exam to Total	1	40
	Att	rendance		

		Activity	Total Number of Weeks	(w		atio kly ')			Total Period Work Load
		y Theoretical Course	15			2			28
	Hours Weekl	y Tutorial Hours							
		ng Tasks	3			4			12
	Studie		5			3			15
		al Design and	5			2			10
		nentation t Preparing							10
Workload		ing a Presentation							
		tations							
		m Exam and							
	Preper	ation for	1			3			3
		m Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		( should phasized)							
		Workload	-			_			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and seengineering problem.  Ability to identify, for and solve complex engroblems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and				x	X	
	4	Ability to design a consystem, process, deviproduct under realist constraints and conditions are used as a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;			X		X	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	х			
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.	х			
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		
10	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	
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			х	
12	Knowledge on practices in business, such as project management, risk management and change management.	х			
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	х			

		Knowledge about awareness of the legal consequences of engineering solutions.	2	K		
The Course's Lecturer(s) and Contact Informations	•	tment Management im@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 327 – Sheet Metal Mold Design							
Course Semester	5							
Catalog Content	Introduction, Basic die design, Die-work influencing factors, The theory of sheet metal behaviour, Metal stamping dies and their function, Metal stamping dies, their construction, and assembly, Die examples, Metalworking machinery, Blanking and piercing operations, Bending and forming operations, Drawn part examples, Practical die design, Die process quality and maintenance.							
Textbook	<ol> <li>Such, I., Handbook of Die Design, Mc-Graw Hill Pub., 2006.</li> <li>Boljonovic, V., Die Design Fundamentals, Industrai Prss, 2005.</li> </ol>							
Supplementary Textbooks	Research in Engineering Design     Int. Journal of Design Engineering							
Credit	3 ECTS							
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Elective							
Instruction Language	Turkish							
Course Objectives	To learn the issues of sheet-metal mold design, to gain the ability to apply. In this course, it is aimed to gain the knowledge and skills of making multi-step sheet-metal molds suitable for the technique.							
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of die design.</li> <li>They can make better sheet-metal die desigs based on knowledge of this course.</li> </ol>							
Instruction Methods	Face to face							

	1. Week	Introduction						
	2. Week	Basic die de						
	2. WCCK	Dasie die de	sign					
	3. Week	Die-work in	fluencing factors					
	4. Week	The theory	of sheet metal behavior					
	4. WEEK	The medry (	of sheet metal behavior					
	5. Week	Metal stamp	ing dies and their function					
	6. Week	Metal stamp	ing dies, their construction, and ass	sembly				
	7. Week	Die example						
Weekly Schedule	8. Week		ng machinery					
,, com, semenare			,					
	9. Week	Blanking an	d piercing operations					
	10.	Blank calcu	lation or flat layout					
	Week 11.	Danding one	1 forming operations					
	Week	bending and	forming operations					
	12.	Drawn part	examples					
	Week 13.	Practical die	e design					
	Week		_					
	14. Week	Die process	quality and maintenance					
	Weekly theo	retical course	hours: 2					
Teaching and Learning Methods	Weekly tuto	rial hours: 0						
Withous	Reading Act	ivities: 2						
	Internet brov	wsing, library	work Designing and implementing	materials: 0				
	Report prepa	aring: 1						
	Preparing a	Presentation:	1					
	Presentation	s: 1						
	Preparation	of Midterm ar	nd Midterm Exam: 10					
	Final Exam	and Preparation	on for Final Exam: 10					
			Numbers	Total Weighting (%)				
	Midterm E		1	30				
	Assignment Application							
Assessment Cuitoria	Projects		1	20				
Assessment Criteria	Practice							
		Quiz Percent of In-term						
	Studies (%	)		60				
	Percentage Exam to To		1	40				
	(%)		1	40				
	Attendance	·						

		Activity	Total Number of Weeks	(w	ura vee our	kly			Total Period Work Load
		y Theoretical Course	14	2			28		
	Hours Weekl	y Tutorial Hours							
	Readir	ng Tasks							
	Studie		5			4			20
		al Design and	2			5			10
	_	nentation Preparing	2			5			10
Workload		ing a Presentation	2						10
		tations							
		m Exam and							
		ation for	1			3			3
		rm Exam Exam and							_
	Preper	ation for Final Exam	1			4			4
		( should phasized)							
		Workload	_			_			75
		Workload / 25							75/25
		e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and seengineering problem.  Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining poline; ical and in these olve s.  ormulate, ngineering select and s and or this			x			
	4	Ability to design a consystem, process, deviproduct under realist constraints and conditions are used as a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in a preimagning and in	ice or ic itions, in et the v to apply ods for this elect and es and nalysis and problems		X		х		
		in engineering applic ability to use informa technologies effectiv	ation		Α.				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact	Prof. Dr. Adnan AKKURT
Informations	aakkurt@gazi.edu.tr

Course Description Form							
Course Code and Name	ETM 340 – AUTOMOTIVE DESIGN						
Course Semester	6						
Catalog Content	Introduction, Design process Overview, Functional Objectives, systems and market segments, Size and Proportion, Interiors and Cargo, Powertrains, Wheels and tires, Suspension and Chassis, Bodies, Aerodynamics, Safety and crash regulations, Mobility, Design Excercises						
Textbook	Macey, S., Wardle, G., The Fundamentals of Car Design and Packaging, Design Studio Press, 2009						
Supplementary Textbooks	Hoadley, F.E., Automobile Design Techniques & Design Modeling: The Men, the Methods & the Materials, T a H Productions, 1999						
Credit	3 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Selective						
Instruction Language	Turkish						
Course Objectives	To teach industrial design engineering students general automotive design process and help the aspiring students grasp fundamentals of good design						
Course Learning Outcomes	At the end of this course, students will be equipped with fundamental knowledge and skills and prepared for employment as design engineers in automotive industry which is becoming more competitive and complex on a global scale						
Instruction Methods	Face to face						

	1. Week	Introduction – History of v	ehicle archited	cture in design
	2.	Design process Overview		
	Week 3.	Functional Objectives, sys	tems and mark	et segments
	Week	Tunctional Objectives, sys	tems and mark	et segments
	4. Week	Size and Proportion		
	5. Week	Interiors and Cargo		
	6. Week	Powertrains  Wheels and tires		
	7. Week			
Weekly Schedule	8. Week	Suspension and Chassis		
	9. Week	Bodies		
	10. Week	Aerodynamics		
	11. Week	Safety and crash regulation	ns	
	12. Week	Mobility		
	13. Week	Design Excercises		
	14. Week	Case study		
	WEEK			
	Weekly th	neoretical course hours: 2		
Teaching and Learning Methods		atorial hours: 0		
	Reading A	Activities: 10		
(These are examples. Please fill which activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing
	materials:	24		
	Report pr	eparing: 8		
		a Presentation: 0		
	Presentati			
	_	on of Midterm and Midterm		
	Final Exa	m and Preparation for Final		
			Numbers	Total Weightin g (%)
	Midterm		1	40
	Assignm Applicat		2	20
Assessment Criteria	Projects		_	-
1 199099 HICH CITUITA	Practice Quiz			
		of In-term Studies		60
		nge of Final Exam to Total 6)		40

Attendance		

		Activity	Total Number of Weeks	(w	ura vee	kly			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours Weekl	y Tutorial Hours							
		ng Tasks	2			3			6
	Studie		3			4			12
		al Design and	2			6			12
		mentation	2						
Workload		Preparing ing a Presentation	2			4			8
		tations							
		m Exam and							
	Preper	ation for	1			5			5
		m Exam Exam and							_
	Preper	ation for Final Exam	1			5			5
		( should phasized)							
		Workload							76
	Total V	Workload / 25							76/25
	Course	e Credit (ECTS)							3
	No	Program Outcon	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex e problems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining perta				x		
	4	Ability to design a consystem, process, developroduct under realist constraints and conditions such a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;					x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		х		
7	Ability to work efficiently in multi-disciplinary teams.		х		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr

	Course Description Form
Course Code and Name	ETM 341 MECHANISMS
Course Semester	5
Catalog Content	All machine parts work with different motion. These all types of motin types is important for machine design. And These machine parts have different jobs in the machine. For this aim machine parts and motions and static and dynamic engineering approach is very important.
Textbook	Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley, Mekanizma Tekniği Eres Söylemez Kirschenbaum, M., G., Mechanisms, 2008.
	Rider, M. J., Design and analysis of mechanisms: a
Supplementary Textbooks	planar approach, 2015.
Credit	2 Credit / 3 AKTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn about machine and machine parts is very impartant. Every each parts jobs have been determined very intelligent. Basic of the mechanicsm knowledge defines the defining the mechanisms, analysis of the mechanisms and syntehesis of the mechanisms.
Course Learning Outcomes	Know the machine parts and motions     Chrow the engineering design processes     To make a design and perform the engineering design pholosophy     Know the design procedures
Instruction Methods	Face to face Practical training

	1. Week	General Concepts						
	2. Week	General Concept and basic i	nechanisms					
	3. Week	Definition of Degree of Free	edom					
	4. Week	e e e e e e e e e e e e e e e e e e e						
	5. Week	Classification of mechanism	S					
	6. Week	Kinematic analysis, motion	anlysis, velo	city anaylsis				
Weekly Schedule	7. Week	Kinematic analysis, motion (3 bar linkage)	anlysis, velo	city anaylsis				
	8. Week	Kinematic analysis, motion (4 bar linkage)	anlysis, velo	city anaylsis				
	9. Week	Grashoff Rules						
	10. Week	Crank – slider mechanism B	iyel curve					
	11. Week	4 bar linkage mechanism Bi	yel curve					
	12. Week	Syntesis of mechanisms (3 bar linkage)						
	13. Week	13. Syntesis of mechanisms (4 bar linkage)						
	14. Week	General Summary						
		neoretical course hours: 2						
Teaching and Learning Methods		ntorial hours: 0						
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 2						
	Internet be materials:	rowsing, library work Designi 3	ng and imple	ementing				
	Report pr	eparing: 1						
	Preparing	a Presentation: 1						
	Presentati	ons: 1						
	Preparatio	on of Midterm and Midterm E	xam: 10					
	Final Exa	m and Preparation for Final E						
			Numbers	Total Weightin g (%)				
	Midterm		X	40				
	Assignm Applicat		X X	10				
	Projects		Α.					
Assessment Criteria	Practice							
		of In-term Studies		60				
	(%) Percenta	ge of Final Exam to Total	X	40				
	_ 5.00114	5 2 to 10th						

Sacra (9/)	İ	İ	İ
Score (%) Attendance			
7 ttondance			
I and the second			1

		Activity	Total Number of Weeks	(w	ura vee our	kly			Total Period Work Load
	Weekl Hours	y Theoretical Course	14			2			28
		y Tutorial Hours							
	Readir	ng Tasks	4			3			12
	Studie	S	4			3			12
		al Design and	3			5			15
		nentation Preparing				_			
Workload		ing a Presentation							
		tations							
		m Exam and							
		ation for	1			4			4
		m Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		(should phasized)							
		Workload	-			_			75
		Workload / 25						75/25	
		e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and					x	
	4	Ability to design a consystem, process, developer to the product under realist constraints and conditions are desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in the it the it to apply ods for this elect and es and nalysis and problems eations; ation				x		

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		х		
7	Ability to work efficiently in multi-disciplinary teams.		Х		
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		>	(	
12	Knowledge on practices in business, such as project management, risk management and change management.		>	ί.	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		2	1	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact	Doç. Dr. Murat Tolga ÖZKAN
Informations	tozkan@gazi.edu.tr

	Course Description Form
Course Code and Name	ETM 342 – Ecological Design
Course Semester	6
Catalog Content	An Introduction to ecological design, Product system life cycle, Ecodesign strategy wheel, Ecodesign ideologies, Emerging strategies, Design for recycling, Ecodesign process tree, Measuring environmental performance, Science in Life Cycle Assessment (LCA), Understanding toxicity, Design ethics – Biotic and social imperatives, Ecology for designers, Evolution of the biosphere, Achieving social equity
Textbook	White, P., Pierre, L., Belletire and S. Okala Practitioner: Integrating Ecological Design, Okala Team, 2013  Van der Ryn, S., Cowan, S., Ecological Design, Tenth Anniversary Edition, Island Press, 2007
Supplementary Textbooks	Melnick, R. (2001). Ecology and design: frameworks for learning. Island Press.
Credit	3 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To provide practical information and methods for designing products and systems with low impact to ecological health and human health.
Course Learning Outcomes	At the end of this course students will learn systematic ecodesign tools such as Ecodesign Strategy Wheel and life cycle assessment (LCA) and be able to see the wider view and manage a depth of information to steer their design work towards more ecologically responsible designs and ways of living. Eventually students can take holistic system view of products with complete range of environmental impacts over the full cycle, from material extraction to end of life.
Instruction Methods	Face to face

	1. Week		tion to ecological design				
	2. Week	Product syst	em life cycle				
	3. Week	Ecodesign st	trategy wheel				
	4. Week	Ecodesign io	deologies				
	5. Week	Emerging str	rategies				
	6. Week	Design for re	ecycling				
	7. Week	Ecological d	esign process tree				
Weekly Schedule	8. Week	Measuring e	nvironmental performance				
	9. Week	Science in L	CA				
	10. Week	Understandi	ng toxicity				
	11. Week	Design ethic	s – Biotic and social imperatives				
	12. Week	Ecology for	designers				
	13. Week	Evolution of	the biosphere				
	14. Week	Achieving social equity					
	WEEK						
	Weekly theo	oretical course	hours: 2				
Teaching and Learning	Weekly tuto	rial hours: 0					
Methods	Reading Act	civities: 2					
	Internet brov	wsing, library	work Designing and implementing n	naterials: 0			
	Report prepa	aring: 1					
	Preparing a	Presentation:	1				
	Presentation	s: 1					
	Preparation	of Midterm an	nd Midterm Exam: 10				
	Final Exam	and Preparation	on for Final Exam: 10				
			Numbers	Total Weighting (%)			
	Midterm E	xams	1	30			
	Assignmen	ıt	1	10			
	Application Projects	n	1	20			
Assessment Criteria	Projects		1	Δ0			
	Quiz						
	Percent of Studies (%			60			
	Percentage Exam to T	of Final		40			
	I						

(%)	
Attendance	

		Activity	Total Number of Weeks	(w	ura vee our	kly			Total Period Work Load
	Weekl Hours	y Theoretical Course	14	2			28		
		y Tutorial Hours							
	Readir	ng Tasks	4			2			8
	Studie	S	3			5			15
		al Design and	2			5			10
	_	nentation t Preparing	1			7			7
Workload		ing a Presentation	1			/			/
		tations							
		m Exam and							
	Preper	1			3			3	
		rm Exam Exam and							
		ation for Final Exam	1			4			4
	Other	( should							
		ohasized) Workload							75
		Workload / 25	-			_			75/25
		e Credit (ECTS)							3
	Course	Program Outcom	305	<u> </u>		Ι	Т		
	No	1 Togram Outcom	108	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem	pertaining oline; ical and in these olve s.			X			
	Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose.					X			
	3	Ability to design a consystem, process, develocet under realist constraints and conditions such a way as to meed desired result; ability modern design methologies.	ice or ic ic itions, in et the v to apply				x		
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	es and nalysis and problems cations; ation		x				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Veysel ÖZDEMİR
Thror mations	vozdemir@gazi.edu.tr

	Course Description Form
<b>Course Code and Name</b>	ETM 343 – AUTOMATIC CONTROL
Course Semester	5
Catalog Content	Giriş, Temel kavramlar, açık ve kapalı kontrol çevrimleri, Kazanç, taransfer fonksiyonu, Kontrol çevrimini inceleme ve tasarlama, Laplans dönüşümü, Trasnfer fonksiyonu ve karakteristik fonksiyon, Uygulamalar, Deneysel çalışmalar, Sistem dinamiği, Elektriksel ve mekanik sistem elemanları, Transfer fonksiyonu, blok diyagramı ve işaret akış diyagramı, Denetleyici tipleri, Kapalı çevrim kontrolü.
Textbook	<ol> <li>Özdağ, N., Dinibütün, A.T., Kuzucu, A., Otomatik Kontrol Temelleri, Birsen Yayı., İstanbul, 1998.</li> <li>Kuo, B.J., Otomatik Kontrol Sistemleri, Literatür Yay., İstanbul, 1999.</li> </ol>
Supplementary Textbooks	Raven, F. H., Automatic Control Engineering, 1968.
Credit	3 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
<b>Instruction Language</b>	Turkish
Course Objectives	Automatic control learn subjects and methods, gain the ability to practice. Give circuit and system concept. To teach the models of physical systems. To find the transfer functions of physical systems. To teach the concept of stability and its criteria. To give methods such as block diagram, signal flow diagram, Bode diagram, Routh-Hurwitz criterion, geometric ground curve of roots. Obtain the mathematical model of a given linear system and to teach the system behavior and stability by using this model. To teach how to do system design.
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of automotic control.</li> <li>They can use the knowledge of this course while solving design problems.</li> </ol>
Instruction Methods	Face to face

	1 Wash	T.,4.,., d.,.,4.,.,							
	1. Week	Introduction							
	2. Week		ots, open and closed control circuits						
	3. Week	Gain, transfe	er funtion						
	4. Week	Examination	and design of control circuits						
	5. Week	The Laplace							
	6. Week	Transform fu	unction and chacteristic function						
	7. Week	Applications	:						
Weekly Schedule	8. Week	Experimenta	l works						
	9. Week	System dyna	mics						
	10. Week	Elemts of electrical and mechanical systems							
	11. Week	Transform fu	unction, block diagram and sign diagra	am of a flowchart					
	12. Week	Applications							
	13. Week	Types of controllers							
	14. Week	Experimenta	l works, control of the closed circuits						
	Weekly theo	oretical course	hours: 2						
Teaching and Learning	Weekly tuto	rial hours: 0							
Methods	Reading Act	tivities: 2							
	Internet brov	wsing, library	work Designing and implementing ma	terials: 0					
	Report prepa	aring: 1							
	Preparing a	Presentation: 1	I						
	Presentation	s: 1							
	Preparation	of Midterm an	d Midterm Exam: 10						
	Final Exam	and Preparatio	on for Final Exam: 10						
			Numbers	Total Weighting (%)					
	Mile		1	20					
	Midterm E Assignmen		1	30					
	Application								
Assessment Criteria	Projects		1	30					
Assessment Criteria	Practice								
	Quiz Percent of	In-term		60					
	Studies (%								
	Percentage	tage of Final 40							
	Exam to To (%)	otal Score							
	Attendance	e							

		Activity	Total Number of Weeks	(w	ura zee our	kl	on y		Total Period Work Load
		y Theoretical Course	14			2			28
	Hours	y Tutorial Hours	11						20
		ng Tasks							
	Studie		3			5			15
		al Design and	2						
	Impler				5			10	
Workload		Preparing	2			7			14
World		ing a Presentation							
		tations rm Exam and							
		ation for	1			4			4
		m Exam Exam and							
		exam and ation for Final Exam	1			4			4
	Other	( should							
		ohasized) Workload							75
		Workload / 25	-			-			75/25
		e Credit (ECTS)							3
		Program Outcom	nes						3
	No	1 Togram Outcom	ics	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and seengineering problem	e and pertaining line; ical and in these plye			X			
	2	Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	ngineering select and s and			X			
	3	Ability to design a consystem, process, developroduct under realist constraints and conditions as to mee desired result; ability modern design methological modern design methological modern design methological modern design methological modern design methological modern design methological	ice or ic ic itions, in ot the or to apply				x		
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	es and nalysis and problems rations;		X				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

	Course Description Form
Course Code and Name	ETM 344 – ENERGY SYSTEMS DESIGN
Course Semester	6
Catalog Content	Introduction, Piping systems, Applications, Heat exchangers I and II, System simulation, Analysis and modeling of thermal and fluid systems, Evaluation of system performance, Consideration of system economics, System design optimization, A general design example.
Textbook	<ol> <li>Hodge, B.K. and Taylor, R.P., Analysis and Design of Energy Systems, Prentice Hall Pub., 1999.</li> <li>Tostevin, G.M., Energy Systems Design and Operations: A Unified Method, Prentice Hall Pub., 2011.</li> </ol>
Supplementary Textbooks	Research in Engineering Design     Int. Journal of Design Engineering
Credit	3 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn energy systems design issues, to gain the ability to apply. It is a course that plans, projects, implements, and develops strategies for the use of all kinds of energy in an adequate, high-quality, continuous, low-cost and environmentally compatible manner, and offering and using them economically.
Course Learning Outcomes	Students who attend this course learn basis of enegy systems design.     They can make better enegy systems desigs based on knowledge of this course.
Instruction Methods	Face to face

2. Week   Piping systems   3. Week   Applications   4. Week   Heat exchangers   1   5. Week   Applications   6. Week   Heat exchangers   II   7. Week   Applications   8. Week   Prime movers   9. Week   System simulation   10. Week   11. Evaluation of system performance   12. Week   12. Consideration of system performance   12. Week   13. System design optimization   14. Week   14. Week   14. Week   14. Week   15. System design example   16. Week   16. System design optimization   16. System design optimization   16. System design example   16. System design example   17. System design example   18. System des		4 337 1	T . 1							
3. Week   Applications   4. Week   Heat exchangers     5. Week   Applications   6. Week   Applications   7. Week   Applications   8. Week   Applications   8. Week   Prime movers   9. Week   System simulation   10.		1. Week	Introduction							
4. Week 4. Week 4. Applications 6. Week 6. Week 4. Applications 8. Week 4. Applications 8. Week 5. System simulation 10. Analysis and modeling of thermal and fluid systems Week 11. Evaluation of system performance 12. Consideration of system economics Week 13. System design optimization Week 14. A general design example Weekl totorial hours: 0 Reading Activities: 2 Internet browsing, library work Designing and implementing materials: 0 Report preparing: 1 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 10  Midterm Exams 1 30 Assignment Application Projects 1 30 Percentage of Final Exam to Total Score (%) Percentage of Final Exam to Total Score (%)		2. Week	Piping syste	ems						
S. Week   Applications   G. Week   Heat exchangers II		3. Week	Application	S						
Comparison of Midterm Exams   1		4. Week	Heat exchar	ngers I						
T. Week   Applications   S. Week   Prime movers		5. Week	Application	S						
Seekly Schedule   System simulation   10.   Analysis and modeling of thermal and fluid systems   11.   Evaluation of system performance   12.   Consideration of system economies   13.   System design optimization   14.   A general design example   Weekly theoretical course hours: 2   Weekly tutorial hours: 0   Reading Activities: 2   Internet browsing, library work Designing and implementing materials: 0   Report preparing: 1   Preparing a Presentation: 1   Presentations: 1   Preparation of Midterm and Midterm Exam: 10   Final Exam and Preparation for Final Exam: 10   Final Exam and Preparation for Final Exam: 10   Final Exam		6. Week								
9, Week   System simulation		7. Week								
10.   Analysis and modeling of thermal and fluid systems	Weekly Schedule	8. Week	Prime movers							
Week   Evaluation of system performance   Week   11.   Week   12.   Consideration of system economics   Week   13.   System design optimization   Week   14.   A general design example   Weekly theoretical course hours: 2   Weekly tutorial hours: 0   Reading Activities: 2   Internet browsing, library work Designing and implementing materials: 0   Report preparing: 1   Preparing a Presentation: 1   Presentations: 1   Preparation of Midterm and Midterm Exam: 10   Final Exam and Preparation for Final Exam: 10     Numbers   Total Weighting (%)     Assignment   Application   Projects   1   30   Assignment   Application   Projects   1   30   Practice   Quiz   Percent of In-term   Studies (%)   Percentage of Final Exam to Total Score (%)   Percentage of		9. Week	System sim	ılation						
Week   12.   Consideration of system economics   Week   13.   System design optimization   Week   14.   Week   A general design example			Analysis and	d modeling of thermal and flu	iid systems					
Week   13.   System design optimization   Week   14.   Week   14.   Week   14.   Week   I4.   A general design example   Weekly theoretical course hours: 2   Weekly tutorial hours: 0   Reading Activities: 2   Internet browsing, library work Designing and implementing materials: 0   Report preparing: 1   Preparing a Presentation: 1   Preparation of Midtern and Midtern Exam: 10   Preparation of Midtern and Preparation for Final Exam: 10   Sinal Exam and Preparation for Final Exam: 10   Mumbers   Total Weighting (%)   Midtern Exams   1   30   Assignment   Application   Projects   1   30   Practice   Quiz   Precent of In-term   Studies (%)   Percentage of Final Exam to Total Score (%)   Percentage of Final Exam to Total Score   40   Precentage of Final Exam to Total Score   Pre			Evaluation	of system performance						
Week   14.   A general design example			Consideration	on of system economics						
14.   Week    A general design example			System desi	gn optimization						
Weekly tutorial hours: 0 Reading Activities: 2 Internet browsing, library work Designing and implementing materials: 0 Report preparing: 1 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 10    Numbers		14.	A general design example							
Reading Activities: 2 Internet browsing, library work Designing and implementing materials: 0 Report preparing: 1 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 10    Numbers   Total Weighting (%)		Weekly theo	oretical course	e hours: 2						
Reading Activities: 2  Internet browsing, library work Designing and implementing materials: 0  Report preparing: 1  Preparing a Presentation: 1  Presentations: 1  Preparation of Midterm and Midterm Exam: 10  Final Exam and Preparation for Final Exam: 10    Numbers   Total Weighting (%)	Teaching and Learning	Weekly tuto	orial hours: 0							
Report preparing: 1	Wiethods	Reading Ac	tivities: 2							
Preparing a Presentation: 1		Internet bro	wsing, library	work Designing and implem	enting materials: 0					
Presentations: 1		Report prep	aring: 1							
Preparation of Midterm and Midterm Exam: 10		Preparing a	Presentation:	1						
Numbers   Total Weighting (%)		Presentation	ns: 1							
Numbers   Total Weighting (%)		Preparation	of Midterm a	nd Midterm Exam: 10						
Midterm Exams 1 30  Assignment Application Projects 1 30  Practice Quiz Percent of In-term Studies (%) Percentage of Final Exam to Total Score (%)		Final Exam	and Preparati	on for Final Exam: 10						
Assessment Criteria  Assessment Criteria  Projects 1 30  Practice Quiz  Percent of In-term Studies (%)  Percentage of Final Exam to Total Score (%)				Numbers	Total Weighting (%)					
Assessment Criteria  Projects 1 30  Practice Quiz  Percent of In-term Studies (%)  Percentage of Final Exam to Total Score (%)				1	30					
Projects   1   30     Practice   Quiz     Percent of In-term   60     Studies (%)     Percentage of Final     Exam to Total Score (%)										
Practice   Quiz   Percent of In-term   60			<sup>711</sup>	1	30					
Percent of In-term Studies (%)  Percentage of Final Exam to Total Score (%)	Assessment Criteria	Practice								
Studies (%)  Percentage of Final Exam to Total Score (%)		_ `	`T4.		(0)					
Percentage of Final Exam to Total Score (%)					60					
		Percentage Exam to T	e of Final		40					
Attendance		Attendanc	e							

		Activity	Total Number of Weeks	(w	ura /ee	kl	on y		Total Period Work Load
		y Theoretical Course	14			2	)		28
	Hours	y Tutorial Hours					-		20
		ng Tasks	2			2	<b>)</b>		4
	Studie		3			4			12
		al Design and	2			5			10
		mentation							
Workload		t Preparing ring a Presentation	2			7			14
		tations							
		rm Exam and							
	Preper	ration for	1			3	3		3
		rm Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		( should phasized)							
		Workload	-			_			75
	Total '	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	3 4	. 5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  primulate, ingineering select and s and			x			
	4	Ability to design a consystem, process, deviproduct under realist constraints and conditions are used as a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;		x		x		

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

Course Description Form									
<b>Course Code and Name</b>	ETM 345 – MODELMAKING AND PROTOTYPING-II								
Course Semester	5								
Catalog Content	Introduction, Description of advanced modelmaking and giving some examples, Prototyping interactive electronic products, Advanced modelmaking: Principles and choices, health and safety, space and setup, workflow, tools, Adhesives and fillers, Papers and cartons, foamcore, polystyrene foam, Thermoplastic sheet and extruded shapes, polyurethane modelling board, Wood, Modelling clay, casting, Painting and 3D printing, Graphics: Labels and decals, softgoods: Sewn textile products								
Textbook	<ol> <li>Hallgrimsson, B., Prototyping and Modelmaking for Product Design, Laurence King Pub, Int. Ed., 2012.</li> <li>2. Direct-Write Technologies for Rapid Prototyping Applications: Sensors, Electronics, and Integrated Power Sources</li> </ol>								
Supplementary Textbooks	Journal of Engineering Design     Int. Journal of Design Engineering								
Credit	3 ECTS								
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements								
<b>Type of the Course</b>	Elective								
<b>Instruction Language</b>	Turkish								
Course Objectives	To learn advanced models and prototyping methods, to gain the ability to apply. To comprehend the design and production methods of different model patterns. Learning and application of additive manufacturing methods								
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of modelmaking and prototyping.</li> <li>They can develope advanced level models and prototypes.</li> </ol>								
Instruction Methods	Face to face								

	1. Week	Introduction								
	2. Week		of advanced modelmaking and giving	r soma avamnlas						
	2. Week	Description	or advanced modernaking and giving	g some examples						
	3. Week	How prototy	pes are used							
	4. Week	Prototyping	interactive electronic products							
	5. Week	Advanced m	odelmaking: Principles and choices,	health and safety						
	6. Week	Week Advanced modelmaking: Space and setup, workflow								
	7. Week	Tools used for	or modelmaking							
Weekly Schedule	8. Week	Adhesives and fillers								
	9. Week	Papers and c	artons, foamcore, polystyrene foam							
	10. Week	Thermoplast	ic sheet and extruded shapes, polyuro	ethane modelling board						
	11. Week	Wood								
	12. Week	Modelling cl	ay, casting							
	13. Week	Painting and	3D printing							
	14. Week	Graphics: La	bels and decals, softgoods: Sewn tex	tile products						
	Weekly theo	oretical course	hours: 2							
Teaching and Learning	Weekly tuto	ekly tutorial hours: 0								
Methods										
	Reading Act	tivities: 2								
	Internet brov	wsing, library	work Designing and implementing m	aterials: 0						
	Report prep	aring: 1								
	Preparing a	Presentation: 1	[							
	Presentation									
	Preparation	of Midterm an	d Midterm Exam: 10							
	Final Exam	and Preparatio	on for Final Exam: 10							
			Numbers	Total Weighting (%)						
	Midterm E	xams	1	30						
	Assignmen									
	Applicatio Projects	1	30							
Assessment Criteria	Practice Quiz									
	Percent of			60						
	Studies (% Percentage	of Final		40						
	Exam to T	otal Score								

(%)	
Attendance	

		Activity	Total Number of Weeks	(w	ura /ee our	kl			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours	y Tutorial Hours	17						20
		ng Tasks							
	Studie		2	7			,		14
		al Design and		8					
		nentation	2						16
Workload		Preparing	2			5			10
W of Mynu		ing a Presentation							
		tations rm Exam and							
		ation for	1			3			3
		m Exam Exam and							
		exam and ation for Final Exam	1			4			4
	Other	( should							
		ohasized) Workload							75
		Workload Workload / 25	-			-			75/25
		e Credit (ECTS)							3
		Program Outcom	nes				T		3
	No	1 Togram Outcom	ics	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sc engineering problem	e and pertaining lline; ical and in these olve			X			
		Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	ngineering select and s and			X			
	3	Ability to design a consystem, process, developer to under realist constraints and conditions a way as to mee desired result; ability modern design method purpose.	ice or ic itions, in of the v to apply				x		
	4	Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applica ability to use informate technologies effective	es and nalysis and problems cations;		X				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

Course Description Form									
Course Code and Name	ETM 346 – DESIGN FOR REVERSE EGINEERING								
Course Semester	6								
Catalog Content	Introduction to Reverse Engineering, Methodologies and Techniques for Reverse Engineering—The Potential for Automation with 3-D Laser Scanners, Reverse Engineering—Hardware and Software, Selecting a Reverse Engineering System, Design for Reverse Engineering, Applications, Introduction to Rapid Prototyping, Relationship Between Reverse Engineering and Rapid Prototyping, Reverse Engineering in the Automotive Industry, Reverse Engineering in the Aerospace Industry, Reverse Engineering in the Medical Device Industry, Legal Aspects of Reverse Engineering, Barriers to Adopting Reverse Engineering, A general design example.								
Textbook	<ol> <li>Raja, V. and Fernandes, K.J., Reverse Engineering - An Industrial Perspective, Springer Pub., 2008.</li> <li>Otlo, K. and Wood, K., Product Design Techniques in Reverse Engineering and New Product Development, Prentics Hall P., 2000.</li> </ol>								
Supplementary Textbooks	Research in Engineering Design     Int. Journal of Computer-Aided Engineering								
Credit	3 AKTS								
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements								
Type of the Course	Selective								
Instruction Language	Turkish								
Course Objectives	To learn the design steps of Reverse Engineering, to comprehend the usage area and objectives, to use 3D scanner and to gain the ability to apply on the case study								
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of design for reverse egineering.</li> <li>They can make better, cheaper and more efficient desigs by using knowledge gained in this course.</li> </ol>								
Instruction Methods	Face to face								

	1. Week	Introduction to Reverse En	gineering						
	2.	Methodologies and Techni							
	Week 3.	Potential for Automation w Reverse Engineering-Hard							
	Week								
	4. Week	Selecting a Reverse Engine	eering System						
	5. Week	Design for Reverse Engineering							
	6. Week	Applications							
	7. Week	Introduction to Rapid Proto	otyping						
Weekly Schedule	8. Week	Relationship Between Revo	erse Engineeri	ng and RP					
	9. Week	Reverse Engineering in the	Automotive I	ndustry					
	10. Week	Reverse Engineering in the	Aerospace In	dustry					
	11. Week	Reverse Engineering in the	Medical Dev	ice Industry					
	12. Week	Legal Aspects of Reverse Engineering							
	13. Week	Barriers to Adopting Reverse Engineering							
	14. Week	A general design example							
	Week								
		neoretical course hours: 2							
Teaching and Learning Methods		ntorial hours: 0 Activities: 10							
(These are examples. Please fill which		rowsing, library work Desigr	ning and imple	ementing					
activities you use in the course)	materials:		mig und impre	anoming .					
		eparing: 10							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparation	on of Midterm and Midterm	Exam: 3						
	Final Exa	m and Preparation for Final 1	Exam: 4						
			Numbers	Total Weightin g (%)					
	Midterm		1	40					
		Assignment 1 Application							
Assessment Cuitain	Projects		1	10					
Assessment Criteria	Practice								
		of In-term Studies		60					
	(%) Percenta	nge of Final Exam to Total		40					
	Score (%)								

Attendance		

		Activity	Total Number of Weeks	(w	ura ee	kly			Total Period Work Load
	Weekl	y Theoretical Course	14			2			28
	Hours	y Tutorial Hours	14	2					20
	Studie	ng Tasks	4	5			20		
		al Design and	4	5					20
		nentation	4			5			20
***	Report	Preparing							
Workload	Prepar	ing a Presentation							
		tations							
		m Exam and ation for	1			3			2
		m Exam	1			3			3
		Exam and	1			4			4
		ation for Final Exam ( should							<u> </u>
		phasized)							
	Total V	Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem  Ability to identify, for and solve complex engroblems; ability to sapply proper analysis	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and				x		
	4	modeling methods for purpose.  Ability to design a consystem, process, developerate and conditions and conditions are also to such a way as to mee desired result; ability modern design methon purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	omplex ice or ic itions, in et the v to apply ods for this elect and es and nalysis and problems eations; ation					x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		Х		
6	Ability to work efficiently in intra-disciplinary teams.		х		
7	Ability to work efficiently in multi-disciplinary teams.		х		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact	Doç. Dr. Hüseyin Kürşad SEZER
Informations	kursadsezer@gazi.edu.tr

	Course Description Form
Course Code and Name	ETM 347 - Plastics Materials and Technology
Course Semester	5
Catalog Content	Introduction. Polymeric Materials: Molecular Structure and Blends. Description of principal types of plastics. General characteristics of plastics: Strength and stiffness, toughness, fatigue, hardness, effect of temperature, flammability, chemical attack and electrical properties. Reinforced plastics and types of reinforcement. Designing with plastics, design data for plastics. Design with Reinforced Plastics. Injection process. Extrusion, compression and transfer molding, thermoforming. Rolling. Casting. Foams. Joining methods. Design examples.
Textbook	-Strong, A. B., Plastics: Materials and Processing, Englewood Cliffs: New Jersey, Prentice-Hall, Inc., 2nd Ed., 2000Harper, C.A. and Petrie, E.M. Plastics Materials and Processes: A Concise Encyclopedia, John Wiley & Sons Pub. USA, 2003.
Supplementary Textbooks	Callister, W. D., & Rethwisch, D. G. (2007). Materials science and engineering: an introduction (Vol. 7, pp. 665-715). New York: John wiley & sons.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Teaching basis of plastics materials and technology, gaining capabilities for its applications.
Course Learning Outcomes	<ul> <li>Students who attend this course learn basisi of plastics materials and technology</li> <li>They can apply rules and methods of this course while making desigs, so they can make designs based on scientific bases and methodical rules.</li> </ul>
Instruction Methods	Expression

	1. Week	Introduction						
	2. Week	Polymeric Materials: Mole	cular Structure	e and Blends.				
	3. Week	Description of principal typ	es of plastics.					
	4. Week	General characteristics of p toughness, fatigue, hardnes flammability, chemical atta	ss, effect of te	mperature,				
	5. Week	Reinforced plastics and typ	es of reinforce	ement.				
	6. Week	Designing with plastics, de	sign data for p	olastics.				
Weekly Schedule	7. Week	Applications						
	8. Week	Design with Reinforced Pla	istics.					
	9. Week	Injection process.						
	10. Week	Extrusion, compression and	l transfer mole	ding, thermofo	orming.			
	11. Week	Applications						
	12. Week	Rolling. Casting. Foams.						
	13. Week	Joining methods.						
	14. Week	Design examples.						
	15. Week							
	Weekly th	neoretical course hours: 2						
Teaching and Learning Methods	Weekly to	utorial hours: 2						
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 5						
	Internet b materials:	rowsing, library work Design 12	ing and imple	ementing				
	Report pr	eparing: 0						
	Preparing	a Presentation: 0						
	Presentati	ions: 0						
	Preparation	on of Midterm and Midterm I	Exam: 4					
	Final Exa	m and Preparation for Final I	Exam: 4 Numbers	Total				
			numbers	Weightin g (%)				
	Midtern Assignn	n Exams	1	40 20				
	Assignin		1	20				
Assessment Criteria	Projects							
ASSESSMENT CHILLIA	Practice							
	Quiz Percent	of In-term Studies						
	(%)			60				

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w	ura vee our	kly			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours Weekly Tutorial Hours								
		ng Tasks	5			1			5
	Studie		6			2			12
		al Design and	4			6			24
		mentation	<u> </u>						
Workload		Preparing ing a Presentation							
		tations							
		m Exam and							
	Preper	ation for	1			2			2
		m Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		(should			_	_			
		ohasized) Workload	_			_			75
		Workload / 25							75/25
		e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem  Ability to identify, for and solve complex engroblems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and				x		
	4	Ability to design a consystem, process, deviproduct under realist constraints and conditions are also as which a way as to mee desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;			x	x		

	5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.			х	
	6	Ability to work efficiently in intra-disciplinary teams.		х		
	7	Ability to work efficiently in multi-disciplinary teams.		Х		
	8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	Х			
	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.	х			
	10	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		
•	11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.	Х			
•	12	Knowledge on practices in business, such as project management, risk management and change management.			X	
•	13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		х		
•	14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	X			

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr
	would have been a second and a second a second and a second and a second and a second and a second and a second and a second and a second and a second and a second a second and a second and a second and a second and a second and a second and a second and a second and a second and a second and a second and a second and a second and a second and a second a

	Course Description Form
Course Code and Name	ETM 420 – ROBOTICS
Course Semester	7-8
Catalog Content	Introduction, Basic concepts in robotics, Classification and structure of robotic systems, Drives and control systems, Applications, Kinematic analysis and coordinate transformation, Trajectory interpolators, Applications of robots, Programming, Sensor and intelligent robots, Installing a robot.
Textbook	<ol> <li>Koren, Y., Robotics for Engineers, McGraw-Hill Pub., Int. Ed., 1985.</li> <li>Niku, S.B., Introduction to Robotics: Analysis, Control, Applications, John Wiley &amp; Sons Pub, USA, 2010.</li> </ol>
Supplementary Textbooks	3. Craig, J. J. (2009). Introduction to robotics: mechanics and control, 3/E. Pearson Education India.
Credit	3 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Design and development of robot mechanisms, understanding of movement mechanisms and equipment, learning of robotic programming algorithm
Course Learning Outcomes	<ol> <li>Students who attend this course learn basics of industrial robotics.</li> <li>They can make better and more efficiently designs based on this course.</li> </ol>
Instruction Methods	Face to face

	1. Week	Introduction	
	2. Week	Basic concepts in robotics	
	3. Week	Classification and structure of robotic sy	stems
	4. Week	Drives and control systems	
	5. Week	Applications	
	6. Week	Kinematic analysis and coordinate transf	ormation
	7. Week	Applications	
	8. Week	Trajectory interpolators	
Weekly Schedule	O Wash		
	9. Week	Applications of robots	
	10. Week	Programming	
	11. Week	Applications	
	12. Week	Sensor and intelligent robots	
	13. Week	Installing a robot	
	14. Week	Applications	
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
	Weekly theo	retical course hours: 2	
Teaching and Learning Methods	Weekly tuto	ial hours: 0	
	Reading Act	vities: 2	
	Internet brov	rsing, library work Designing and implementing	ng materials: 0
	Report prepare	ring: 1	
	Preparing a	Presentation: 1	
	Presentation	: 1	
	Preparation	of Midterm and Midterm Exam: 10	
	Final Exam	nd Preparation for Final Exam: 10	
		Numbers	Total Weighting (%)
	Midterm E		30
	Assignmen		
	Applicatio		20
Assessment Criteria	Projects Practice	1	30
	Quiz		
	Percent of	n-term	60
	Studies (%		
	Percentage		40
	Exam to T	tai Score	

(%)	
Attendance	

		Activity	Total Number of Weeks	(w	ura /ee	kl			Total Period Work Load
		y Theoretical Course	14			2	,		28
	Hours	y Tutorial Hours							
		ng Tasks	7			2			14
	Studie		1			5			5
		al Design and	2			5			10
		nentation							10
Workload		Preparing							
vv of kidad		ing a Presentation							
		tations							
		m Exam and ation for	2			3			6
	Midter	m Exam							
		Exam and	3			4			12
		ation for Final Exam ( should							
	be emp	phasized)							
	Total V	Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex e problems; ability to sapply proper analysis.	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and			x			
	4	modeling methods for purpose.  Ability to design a consystem, process, develocated product under realist constraints and conditions such a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	omplex ice or ic itions, in at the to apply ods for this elect and es and nalysis and problems ations;		x		x		

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15	Knowledge about awareness of the legal consequences of engineering solutions.		2	ζ.	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 422 - Quality Control							
Course Semester	7-8							
Catalog Content	This course provides students with basic coverage of topics in quality assurance and management and reliability. Principles of quality control systems, process control concepts, control charts for variables and attributes, process capability analysis, specification and tolerances, acceptance sampling plans, reliability networks, life testing, failure mode and effect analysis, and fault trees are among the topics discussed.							
Textbook	Besterfield D.H. Quality Improvement. Pearson, 2012  Jain, P.L. and JainTata Quality Control and Total Quality Management, McGraw-Hill Pub., 2001							
Supplementary Textbooks	Brechner, E. (2015). Agile project management with Kanban. Pearson Education.							
Credit	3 ECTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Elective							
Instruction Language	Turkish							
Course Objectives	Teaching basis of quality control, gaining capabilities for its applications.							
	<ol> <li>Understand and define concepts in quality and quality management</li> <li>Apply statistical tools in analysis and application of Statistical Process Control</li> <li>Develop control charts for quality improvement</li> <li>Understand sampling process, and design acceptance sampling procedures for quality control</li> <li>Define and provide solutions for simple experimental design problems</li> <li>Understand and define basic concepts in reliability</li> </ol>							
Instruction Methods	Expression							

	1.	Introduction to Quality						
	Week  2. Week	History of Quality Moveme	ent					
	3. Week	The Value of Quality						
	4. Week	Human and Quality						
	5. Week	Product, Process and Quality						
	6. Week	Explaing the Meaning of Q	-					
	7. Week	Prepararing of manufacturi	ng process					
Weekly Schedule	8. Week	Determination of Requiren	nents Process					
	9. Week	Desing Process						
	10. Week	Building of Process						
	11. Week	Investigation of Process						
	12. Week	Quality Management Syste	m					
	13. Week	Quality Management Syste	m					
	14. Week	Establishing the Quality Cu	ılture					
	15.							
	Weekly tl	neoretical course hours: 2						
Teaching and Learning Methods		utorial hours: -						
(These are examples. Please fill which	Reading A	Activities: 6						
activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing				
	Report pr	eparing: 0						
	Preparing	a Presentation: 0						
	Presentati	ions: 0						
	Preparation	on of Midterm and Midterm	Exam: 4					
	Final Exa	m and Preparation for Final l						
			Numbers	Total Weightin g (%)				
	Midtern		1	40				
	Assignn Applica		1	20				
40.5	Projects							
Assessment Criteria	Practice							
	Quiz	of In-term Studies						
	(%)	of in-term studies		60				

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w		ntio kly ')			Total Period Work Load
	Weekl Hours	y Theoretical Course	14	2			28		
		y Tutorial Hours							
	Readir	ng Tasks	3			2			6
	Studie	S	6			3			18
		al Design and	5			3			15
	_	nentation Preparing							
Workload		ing a Presentation							
		tations							
		m Exam and							
		ation for	1			4			4
		m Exam Exam and							
	Preper	ation for Final Exam	1			4			4
		(should phasized)							
		Workload	-			-			75
		Workload / 25							75/25
		e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex exproblems; ability to sapply proper analysis modeling methods for purpose.	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and			х		X	
	4	Ability to design a consystem, process, developer to under realist constraints and conditions are also to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex solution.	ice or ic itions, in et the v to apply ods for this elect and es and nalysis and problems			X	x		
		in engineering applic ability to use informa technologies effectiv	ation						

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		X		
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			
10	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	
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			X	
12	Knowledge on practices in business, such as project management, risk management and change management.		X		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.	x			
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

		Knowledge about awareness of the legal consequences of engineering solutions.			X			
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr							

Course Description Form								
Course Code and Name	ETM 424 - Advanced Material Technologies							
Course Semester	7-8							
Catalog Content	Structural Materials - Metals, Ceramics and Glasses, Boron Technologies, Polymers and Composites, Functionally graded materials, Smart and Functional Materials Technology, Magnetic, electronic and opto-electronic materials, biomaterials, nanomaterials.							
Textbook	<ol> <li>Baykara, T. 'İleri Malzeme Teknolojileri', PPT, MSB-ArGe, Aralık 2009</li> <li>İstanbul Ticaret Odası, "İleri Malzeme Teknolojileri Sektör Raporu", Mert Özcömert, Ekim 2005</li> <li>Eker, A. A., 'İleri Teknoloji Malzemeleri', PPT, YTÜ, 2004,</li> <li>Rahaman M.N., Ceramic Processing and Sintering,2003</li> <li>Saxl, O., Opportunities for Industry in teh Application of Nanotechnology, London Office of S&amp;T, 2000</li> </ol>							
Supplementary Textbooks								
Credit	3 ECTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Elective							
Instruction Language	Turkish							
Course Objectives	To teach structure, properties and manufacturing processes of advanced technology materials and the strong relations of these on the material performance. To impart understanding of the importance of material selection and design using material science principles. To introduce high-tech materials used in defense, aerospace, micro-electronics, communications and medical sectors.							
Course Learning Outcomes	Understanding of advanced technology materials' high performance and superior qualities in terms of mechanical, thermal, electrical, magnetic, optical, chemical and biological etc. functions							
<b>Instruction Methods</b>	Expression							

	1.	Introduction – classification							
	Week 2.	basic qualities, behavior, r. Advanced metallic materia							
	Week	Advanced metanic materia	iis (superanoys	5)					
	3. Week	Advanced engineering cer	amics						
	4. Week								
	5.								
	Week 6.								
	Week	Boron technologies							
	7. Week	Composites (polymer, met glass, aramid, ceramic, box							
Weekly Schedule	8. Week	Midterm exam							
	9. Week	Functionally graded mater	ials						
	10. Week	Superconductors / Semico	nductors						
	11. Week	Magnetic, electronic or op	to-electronic n	naterials					
	12. Week	Biomaterials							
	13. Week	Nanomaterials and applica	ations						
	14. Week	14. The situation in Turkey and the world on advanced materials							
	15.	Applications							
	Week								
	Weekly tl	heoretical course hours: 2							
Teaching and Learning Methods	Weekly to	utorial hours: 2							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 5							
,	Internet b	orowsing, library work Desig : 12	ning and imple	ementing					
	Report pr	reparing: 0							
	Preparing	g a Presentation: 0							
	Presentati	ions: 0							
	Preparation	on of Midterm and Midterm	Exam: 4						
	Final Exa	ım and Preparation for Final	Exam: 4						
			Numbers	Total Weightin					
	Midtern	n Exams	1	<b>g</b> (%) 40					
		Assignment 1 20							
	Application								
Assessment Criteria	Projects Practice								
	Quiz	,							
	Percent	of In-term Studies		60					
	(%)			00					

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w		atio kly ')			Total Period Work Load
	Weekl Hours	y Theoretical Course	14	2			28		
	Weekly Tutorial Hours								
		ng Tasks	5			1			5
	Studie	s	6			2			12
		al Design and nentation	2			4			8
		Preparing	2			3			6
Workload	Prepar	ing a Presentation	2			5			10
	Presen	tations							
		m Exam and	1			2			2
		ation for m Exam							
		Exam and	1			4			4
		ation for Final Exam							
		(should phasized)							
		Workload	_			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)					3		
		Program Outcom	nes	1	2	3	1	5	
	No			1	2	3		3	
	1	Adequate knowledge mathematics, science					X		
		engineering subjects							
		to the relevant discip	line;						
Contribution Level Between Course Learning		ability to use theoret							
Outcomes and Program Outcomes	applied information i areas to model and so								
		engineering problem							
	2	Ability to identify, for	ormulate.		X				
		and solve complex e	ngineering						
		problems; ability to							
		apply proper analysis modeling methods for							
		purpose.	or uns						
	3	Ability to design a co				X			
		system, process, dev product under realist							
		constraints and cond							
		such a way as to mee	et the						
		desired result; ability							
		modern design methor purpose.	ods for this						
		Parposo.				1			
	4	Ability to develop, so					x		
		use modern techniqu							
		tools necessary for a solution of complex							
		in engineering applic							
		ability to use informa	ation						
		technologies effectiv	ely.						

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		X		-
7	Ability to work efficiently in multi-disciplinary teams.	Х			
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	
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			X	
12	Knowledge on practices in business, such as project management, risk management and change management.			x	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		х		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	X			

		Knowledge about awareness of the legal consequences of engineering solutions.				X	
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr						

	Course Description Form									
Course Code and Name	ETM 426 - Advanced Material Technologies									
Course Semester	7-8									
Catalog Content	Structural Materials - Metals, Ceramics and Glasses, Boron Technologies, Polymers and Composites, Functionally graded materials, Smart and Functional Materials Technology, Magnetic, electronic and opto-electronic materials, biomaterials, nanomaterials.									
Textbook	<ul> <li>- Baykara, T. 'İleri Malzeme Teknolojileri', PPT, MSB-ArGe, Aralık 2009</li> <li>- İstanbul Ticaret Odası, "İleri Malzeme Teknolojileri Sektör Raporu", Mert Özcömert, Ekim 2005</li> <li>- Eker, A. A., 'İleri Teknoloji Malzemeleri', PPT, YTÜ, 2004,</li> </ul>									
Supplementary Textbooks	- Rahaman M.N., Ceramic Processing and Sintering,2003 -Saxl, O., Opportunities for Industry in teh Application of Nanotechnology, London Office of S&T, 2000									
Credit	3 ECTS									
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements									
Type of the Course	Elective									
Instruction Language	Turkish									
Course Objectives	To teach structure, properties and manufacturing processes of advanced technology materials and the strong relations of these on the material performance. To impart understanding of the importance of material selection and design using material science principles. To introduce high-tech materials used in defense, aerospace, micro-electronics, communications and medical sectors.									
Course Learning Outcomes	Understanding of advanced technology materials' high performance and superior qualities in terms of mechanical, thermal, electrical, magnetic, optical, chemical and biological etc. functions									
<b>Instruction Methods</b>	Expression									

	1.	Introduction – classification			asic				
	Week	qualities, behavior, morph							
	2. Week	Advanced metallic materia	ais (superalloys	s)					
	3. Week	Advanced engineering cer	amics						
	4. Week	Advanced polymers							
	5.	Advanced glass technolog	ies						
	6.								
	7. Week	Composites (polymer, metal or ceramic matrix - carbon,							
Weekly Schedule	8. Week	Midterm exam							
	9. Week	Functionally graded mater	ials						
	10. Week	Superconductors / Semico	nductors						
	11. Week	Magnetic, electronic or op	to-electronic n	naterials					
	12. Week	Biomaterials							
	13. Week	Nanomaterials and applica	ntions						
	14. Week	14. The situation in Turkey and the world on advanced							
	15. Week	Applications							
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly to	utorial hours: 2							
(These are examples. Please fill which	Reading A	Activities: 5							
activities you use in the course)	Internet b materials:	rowsing, library work Desig	ning and imple	ementing					
	Report pr	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ions: 0							
	Preparation	on of Midterm and Midterm	Exam: 4						
	Final Exa	m and Preparation for Final		· '					
			Numbers	Total Weightin g (%)					
	Midtern	n Exams	1	40					
	Assignn	Assignment 1 20							
		Application							
Assessment Criteria	Projects Practice								
	Quiz Percent	of In-term Studies		60					

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w		atio kly ')			Total Period Work Load	
	Weekl Hours	y Theoretical Course	14			2			28	
		y Tutorial Hours								
		ng Tasks	5			1			5	
	Studie	s	6			2			12	
		al Design and nentation	2			4			8	
		Preparing	2			3			6	
Workload	Prepar	ing a Presentation	2			5			10	
	Presen	tations								
		m Exam and	1			2			2	
		ation for m Exam								
		Exam and	1			4			4	
		ation for Final Exam								
		(should phasized)								
		Workload	_			-			75	
	Total V	Workload / 25							75/25	
	Course	e Credit (ECTS)							3	
		Program Outcom	nes	1	2	3	1	5		
	No			1	2	3		3		
	1	Adequate knowledge					X			
	mathematics, science a engineering subjects p									
		to the relevant discip	line;							
Contribution Level Between Course Learning		ability to use theoret								
Outcomes and Program Outcomes		applied information areas to model and s								
	engineering problems.									
	2	Ability to identify, for	ormulate.		X					
		and solve complex e	ngineering							
		problems; ability to								
		apply proper analysis modeling methods for								
		purpose.	or uns							
	3	Ability to design a co				X				
		system, process, dev product under realist								
		constraints and cond								
		such a way as to mee	et the							
		desired result; ability								
		modern design methor purpose.	ods for this							
		Parposo.				1				
	4	Ability to develop, so					x			
		use modern techniqu								
		tools necessary for a solution of complex								
		in engineering applic								
		ability to use informa	ation							
		technologies effectiv	ely.							

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		X		-
7	Ability to work efficiently in multi-disciplinary teams.	Х			
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	
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			X	
12	Knowledge on practices in business, such as project management, risk management and change management.			x	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		х		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	X			

		Knowledge about awareness of the legal consequences of engineering solutions.				X	
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr						

Course Description Form								
Course Code and Name	ETM 428 – HEAT AND MASS TRANSFER							
Course Semester	7-8							
Catalog Content	Heat transfer types: conduction, convection, radiation, general heat conduction equation, one-dimensional steady-state conduction, conduction of parallel plane cylindrical systems, heat convection, total heat transfer coefficient, temperature loss in the pipes, critical isolation thickness, cooling small body, thermal radiation.							
Textbook	Frank P. Incropera, David P. DeWitt, Isı ve Kütle Geçişinin Temelleri, Literatür Yayıncılık, 2001. Heat and Mass Transfer. A Practical Approach. Yunus A. Çengel. Third Edition Mc-Graw Hill (2007) New York Altınışık, K., 'Uygulamalarla ısı transferi', Nobel Yay., Ank, 2003							
Supplementary Textbooks	Atagündüz, G., 'Isı transferi', Ege Üniversitesi, İzmir, 1983  Bayazıtoğlu, Y., Elements of heat transfer, McGraw Hill, 1988							
Credit	3 AKTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Selective							
Instruction Language	Turkish							
Course Objectives	To introduce the basic principles of heat transfer • To present a wealth of real- world engineering examples to give students a feel for how heat transfer is applied in engineering practice • To develop an intuitive understanding of heat transfer by emphasizing the scientific arguments. • To develop an understanding of the concentration gradient and the physical mechanism of mass transfer, and also mass transfer by diffusion and convection.							
Course Learning Outcomes	Have a firm understanding of heat transfer mechanisms (conduction, convection and radiation), Be able to use distinguish steady and unsteady heat transfer by conduction and the modes of convection, Be able to analyze various kinds of thermal systems, Have an understanding of mass transfer mechanisms (diffusion and convection), Improve skills on how to approach and solve problems in mass and heat transfer related engineering problems, Recognize the need for, and an ability to engage in life-long learning, Be aware of the reasons of the important subjects such as global heating and climate change.							
Instruction Methods	Face to face							

	1.	Introduction and Basic Co	ncepts						
	Week 2.	Heat Conduction Equation							
	Week	Treat Conduction Equation							
	3.								
	Week	4. Transient Heat Conduction							
	Week	Transfellt Heat Collduction	I						
	5.								
	Week								
	6. Week	Fundamentals of Convection	on						
	7.	External Forced Convection	on						
	Week 8.	Internal Forced Convection	n						
Weekly Schedule	Week								
		Natural Convection Boiling and Condensation							
	9.	Boiling and Condensation							
	Week 10.	Heat Exchangers							
	Week								
	11. Week	Fundamentals of Thermal Radiation							
	12.	Radiation Heat Transfer							
	Week								
	13. Week	Mass Transfer							
	14. Week	Mass Transfer-Case study							
	Weeklyd	heoretical course hours: 2							
		utorial hours: 0							
<b>Teaching and Learning Methods</b>		Activities: 0							
(These are examples. Please fill which		browsing, library work Design	ning and imple	ementing					
activities you use in the course)	materials		8 1	8					
	Report pr	reparing: 0							
		g a Presentation: 0							
	Presentat	ions: 0							
	Preparation	on of Midterm and Midterm	Exam: 0						
	Final Exa	nal Exam and Preparation for Final Exam: 0							
			Numbers	Total Weightin					
	g (%)								
	Assignment 1 10								
	Applica		1	10					
Assessment Criteria	Projects		1	10					
	Practice Quiz	;			-				
		of In tarm Studies		60	1				

Percent of In-term Studies

(%)

60

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

		Activity	Total Number of Weeks	(w		tio kly			Total Period Work Load
		y Theoretical Course	14			2			28
	Hours Weekl	y Tutorial Hours				_			
		ng Tasks							
	Studie		3			6			18
		al Design and	4			5			20
		nentation t Preparing	•			_			
Workload		ing a Presentation							
		tations							
		m Exam and							
		ation for m Exam	1			4			4
	Final I	Exam and	1			5			5
		ation for Final Exam	1						3
		( should phasized)							
		Workload	-			-			75
	Total V	Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcon	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem.  Ability to identify, for and solve complex e problems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and				x		
		Ability to design a consystem, process, develocated realist constraints and conditions are desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in et the to apply ods for this elect and es and nalysis and problems eations;					x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		х		
7	Ability to work efficiently in multi-disciplinary teams.		х		
8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	х	-		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	15 Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Veysel ÖZDEMİR vozdemir@gazi.edu.tr

Course Description Form									
Course Code and Name	ETM 430 – DESIGN OF HYDRAULICS AND PNEUMATICS SYSTEMS								
Course Semester	7-8								
Catalog Content	Introduction to hydraulics. Basic principles and standard symbols in hydraulics. Hydraulic pipes and hoses, pumps, motors. Hydraulic cylinders, sealing elements, valves, oil containers. Filters, accumulators. Hydraulic fluids. Electro-hydraulic systems. Faults and determination of them. Hydraulic circuits. Application areas of hydraulic systems. Hydraulic circuit design and applications. Introduction to pneumatics. Physical principles in pneumatics. Collecting, maintenance and distribution of air. Standard symbols. Cylinders, sealing elements, valves and motors. Design and drawing of pneumatic circuits. Hydro-pneumatics. Application areas of pneumatics. Fault finding. Electro-pneumatics. System design and setting the system up using pneumatic components. Introduction to PLC and its programming. Applications of pneumatic circuits.								
Textbook	<ol> <li>Karacan, İ., Hidrolik-Pnomatik Bizim Büro Yay., Ankara, 1989.</li> <li>Karacan, İ., Pnömatik Kontrol Bizim Büro Yay., Ankara, 1991.</li> </ol>								
Supplementary Textbooks									
Credit	3 ECTS								
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements								
Type of the Course	Elective								
Instruction Language	Turkish								
Course Objectives	To have the students learn the elements of hydraulic and pneumatic circuits and enable them to design hydraulic and pneumatic systems								
Course Learning Outcomes	Students attended to this course know the elements of hydraulic and pneumatic circuits and can sellect, calculate and design hydraulic and pneumatic systems.								
Instruction Methods	Face to face								

	1. Week	Introduction to hydraulics. Basic principles in hydraulics									
	2. Week	Standard symbols in hydraulics. Hydraulic pipes and hoses									
	3. Week	Pumps, motors, hydraulic cylinders									
	4. Week	Sealing elements, valves.									
	5. Week	Oil containers. Filters, accumulators. Hydraulic fluids.									
	6. Week	Electro-hydraulic systems. Faults and determination of them in hydraulic systems.									
	7. Week	Hydraulic circuits. Application areas of hydraulic systems in industry.									
W. II. G. I. I.	8. Week	Hydraulic circuit design and applications.									
Weekly Schedule	9. Week	Introduction to pneumatics. Physical principles in pneumatics.									
	10. Week	Collecting, maintenance and distribution of air.									
	11. Week	Standard symbols in pneumatics. Cylinders, sealing elements, valves and motors.									
	12. Week	Design and drawing of pneumatic circuits. Circuit drawing methods.									
	13. Week	Hydro-pneumatics. Application areas of pneumatics. Fault finding.									
	14. Week	Electro-pneumatics. System design and setting the system up using pneumatic components.									
	15. Week	Introduction to PLC and programming of PLC. Applications of pneumatic circuits.									
	Weekly theo	pretical course hours: 2									
0	Weekly tuto:	rial hours: 0									
Methods	Reading Act	tivities: 2									
	Internet brov	wsing, library work Designing and implementing materials: 0									
	Report prepa	aring: 1									
	Preparing a	Presentation: 1									
	Presentation	ss: 1									
	Preparation	of Midterm and Midterm Exam: 10									
	Final Exam and Preparation for Final Exam: 10										
		Numbers Total Weighting (%)									

## Midterm Exams 25 1 Assignment 1 10 Application **Assessment Criteria** 25 Projects 1 Practice Quiz Percent of In-term 60 Studies (%) Percentage of Final Exam to Total Score 40 (%) Attendance

		Activity	Total Number of Weeks	(w	ura /ee	kl	on y		Total Period Work Load
		y Theoretical Course	14	2					28
	Hours	y Tutorial Hours							
		ng Tasks	3			2	2		6
	Studie	-	6			3			18
		al Design and	5			3			15
		nentation	_						-
Workload		t Preparing							
William		ring a Presentation							
		tations	1						4
		rm Exam and ration for	1			4	ŀ		4
	Midter	rm Exam							
		Exam and ration for Final Exam	1			4	1		4
		( should							
	be em	phasized)							
		Workload	-			_			75
		Workload / 25							75/25
	Course	e Credit (ECTS)				_			3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem  Ability to identify, for	e and pertaining perta			X			
		and solve complex e problems; ability to s apply proper analysis modeling methods fo purpose.	select and s and or this			х			
		Ability to design a consystem, process, develocet under realist constraints and conditions such a way as to meet desired result; ability modern design method purpose.	ice or ic itions, in et the v to apply				x		
		Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applica ability to use informate technologies effective	es and nalysis and problems cations; ation		X				

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.	X			
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	
10	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		
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		x		
12	Knowledge on practices in business, such as project management, risk management and change management.		x		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.			X	
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.		X		

	15 Knowledge about awareness of the legal consequences of engineering solutions.	
The Course's Lecturer(s) and Contact Informations	Doç. Dr. Adnan AKKURT aakkurt@gazi.edu.tr	

Course Description Form									
Course Code and Name	ETM 432 - ComputerAided Design-III								
Course Semester	7-8								
Catalog Content	Starting design with Autodesk Fusion 360, Working with basic tools, Working and smoothing surfaces, Advanced surface modeling and smoothing tools, Drawing tools, student project.								
Textbook	Jaskulski, A. (2015). Autodesk Inventor Professional 2019PL/2019+/Fusion 360: metodyka projektowania. Wydawnictwo Naukowe PWN.								
Supplementary Textbooks	autodesk.com								
Credit	3 ECTS								
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements								
Type of the Course	Elective								
Instruction Language	Turkish								
Course Objectives	To understand the fundamentals of computer aided design, assembly, technical drawings, analysis and simulation								
Course Learning Outcomes	Students who attend this course learn basis of computer-aided design-III.     They can use better and more efficient computational tools while designing.								
Instruction Methods	Expression								

	1.	Getting started with Autod	esk Fusion 36	0 Design							
	Week 2. Week	Working with basic tools									
	3. Week	Working with surfaces-I									
	4. Week	Working with surfaces-II									
	5. Week	Editing surfaces									
	6. Week	Advanced surface modelin	g tools-I								
	7. Week	Editing tools-I	diting tools-1								
Weekly Schedule	8. Week	Editing tools-II									
	9. Week	Advanced surface modelin	g tools-II								
	10. Week	Advanced modeling and editing tools									
	11. Week	Advanced editing tools									
	12. Week	Basics of rendering									
	13.	Surface evaluation and pai	nting								
	Week 14.	Sketching tools, student pr	oject								
	Week 15.										
	Week										
	Weekly th	heoretical course hours: 2									
Teaching and Learning Methods	Weekly to	utorial hours: -									
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 6									
	Internet b	prowsing, library work Design: 5	ning and imple	ementing							
	Report pr	reparing: 0									
	Preparing	g a Presentation: 0									
	Presentat	ions: 0									
	Preparation	on of Midterm and Midterm	Exam: 4								
	Final Exa	m and Preparation for Final		m . i							
			Numbers	Total Weightin g (%)							
		n Exams	1	40							
	Assignn Applica		1	20							
	Projects										
Assessment Criteria	Practice										
	Quiz	of In-term Studies									
	(%)	of in-term studies		60							

Percentage of Final Exam to Total 1 40  Attendance

		Activity	Total Number of Weeks	(w	ura vee	kly			Total Period Work Load
	Weekl Hours	y Theoretical Course	14	4 2			28		
	Weekl	y Tutorial Hours							
	Readir	ng Tasks	3			2			6
	Studie	s	5			3			15
		al Design and	5			4			20
		mentation							
Workload		Preparing ing a Presentation							
		tations							
		m Exam and	1			2			2
		ation for	1			2			2
		m Exam							
		Exam and ation for Final Exam	1			4			4
	Other	( should							
	be emp	phasized)							
		Workload	-			_			75
		Workload / 25							75/25
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		Adequate knowledge mathematics, science engineering subjects to the relevant discipability to use theoret applied information areas to model and sengineering problem  Ability to identify, for and solve complex e problems; ability to sapply proper analysis modeling methods for	e and pertaining line; ical and in these olve s.  ormulate, ngineering select and s and			X		X	
		Ability to design a consystem, process, developroduct under realist constraints and conditions are used as a way as to meet desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective	ice or ic itions, in it the it to apply ods for this elect and es and nalysis and problems eations;				x	X	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific		х		
	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		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.			X	
12	Knowledge on practices in business, such as project management, risk management and change management.		X		
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.	X			

		Knowledge about awareness of the legal consequences of engineering solutions.				X	
The Course's Lecturer(s) and Contact Informations	Department Management tasarim@gazi.edu.tr						

Course Description Form					
Course Code and Name	ETM 434 – ANIMATION APPLICATIONS IN DESIGN				
Course Semester	7-8				
Catalog Content	Introduction, Manipulating objects, Modelling 3D assets, Applying materials and textures, Working with backgrounds, cameras, and lighting, Applications, Rendering a scene, Animating objects and scenes, Working with characters, Adding special effects, Using dynamic animation systems, A design example.				
Textbook	Murdock, K., 3DS Max 2014 Bible – Comprehensive Tutorial Resource, John Wiley & Sons, Inc., Int. Ed., 2014.				
Supplementary Textbooks	Chandler, M., Podwojewski, P., Amin, J. And Herrera, F., 3DS MAX Projects: A Detailed Guide to Modeling, Texturing, Rigging, Animation and Lightnig, 3DTOTAL Pub., 2014.				
Credit	3 AKTS				
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements				
Type of the Course	Selective				
Instruction Language	Turkish				
Course Objectives	Learning animation techniques in design and creating simple animations, choosing color, texture and form properties, learning the properties of balance ratio, proportion and effects				
Course Learning Outcomes	1.Students who attend this course learn basis of animation applications in design.      2.They can use better and more efficient computational tools while designing				
Instruction Methods	Face to face				

	1. Week	Week						
	2. Week	Manipulating objects						
	3. Week	Modelling 3D assets						
	4. Week	Applying materials and textures						
	5. Week							
	6. Week	Applications						
	7. Week	Rendering a scene						
Weekly Schedule	8. Week	Animating objetcs and scenes						
	9. Week	Applications						
	10. Week	Working with characters						
	11. Week	Adding special effects						
	12. Week	Applications						
	13. Week	Using dynamic animation systems						
	14. Week	A general design example.						
	Weekly theoretical course hours: 2							
Teaching and Learning Methods		ntorial hours: 0						
(These are examples. Please fill which		rowsing, library work Design	ning and imple	ementing				
activities you use in the course)	materials:		mig und imple	menting				
	Report preparing: 10							
	Preparing a Presentation: 0							
	Presentations: 0							
	Preparation of Midterm and Midterm Exam: 3							
	Final Exam and Preparation for Final Exam: 4							
			Numbers	Total Weightin g (%)				
	Midterm		1	35	-			
	Assignm Applicat		1	10				
Assessment Criteria	Projects		1	15				
	Practice Quiz							
	_ `	of In-term Studies	60	-				
	Percentage of Final Exam to Total Score (%)							
	Score (%	(a)						

Attendance

	Activity		Total Number of Weeks				Total Period Work Load		
		y Theoretical Course	14			2			28
		Hours Weekly Tutorial Hours		17 2					
		ng Tasks	4			2			8
	Studies		3	2			6		
	Material Design and		5	5			25		
	Implementation Report Preparing			3			23		
Workload		ing a Presentation							
		tations							
	Midter	m Exam and							
		ation for m Exam	1			4			4
		Exam and	1			_			
		ation for Final Exam	1			5			5
		(should phasized)							
		Workload	-			_			76
	Total V	Workload / 25						76/25	
	Course	e Credit (ECTS)							3
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.  2 Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and					x		
		modeling methods for purpose.  Ability to design a consystem, process, developer to a constraint and conditions and conditions are desired result; ability modern design method purpose.  Ability to develop, so use modern technique tools necessary for a solution of complex in engineering applicability to use informatechnologies effective.	omplex ice or ic itions, in at the r to apply ods for this elect and es and malysis and problems eations; ation					x	

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.		х		
6	Ability to work efficiently in intra-disciplinary teams.		х		
7	Ability to work efficiently in multi-disciplinary teams.		х		
8	Ability to communicate effectively in Turkish, both orally and in writing; knowledge of a minimum of one foreign language.	х	-		
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.		х		
10	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			
11	Conformity to ethical principles, professional and ethical responsibility; Information on standards used in engineering applications.		х		
12	Knowledge on practices in business, such as project management, risk management and change management.			X	
13	Knowledge about awareness of entrepreneurship, innovation, and sustainable development.		X		
14	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety.			X	

	Knowledge about awareness of the legal consequences of engineering solutions.
The Course's Lecturer(s) and Contact Informations	Head of Department tasarim@gazi.edu.tr