Course Description Form					
Course Code and Name	ETM 105 - Basic Design-I				
Course Semester	1				
Catalog Content	Introduction to basic design, Design principles, Basic design elements (point, line, surface) and description techniques (horizontal, vertical, inclined, parabolic, complex), Applications, 2D Harmony (concepts of consistent, contrast, proportion etc.), Techniques for 3D.				
Textbook	<ul> <li>Divanlıoğlu, D., Temel Tasar, tasarın öğe ve ilkeleri, Birsen Yay., İstanbul, 1997.</li> <li>Gürer, L. ve Gürer, G., Temel Tasarım, Birsen Yay., İst., 2004.</li> </ul>				
Supplementary Textbooks	<ul> <li>Zelanski, P., Fiscer, M.P., 1995. Design Principles and Problems, Fort Worth: Harcourt Brace.</li> <li>Pentak, D., Pentak, S., 2000, Design Basics, Fort Worth, Harcourt Brace.</li> </ul>				
Credit	3 ECTS				
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements				
Type of the Course	Obligatory				
Instruction Language	Turkish				
Course Objectives	Basic design concepts: form, pattern, composition, theme, organization, colour, texture. Introduction to design problem solving skills. Abstract 2D and 3D design problems.				
Course Learning Outcomes	Students who attend this course learn topics and methods of basic design.				
Instruction Methods	Expression, practice.				

	1. Introduction Week									
	2.	Elements of design								
	Week	Elements of design								
	3. Week	Elements of design								
	4.	4. Elements of design								
	Week	Week								
	5. Week	Elements of design								
	6. Wook	Elements of design								
	7.	Elements of design								
Weekly Schedule	Week	Driverinter of desire								
	o. Week	Principles of design								
	9. Week	Principles of design								
	10.	Principles of design								
	Week									
	11. Week	Forming techniques (3D)								
	12.	Forming techniques (3D)								
	Week	Forming techniques (3D)								
	Week									
	14. Week	Forming techniques (3D)								
	XX7 11 (1									
	Weekly th	eoretical course hours: 2								
Teaching and Learning Methods	Weekly tu	torial hours: 3								
(These are examples. Please fill which	Reading A	Activities: 0								
activities you use in the course)	Internet b	rowsing library work Design	ing and imple	menting						
	materials:	10	ing and imple	including						
	Report pro	eparing: 0								
	 D	- Durantations (								
	Preparing	a Presentation: o								
	Presentati	ons: 4								
	Preparatio	on of Midterm and Midterm E	Exam: 3							
	Final Exa	m and Preparation for Final E	Exam: 10							
			Numbers	Total						
				g (%)						
	Midterm	Exams	1	40						
	Assignm	ent			-					
	Applicat Projects	1011	1	20	-					
Assessment Criteria	Practice		1	20	-					
	Ouiz				-					
	Percent	of In-term Studies		(0)						
	(%)			00						
	Percenta	ge of Final Exam to Total	1	40						
	Score (%	01			1					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Dur (wee hou	ation ekly r)		Total Period Work Load
	Weekl	y Theoretical Course	14		2		28
	Weekl	y Tutorial Hours	14		2		28
	Readin	ig Tasks					
	Studie	5	10		1		10
	Materi Impler	al Design and					
	Report	Preparing					
Workload	Prepar	ing a Presentation	3		3		9
	Presen	tations					
	Midter Preper Midter	m Exam and ation for m Exam					
	Final E Preper	Exam and ation for Final Exam					
	Other (	should					
	be emp	onasized) Vorkload	_		_		75
	Total V	Workload / 25					75/25
	Course	Credit (ECTS)					3
	No	Program Outcom	nes	1 2	3 4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1       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.					x	
		Ability to identify, fo and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this			x	
		Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.			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.			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.			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.				X	

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

Course Description Form						
Course Code and Name	ETM 106 – BASIC DESIGN-II					
Course Semester	2					
Catalog Content	Problem solving, Problem definition exercises, Basic problem solving exercises, Discussion on 3D design and space, Exercise on 3D design and space, The concept of structure, Structural exercise sketches, Structural exercise, materials and finalization, Relation between function and material, Relation between function and form, Form based, function and material exercises					
Textbook	<ol> <li>De Bone, E. 1990 Lateral Thinking: Creativity Step-By-Step, HarperCollins.</li> <li>O'Connor, J. and McDermott, I. 1997. The Art of Systems Thinking: Essential Skills for Creativity and Problem Solving, Thorsons Pub.</li> <li>Landa, R. 1998. Thinking Creatively: New Ways to Unlock Your Visual Imagination, North Light Books.</li> <li>Lauer, D., Pentak, S. 2008. Design Basics, Boston: Thomson Woodsworth.</li> </ol>					
Supplementary Textbooks	<ol> <li>Computer-Aided Design</li> <li>Int. Journal of Design Engineering</li> </ol>					
Credit	3 ECTS					
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Obligatory					
Instruction Language	Turkish					
Course Objectives	<ol> <li>Designing a network of visual relations / a creative problem solving process</li> <li>Conducting experimental studies to test different materials</li> <li>Developing 3D functional basic systems design</li> <li>Studies on form-function relationship</li> </ol>					
Course Learning Outcomes	<ol> <li>Students attending this course learn topics and methods of basic design.</li> <li>They can make basic and medium level designs.</li> </ol>					
Instruction Methods	Face to face					

	1. Week	Problem solvi	ing				
	2. Week	Problem defir	nition exercises				
	3. Week	Basic problem					
	4. Week	Discussion or					
	5. Week	Exercise on 3	D design and space				
	6. Week	The concept of	of structure				
	7. Week	Structural exe	ercise sketches				
Weekly Schedule	8. Week	Midterm exar	n				
	9. Week	Structural exe	ercise, materials and finalization				
	10. Week	Relation between function and material					
	11. Week	Relation betw	veen function and form				
	12. Week	Form based, f	function and material exercises				
	13. Week	Function base	ed problem solving				
	14. Week	Function base	ed problem solving sketches				
	Weekly theo	retical course h	nours: 2				
Teaching and Learning	Weekly tuto:	rial hours: 0					
Methods	Reading Act	ivities: 2					
	Internet brow	vsing, library w	ork Designing and implementing mate	erials: 0			
	Report prepa	aring: 1					
	Preparing a 1	Presentation: 1					
	Presentation	s: 1					
	Preparation	of Midterm and	l Midterm Exam: 10				
	Final Exam	and Preparation	n for Final Exam: 10				
			Numbers	Total Weighting (%)			
	Midterm E	xams					
	Assignmen	t					
	Application Projects	1	3	60			
Assessment Criteria	Practice		5	00			
	Quiz						
	Percent of Studies (%	In-term		60			
	Percentage	of Final					
	Exam to To (%)	otal Score	1	40			
	Attendance						

		Activity	Total Number of Weeks	Durati (weekl hour)	on y	Total Period Work Load
	Weekl	y Theoretical Course	14	2	2	28
		y Tutorial Hours	5 2		10	
	Readin	ng Tasks				
	Studies	S				
	Materi	al Design and	4	4	5	20
	Report	Prenaring				
Workload	Prepar	ing a Presentation				
	Presen	tations				
	Midter Preper Midter	m Exam and ation for m Exam	3	3	3	9
	Final E	Exam and	2	2	1	8
	Preper Other	ation for Final Exam				
	be emp	phasized)				
	Total V	Workload	-	-	-	75
	Total Workload / 25					75/25
	Course	e Credit (ECTS)				3
	No	Program Outcom	ies	1 2 3	3 4 5	5
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 Adequate knowledge in mathematics, science an engineering subjects per to the relevant discipline ability to use theoretical applied information in th areas to model and solve engineering problems.		x		
		2 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 co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		X	_
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informate technologies effectiv	elect and es and nalysis and problems ations; ation rely.	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.		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.		x	
The Course's Lecturer(s) and Contact Informations		Doç. Dr. Hamza ÇINAR hamzacinar@gazi.edu.tr			

Course Description Form						
Course Code and Name	ETM 107 – INTRODUCTION TO DESIGN ENGINEERING					
Course Semester	1					
Catalog Content	Introduction, The meaning and importance of design, Historical development of design, The importance of design for the national and industrial development, Important designs and innovations, The methodology of design and its rules, Fundamentals of design, Elementary design process, Analysing simple part designs, Component design, Analysing simple system designs, System design, Applications of system designs.					
	Parameswaran, M.A., An Introduction to Design Engineering, Alpha Science Pub., Int. Edition, 2004					
Textbook	Cross, N., Engineering Design Methods-Strategies for Product Design, John Wiley & Sons, Ltd., New York, 2001.					
Supplementary Textbooks	Elder, W.E. ve Hosnedl, S., Design Engineering: A Manual for Enhanced Creativity, CRC Press, Int. Edition, 2008.					
	Börklü, H.R. web sitesi.					
Credit	2 AKTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	To inform students about the introduction to design engineering, industrial design engineering profession definition and scope. Giving detailed information about the fields of activity of industrial design engineering, making brief introductions for four-year undergraduate education.					
Course Learning Outcomes	<ol> <li>Students who take this course learn the subjects and methods of introduction to design engineering.</li> <li>Can make simple and elementary level designs.</li> </ol>					
Instruction Methods	Face to face Practical training					

	1. Week	Introduction								
	2.	The meaning and important	ce of design							
	Week	Historical development of	dasian							
	3. Week	Historical development of a	uesign							
	4.	The importance of design f	or the national	l and industria	ıl					
	Week	week development								
	5. Week	Important designs and inno	vations							
	6. Week	The methodology of design	and its rules							
	7.	Fundamentals of design								
Weekly Schedule	<b>Week</b> 8.	Elementary design process								
	Week									
	9. Week	Analysing simple part desig	gns							
	10. Week	Component design								
	11. Week	Applications of component	designs							
	12.	Analysing simple system de	esigns							
	Week 13.	System design								
	Week									
	14. Week	Applications of system designs								
	Weekly th	eoretical course hours: 2								
Teaching and Learning Methods	W1-1 4	4								
Teaching and Learning Methods	weekiy tu	torial hours: 0								
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0								
uctivities you use in the course)	Internet bi	owsing, library work Design	ing and imple	ementing						
	materials:	5								
	Report pre	eparing: 0								
	Preparing	a Presentation: 0								
	Presentatio	ons: 0								
	D		2							
	Preparatio	in of Mildterm and Mildterm I	Exam: 3							
	Final Exa	n and Preparation for Final I	Exam: 4	Total						
		Weightin								
	Midterm	g (%)           Midterm Exams         1         40								
	Assignment									
	Applicat	pplication 1 20								
Assessment Criteria	Projects				-					
	Practice				-					
	of In-term Studies		60	-						
	(%)									
	Percenta	ge of Final Exam to Total		40						
Score (%)										

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Dur (wee hou	ation ekly r)		Total Period Work Load
	Weekly Hours	y Theoretical Course	14		2		28
	Weekl	y Tutorial Hours					
	Readin	g Tasks					
		5	1	5			5
	Materi	al Design and	2	5			10
	Implen	Preparing	_				
Workload	Prepar	ing a Presentation					
	Presen	tations					
	Midter	m Exam and					
	Preper	ation for	1		3		3
	Final E	Exam and					
	Preper	ation for Final Exam	1		4		4
	Other (	(should phasized)					
	Total V	Workload	-		-		50
	Total V	Workload / 25					50/25
	Course	Credit (ECTS)					2
	No	Program Outcom	nes	1 2	2 3 4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	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.					
		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.			X			
	4 Ability to develop, select and use modern techniques and tools necessary for analysis and solution of complex problems in engineering applications; ability to use information technologies effectively.				X		

5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.			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.		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.			х		
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.		X	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

	Course Description Form
Course Code and Name	ETM 109 – COMPUTER PROGRAMMING
Course Semester	1
Catalog Content	Introduction, Variables, Input and output, Arithmetic operations in programming, Binary algebraic logic, If-if and not-changing statements, Strings, Loops, Recognizing objects, Methods (methods), Operations with many objects, Arrays (indexed variables), Exceptional state operations, preparing GUI programs using Windows forms.
Textbook	<ul><li>Halvorson, M, Step by Step Misrosoft Visual Basic 2013, Microsoft Press, USA, 2013.</li><li>Inducate Learning Technologies, Beginnig Visual Basic Programming, 2012.</li></ul>
Supplementary Textbooks	C Dersi Programlama Giriş, N.E.ÇAGILTAY, C.F.SELBES, G.TOKDEMİR, Ç.TURHAN
Credit	2 AKTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn the rules of computer subjects and programming concepts, to gain skills for the application of learned programming concepts in C programming language.
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of computer programming.</li> <li>They can create complicated and basic computer programs.</li> </ol>
Instruction Methods	Face to face Practical training

	1. Week	Introduction								
	2.	Variables								
	Week	T / 1 / /								
	3. Week	Input and output								
	4. Week	Using arithmetic in program	nming							
	5. Week	Boolean logic								
	6. Week	If-Else and switch statemer	nts							
Weekly Schedule	7. Week	Strings								
Weekly Schedule	8. Week	Loops								
	9. Week	Learning about objects								
	10. Week	Methods								
	11. Week	Managing multiple objects								
	12. Week	Arrays								
	13.	Exception handling, inherit	ance							
	14. Week	GUI Programming using Windows forms								
	Weekly th	eoretical course hours: 2								
Teaching and Learning Methods	Weekly tu	torial hours: 1								
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0								
acarraces you use in the course)	Internet bi materials:	rowsing, library work Desigr 3	ing and imple	menting						
	Report pro	eparing: 0								
	Preparing	a Presentation: 0								
	Presentati	ons: 0								
	Preparatio	on of Midterm and Midterm I	Exam: 3							
	Final Exa	m and Preparation for Final I	Exam: 4							
		Numbers Total Weightin								
				g (%)						
	Midterm	Iterm Exams 1 40								
	Assignm	ssignment								
	Applicat	pplication								
Assessment Criteria	Projects		1	20	-					
	Ouiz				-					
	Percent	of In-term Studies		60	1					
	(%)	an term Studies								
	Percenta	ge of Final Exam to Total		40	1					
	Score (%	(i)			1					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Du (we hou	ratie eekly 1r)	on y		Total Period Work Load
	Weekly	y Theoretical Course	14		2	2		28
	Weekl	y Tutorial Hours	14		1			14
	Readin	g Tasks						
		5						
	Materi Implen	al Design and nentation	1	3				3
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Prepera Midter	m Exam and ation for m Exam	1		2	2		2
	Final E	Exam and	1		3			3
	Other (	should						
	be emp	bhasized)						50
	Total V	Vorkload	-		-			20
	Course	Credit (ECTS)						2
	Course	Program Outcom	nes				_	2
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	No       1 of roginal 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				x		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose. Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informatechnologies effectiv	omplex ice or ic itions, in et the $\gamma$ to apply ods for this elect and es and nalysis and problems eations; ation 'ely.				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.		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.			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.		X	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

	Course Description Form
Course Code and Name	ETM 111 – DESCRIPTIVE GEOMETRY-I
Course Semester	1
Catalog Content	Introduction (importance and description of descriptive geometry), Orthographic projection, The projection of a point, The projection of lines (general description), The projection of lines (true length and angles), The projection of planes (general description), The projection of planes (edge view and normal view), Multi-auxiliary views, Intersections of planes, Parallelism and perpendicularity, Revolved-view method, Intersections of planes and objects, Intersections of objects, Developments.
Textbook	<ol> <li>Bayvas, Ş., Dericioğlu, N. ve Özgönül, O., Tasarı Geometri Temel Metot ve Uygulamalar I-II, Ankara, 1969.</li> <li>Practical Descriptive Geometry by William Griswold Smith</li> </ol>
Supplementary Textbooks	Descriptive Geometry for Students of Engineering by James Ambrose Moyer
Credit	2 ECTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	Teaching topics and rules of descriptive geometry, gaining capabilities for its applications.
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of descriptive geometry.</li> <li>They can solve basic level problems related to descriptive geometry.</li> </ol>
Instruction Methods	Face to face

2. Week       Orthographic projection         3. Week       The projection of a point         4. Week       The projection of lines (general description)
3. Week       The projection of a point         4. Week       The projection of lines (general description)
4. Week The projection of lines (general description)
5. Week The projection of lines (true length and angles)
6. Week The projection of planes (general description)
7. Week The projection of planes (edge view and normal view)
Weekly Schedule         8. Week         Multi-auxiliary views
9. Week Intersections of planes
10.     Parallelism and perpendicularity       Week     Parallelism and perpendicularity
11.     Revolved-view method       Week     Kethod
12. Intersections of planes and objects
Week       13.     Intersections of objects
Week       14.       Developments
Weekly theoretical course hours: 2
weekly incoretical course nours. 2
Teaching and Learning     Weekly tutorial hours: 0       Methods     Image: Comparison of the second secon
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 (%)
Midterm Exams 1 30
Assignment 2 20
Application 1 10
Assessment Criteria Projects
Practice
Percent of In-term 60 Studies (%)
Percentage of Final Exam to Total Score (%)
Attendance

		Activity	Total Number of Weeks	Du (w ho	ura veek our)	tion dy	ı		Total Period Work Load
	Weekl	y Theoretical Course	14			2			28
	Weekl	y Tutorial Hours	10			1			10
	Readir	ıg Tasks							
	Studie	5							
	Materi	al Design and	1			5			5
	Report	Preparing							
Workload	Prepar	ing a Presentation							
	Presen	tations							
	Midter Preper	m Exam and ation for	1			3			3
	Midter	m Exam							
	Final H Preper	Exam and ation for Final Exam	1			4			4
	Other	( should							
	be emp Total V	ohasized) Vorkload	_			_			50
	Total V	Workload / 25							50/25
	Course	e Credit (ECTS)							2
	No	Program Outcom	nes	1	2	3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	No       0         I       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 engineering problems.					x			
		apply proper analysis modeling methods fo purpose.	s and or this		2	x			
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this			2	ĸ		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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.		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.		x	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

Course Description Form								
Course Code and Name	ETM 112 - COMPUTER AIDED TECHNICAL DRAWING							
Course Semester	2							
Catalog Content	Introduction (summary of previous lectures), Geometric dimensioning and tolerancing, Applications of working drawings, Assembly drawings, Standard parts and their illustrations in assembly drawings, Assembly numbering and bill of materials, Applications of assembly numbering, Drawing of detailed part drawings based on assembly drawings, Applications, Analysing simple designs and preparing their assembly drawings, Applications, Elements for joining used in assemblies (bolted connections, keys, springs) and their illustrations, Gears and cams, Applications.							
Textbook	<ol> <li>Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003.</li> <li>Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012.</li> </ol>							
Supplementary Textbooks	Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.							
Credit	3 ECTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Obligatory							
Instruction Language	Turkish							
Course Objectives	To teach the use of two-dimensional drawing commands of AutoCAD program, to teach the basic concepts of technical drawing, to extract the views of a given part of perspective, to teach the perspective of a given part of the views, to teach special views, to teach section types and cross-sections							
Course Learning Outcomes	<ul> <li>Students who attend this course learn topics and methods of advanced technical drawing.</li> <li>They can draw complicated and advanced level technical drawings.</li> </ul>							
Instruction Methods	Expression, practice.							

	1. Introduction (summary of previous lectures)								
	2.	Geometric dimensioning an	d tolerancing						
	Week		•						
	3. Week	Applications of working dra	awings						
	4.	Assembly drawings							
	Week								
	5. Week	Standard parts and their illustrations in assembly drawing: Week							
	6. Week	Assembly numbering and b	ıls						
	7.	Applications of assembly m	umbering						
Weekly Schedule	Week 8	Drawing of detailed part dr	awings based	on assembly o	Irawings				
	Week	Drawing of dounted part at	uvings oused	on assembly c	inu vings				
	9. Week	Applications							
	10. Week	Analysing simple designs a drawings	nd preparing	their assembly	,				
	11. Week	Applications							
	12.	Elements for joining used in	n assemblies (	bolted connec	ctions,				
	Week 13.	keys, springs) and their illus Gears and cams	strations						
	Week	Week							
	14. Week	Applications							
	Weekly th	eoretical course hours: 3							
Teaching and Learning Methods	Weekly tu	torial hours: 2							
(Those are examples Plags fill which	Deading	ativitian 5							
activities you use in the course)	Reading A	Activities: 5							
	Internet bi materials:	rowsing, library work Design 8	ing and imple	ementing					
	Report pre	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm E	Exam: 6						
	Final Exa	m and Preparation for Final E	Exam: 6						
			Numbers	Total Weightin					
		-		g (%)					
	Midterm	40							
	Applicat	ion	1	20					
	Projects								
Assessment Criteria	Practice				]				
	Quiz								
	Percent (%)	Percent of In-term Studies 60							
	Percenta	ge of Final Exam to Total	1	40					
	Score 1%								

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Dur (wee hou	atio ekly r)	n		Total Period Work Load
	Weekly	y Theoretical Course	14		2			28
		y Tutorial Hours	14		1			14
		ng Tasks	5	1			5	
	Studies	S	4	4				16
	Materi	al Design and						
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	2		3			6
	Final F	Exam and	2		3			6
	Other (	ation for Final Exam						
	be emp	ohasized)						
	Total V	Workload	-		-			75
	Total V	Workload / 25						75/25
	Course	e Credit (ECTS)						3
Contribution Level Between Course Learning Outcomes and Program Outcomes	NoProgram Outcomes1Adequate 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.2Ability to identify, formulate,				x x	4 x	5	
		problems; ability to s apply proper analysis modeling methods fo purpose.	select and s and or this					
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this				x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems eations; ation ely.		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.			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.		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.		x		
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 113 – TECHNICAL DRAWING-I							
Course Semester	1							
Catalog Content	Introduction (basic terms, material and tools, scales, paper sizes), Line and lettering types, Constructional geometry, Applications of constructional geometry, Orthographic projection and drawing, Drawing applications, Sectional views and conventions, Applications, Dimensioning and tolerancing, Pictorial drawings, Surface texture, Standardized tolerances and fits, Working drawings.							
	1. Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003.							
Textbook	<ol> <li>Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ank., 2012.</li> </ol>							
	3. Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.							
Supplementary Textbooks	<ol> <li>Journal of Engineering Design</li> <li>Computed-Aided Design</li> </ol>							
Credit	3 ECTS							
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Obligatory							
Instruction Language	Turkish							
Course Objectives	A designer must use technical drawing language as a universal graphic language to share and communicate design concepts, ideas, and constraints between colleagues and manufacturers. Therefore, the design engineer has to understand and use the basic concepts of this graphic language. The aim of this course is to provide students with the necessary skills for correct communication through engineering drawings.							
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of technical drawing.</li> <li>They can draw simple and elementary level technical drawings.</li> </ol>							
Instruction Methods	Face to face							

	1. Week	Introduction (basic terms, material and tools, scales, paper sizes)								
	2. Week	Line and lettering types								
	3. Week	Construction	Constructional geometry							
	4. Week	Applications of constructional geometry								
	5. Week	Orthographic projection and drawing								
	6. Week	Drawing app	Drawing applications							
	7. Week	Drawing app	lications							
Weekly Schedule	8. Week	Sectional vie	ws and conventions							
	9. Week	Applications								
	10. Week	Dimensionin	g and tolerancing							
	11. Week	Pictorial drav	wings							
	12. Week	Surface textu	ire							
	13. Week	Standardized	tolerances and fits							
	14. Week	Working drawings								
	Weekly theoretical course hours: 2									
Teaching and Learning	Weekly tuto	Veekly tutorial hours: 0								
Methods	Reading Act	ivities: 2								
	Internet brow	wsing, library	work Designing and implemer	ting 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 F	vams	1	30						
	Assignmen	it	2	20						
	Application	n	1	10						
Assessment Criteria	Projects									
Assessment eriteriu	Practice									
	Percent of Studies (%	In-term		60						
	Percentage Exam to To (%)	of Final otal Score		40						
	Attendance	e								
		Activity	Total Number of Weeks	Duration (weekly hour)		)n		Total Period Work Load		
---	----------------------------	--	--	------------------------------	---	----	---	---------------------------------	-------	
	Weekly Hours	y Theoretical Course	14			2			28	
	Weekly Tutorial Hours		14			1			14	
	Readin	ıg Tasks								
	Studies	5	1			5			5	
	Materi	al Design and	2			5			10	
	Report Preparing									
Workload	Prepar	ing a Presentation								
	Presen	tations								
	Midter Preper Midter	m Exam and ation for m Exam	2			3			6	
	Final H	Exam and	3			4			12	
	Other 0	ation for Final Exam								
	be emp	bhasized)								
	Total V	Workload	-			-			75	
	Total V	Workload / 25							75/25	
	Course	Credit (ECTS)			1		1		3	
	No	Program Outcom	nes	1	2	3	4	5		
Contribution Level Between Course Learning Outcomes and Program Outcomes	1	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.				x				
	2	Ability to identify, for and solve complex er problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this			x				
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this				x			
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.		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.		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.		x	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 203 ENGINEERING MECHANICS-I						
Course Semester	3						
Catalog Content	General principles. Force vectors: Vector operations, equilibrium of a particle, Equilibrium of 3D systems, Resultant of vorce systems, Moment of a couple, Distributed forces, Equilibrium of a body, Equivalent force systems in bodies. Structural analysis, trusses and frames and machines, internal forces, friction. Centroid and center of gravity. Moment of inertia. Method of virtual work. Introduction to dynamics. Particle kinematics and kinetics. Kinematics and kinetics of rigid body.						
Textbook	Hibbeler, "Engineering Statics", 14th Edition						
Supplementary Textbooks	<ol> <li>Hibbeler, Engineering Mechanics</li> <li>Ferdinand P. Beer, "Engineering Statics"</li> </ol>						
Credit	3 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Investigation of the balance of rigid body by using fundamental principles of mechanics. Establishing the necessary background for the solution of engineering problems in the areas of strength of materials, dynamics and machine theory.						
Course Learning Outcomes	<ol> <li>Learning of the subjects and methods of Engineering Mechanics-I</li> <li>Learning the usage of engineering mechanics in design problems.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	Introduction to static and so Concepts and Principles. U	olid mechanic nit Systems,	s					
	2. Week	Vectors, orthogonal compo separation, Newton's laws	onents of force	and compone	nts				
	3. Week	Forces on surface and spac balance, Free body diagram	e, n (SCD)						
	4. Week	Rigid bodies, internal and o support types	external forces	s, equivalent fo	orces,				
	5. Week	Composite force systems, I Balance of objects	Moment conce	ept, Rigid					
	6. Week	Structural analysis, Structu Analysis and calculation, N	ral systems, T lode and section	russ systems, on method					
Weekly Schedule	7. Week 8. Week	Carrier systems, Frames an and account Internal forces in beams an flayural strength of beams	plementation buted forces,						
	9. Week	Force-Moment diagram							
	10. Week	Center of gravity, Center o Moment of inertia, Momen	f gravity of the transformed to find the transformed by the transforme	e areas, fields					
	11. Week	Friction, dry friction laws, coefficients, wheel friction	friction , belt-pulley, f	riction	stion				
	12. Week	12.         Virtual work principle           Week         Virtual work principle							
	13.Introduction to dynamics. Particle kinematics and kineticsWeek								
	14. Week	Solid body kinematics and kinetics							
	Weekly theoretical course hours: 3								
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(Those and engine log Diagoo fill which	Reading A	Activities: 0							
activities you use in the course)	Internet b	rowsing, library work Desigr	ning and imple	ementing					
	materials:	15							
	Report pro	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm I	Exam: 3						
	Final Exa	m and Preparation for Final I	Exam: 4						
			Numbers	Total Weightin g (%)					
	Midterm	n Exams	1	30					
	Assignm	ient	5	15					
	Application Projects								
Assessment Criteria	Practice								
	Quiz	15							
	Percent (%)	60							
	Percenta Score (%	ge of Final Exam to Total 6)		40					

Attenda	nce								
		Activity	Total Number of Weeks	TotalDurationJumber(weeklyWeekshour)					Total Period Work Load
	Weekl Hours	y Theoretical Course	14			3			42
	Weekl	y Tutorial Hours							
	Readin	ıg Tasks	5			1			5
	Studie	5							
	Materi Implen	al Design and nentation							
Worklood	Report	Preparing							
w of kloau	Prepar	ing a Presentation							
	Presen	tations	1			3			3
	Midter Preper Exam	m Exam and ation for Midterm							10
	Final F Preper	Exam and ation for Final Exam	5			3			15
	be emr	snould bhasized)							
	Total V	Vorkload							75
	Total V	Workload / 25							3
	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 theoreti applied information i areas to model and sc engineering problem Ability to identify, fo and solve complex en problems; ability to s apply proper analysis	e in e and pertaining line; ical and in these olve s. ormulate, ngineering select and s and				x		
	3	modeling methods for purpose. Ability to design a co system, process, devi product under realist constraints and condi such a way as to mee desired result; ability modern design metho purpose. Ability to develop, so use modern techniqu tools necessary for an solution of complex p in engineering applic ability to use informat technologies effectiv	or this omplex ice or ic itions, in it the to apply ods for this elect and es and nalysis and problems sations; ation ely.					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 in in in in in in in in in in in in			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.			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.       x	
The Course's Lecturer(s) and Contact Informations	Doç. Dr. Ahmet TAŞKESEN taskesen@gazi.edu.tr	

Course Description Form							
Course Code and Name	ETM 204 Engineering Mechanics-II						
Course Semester	4						
Catalog Content	Introduction and fundamental principles. Mechanical properties of the materials, Stress-Strain transformations, Bending, Shear force, Beam design, Buckling, Torsion, Combined stress, Mohr circle, Applications, A general design exercise.						
Textbook	<ol> <li>Russell C. Hibbeler, Mechanics of Materials, 10th Edition-Pearson (2016).</li> <li>Hibbeler, Engineering Mechanics: Dynamics, Prentice-Hall, Inc, Int. Ed.</li> </ol>						
Supplementary Textbooks	F. Beer, Mechanics of Materials.						
Credit	3 AKTS						
<b>Prerequisites of the Course</b> ( <i>Attendance Requirements</i> )	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Based on the fundamental mechanics, teaching of fundamental strength principles such as stresses, mechanics of materials etc. Establishing the necessary background for the solution of engineering problems in the areas of machine elements, theory of machines and machine design.						
Course Learning Outcomes	<ol> <li>Learning of the subjects and methods of Engineering Mechanics-II</li> <li>Learning the usage of engineering mechanics in design problems.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	Introduction – Stress conce	pt and types.	Design consid	lerations.				
	2.	Axial loading. Normal stres	ss, Shear stres	s. Bearing stre	esses in				
	Week	bolts and rivets. Strain concept							
	Week	P							
	4. Week	Mechanical properties of the stress and strain. Hook's la	ne materials. F w. Young mo	Relationship b dulus.	etween				
	5. Week	Repeated loads. Problems of Poisson ratio. Saint-Venant	caused by tem t principle.	perature varia	tions.				
	6. Week	I orsion. Deformations of circular shafts. Torsion angle in elastic range. Design of power transmission shafts.							
Weekly Schedule	7. Week	I orsion. Deformations of non-circular shafts. Thin walled shafts.							
	8. Week	Pure bending. Stresses and deformations in elastic range. Diagrams of shear force and bending moment.							
	9. Week	Bending and deflection in b	beams. Elastic	curve equation	on.				
	10.	Shear stresses in beams. Str	ress-strain trai	nsformations.					
	Week	Plane stress transformation	s. Principle st	resses: Maxin	um shear				
	Week	stress.							
	12. Week	Mohr circle in plane stress							
	13.	Buckling. Stability of the st	tructures; Eule	er formula.					
	Week 14. Week	A general design example							
	Weekly th	eoretical course hours: 3							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0							
	Internet bi materials:	rowsing, library work Design 5	ing and imple	ementing					
	Report pro	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm I	Exam: 3						
	Final Exa	m and Preparation for Final I	Exam: 4	T-4-1					
			numbers	I otal Weightin g (%)					
	Midterm	Exams	1	30					
	Assignm Applicat	ion	5	15					
Assessment Criteria	Projects								
	Practice Quiz		5	15					
	Percent (%)	of In-term Studies		60					
	Percenta Score (%	ge of Final Exam to Total		40					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Total Duration umber (weekly Weeks hour)				Total Period Work Load	
	Weekly	y Theoretical Course	14		3			42	
	Weekl	y Tutorial Hours							
	Reading Tasks		5		1			5	
	Studies	5	5		1			5	
	Materi	al Design and							
	Implen	nentation							
Workload	Prepar	ing a Presentation	1	3			3		
	Presen	tations	1	3					
	Midter	m Exam and							
	Preper	ation for	2		5			10	
		m Exam Exam and							
		ation for Final Exam	2		5			10	
	Other (	(should							
	Total V	Workload						75	
	Total V	Workload / 25						75/25	
	Course	Credit (ECTS)						3	
	N.	Program Outcom	nes	1 /	2	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 is areas to model and sc engineering problem Ability to identify, fo and solve complex er problems; ability to s	e in e and pertaining pline; ical and in these olve s. prmulate, ngineering select and			x			
	3	apply proper analysis modeling methods fo purpose. Ability to design a co	s and or this				x		
		system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	ice or ic itions, in et the / to apply ods for this						
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and nalysis and problems cations; ation rely.				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.		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.			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.       x
The Course's Lecturer(s) and Contact	Doç. Dr. Ahmet TAŞKESEN
Informations	taskesen@gazi.edu.tr

Course Description Form						
Course Code and Name	ETM-205 Product Design-I					
Course Semester	4					
Catalog Content	By this course, the students will be able to recognize the elements used in mechanical design and using the basic engineering sciences to realize the geometric dimensioning by considering the design principles. They will have knowledge about the application areas of these structures.					
Textbook	<ol> <li>Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara</li> <li>Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi.</li> </ol>					
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi					
Credit	3 AKTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	<ol> <li>To teach different machine drawings according to Turkish standards and World standards</li> <li>Teaching machine science elements and their analysis.</li> <li>To teach industrial design engineers' common problems and practical approaches they need to know during project design.</li> </ol>					
Course Learning Outcomes	<ol> <li>To be able to define the design problem</li> <li>To be able to evaluate and develop design</li> <li>To be able to design simple apparatus, mechanisms and machines</li> <li>To be able to select materials by considering design and functional properties</li> </ol>					
Instruction Methods	Face to face Practical training					

	1. Week	Introduction, basic concepts						
	2.	Gear wheels - Spur gears						
	Week	Gear wheel mechanisms - I	Jelical gears					
	J. Week	ek						
	4.	4. Gear wheel mechanisms - Bevel gears						
	Week	Sizing of gear wheels and their use in design						
	5. Week	Week						
	6. Week	6. Profile scroll						
	7.	Gear mechanisms and appl	ications in des	sign systems				
Weekly Schedule	Wеек 8.	Chain gear mechanisms and	d their use in c	lesign				
	Week		. 1.1	- 				
	9. Week	Sizing of belt pulley mecha	inisms and the	eir use in desig	gn			
	10. Week	Examples of construction						
	11.	Assembly drawing and deta	ail drawing co	ncepts				
	Week							
	12. Week	Assembly drawing and detail drawing applications						
	13. Wash	Assembly drawing and detail drawing applications						
	Wеек 14.	Assembly drawing and detail drawing applications						
	Week							
	Weekly th	eoretical course hours: 2						
Teaching and Learning Methods	Weekly tu	torial hours: 2						
(Those are another Diago fill which	Deading	ativitian 0						
activities you use in the course)	Reading A	cuvilles: 0						
	Internet bi materials:	rowsing, library work Design 4	ing and imple	ementing				
	Donort mu	anarina. A						
	Report pre	eparing: 4						
	Preparing	a Presentation: 0						
	Presentati	ons: 0						
	Preparatio	on of Midterm and Midterm I	Exam: 3					
	Final Exa	m and Preparation for Final I	Exam: 4					
			Numbers	Total Weightin				
				g (%)				
	Midterm	Exams	1	30	_			
	Assignm	ion	10	30	-			
	Projects	1011	10	50	-			
Assessment Criteria	Practice							
	Quiz							
	Percent	60						
	(%)			40	4			
	Percenta Score (%	ge of Final Exam to Total		40				

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Duratio (weekly hour)	n	Total Period Work Load
Workload	Weekl	y Theoretical Course	14	2		28
	Weekl	y Tutorial Hours	14	2		28
	Readin	ıg Tasks				
	Studie	5	2	2		4
	Materi	al Design and	2	2		4
Workload P		Report Preparing		2		4
		Preparing a Presentation				
	Presen	tations				
		m Exam and ation for m Exam	1	3		3
		Exam and	1	4		4
		should		_		
		bhasized)				
		Workload	-	-		75
		Workload / 25				75/25
	Course	Program Outcom	205			3
	No		105	1 2 3	4 5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 Adequate knowledge in mathematics, science and engineering subjects pertaini to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			x	
		2 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 co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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.		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.			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.		X	
The Course's Lecturer(s) and Contact Informations	1.	Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr			

	Course Description Form
Course Code and Name	ETM 207 - Freehand Sketching and Drawing Techniques in Designing
Course Semester	3
Catalog Content	An overview of freehand sketching, Methods and techniques of freehand sketching, Drawing materials and environments, Visulaization of ideas, Drawing techniques – Perspective, Dimensions, ratio, Light, shadow, Coloring, Description techniques for product design, Quick freehand sketches
Textbook	<ol> <li>Stanyer, P., The Complete Book of DRAWING TECHNIQUES (A Professional Quide for the Artist, Arcturus Pub., UK., 2003.</li> <li>Necati İnceoğlu, Murat Soygeniş, Ela Çil, Tasarımda Eskizler, Yıldız Teknik Üniverstesi Yay., İstanbul, 1997. Necati İnceoğlu, Tan Gürer, Ela Çil, Düşünme ve Anlatım Aracı Olarak Eskizler, Helikon Yay., İstanbul, 1995. Muhlis Türkmen, Istanbul ve Tarihi Evleri: 1950 - 1985, Yay Yay. İstanbul.</li> </ol>
Supplementary Textbooks	Design Sketching by Erik Olofsson and Klara Sjolen.
Credit	2 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	The aim of the course is to comprehend the creative process behind the design work, to be familiar with the basic information and conceptual works on this subject, to improve the ability of the designer to put the image of the mind in the paper and the quality of perspective and line before the design.
Course Learning Outcomes	<ul> <li>Students who attend this course learn topics and methods of freehand sketching and drawing techniques in designing.</li> <li>They can make better freehand sketches and drawings.</li> </ul>
Instruction Methods	Expression, practice.

	<b>1.</b> Presentation of course content, period expectation							
	Week	grading systems.						
	2.	An overview of freehand sl	ketching					
	Week		0 1 5 5					
	3. Week	wiethods and techniques of freehand sketching						
	1 1	4 Drawing materials and environments						
	4. Week	Week						
	5.	5. Visulaization of ideas						
	Week	Week						
	6. Week	6. Drawing techniques - Perspective						
	7.	Drawing techniques - Dime	ensions, ratio					
Weekly Schedule	Week	Duraniu - ta duri aura I i du						
	ð. Week	Drawing techniques - Light	, snadow					
	9.	Drawing techniques - Colo	ring					
	Week	Drawing techniques - Colo	rina					
	Week	Drawing woninques - Colo	. 111 <u>2</u>					
	11.	Description techniques for	product design	n				
	Week							
	12. Week	Description techniques for	product design	n				
	13.	Ouick freehand sketches						
	Week							
	14. Week	. Quick freehand sketches						
<b>Teaching and Learning Methods</b> (These are examples. Please fill which activities you use in the course)	<ul> <li>Weekly theoretical course hours: 2</li> <li>Weekly tutorial hours: 2</li> <li>Reading Activities: 0</li> <li>Internet browsing, library work Designing and implementing materials: 2</li> <li>Report preparing: 0</li> <li>Preparing a Presentation: 0</li> <li>Presentations: 0</li> </ul>							
			- 4					
	Final Exai	m and Preparation for Final I	Exam: 4 Numbers	Total				
				Weightin				
	Midterm	Exams	1	40				
	Assignm	ent						
	Applicat	Application						
Assessment Criteria	Projects	rojects						
	Ouiz		1	20				
	Percent	of In-term Studies		60				
	(%)	60						
	(,,,)							

Percentage of Final Exam to Total Score (%)	1	40
Attendance		

		Activity	Total Number of Weeks	Du (we hou	ratie eekly ur)	on y		Total Period Work Load
	Weekly	y Theoretical Course	14		1			14
	Weekly	y Tutorial Hours	14		1			14
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes	Readin	g Tasks						
S M Li F		8	2		2			4
	Materi	al Design and						
	Report	Prenaring						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter	m Exam and	2		3			6
	Prepera Midter	ation for m Exam						
		Exam and	3		4			12
		ation for Final Exam						
		hasized)						
		Vorkload	-		-			50
		Total Workload / 25						50/25
	Course	Credit (ECTS)						2
	No	Program Outcom	nes	1	2 3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes		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.			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 co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x			
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation rely.				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.				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.			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.		x		
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM-208 Design Culture							
Course Semester	4							
Catalog Content	Introduction and basic concepts, Historical background, Design and production, Designers and design discourse, The consumption of design, High design, Consumer goods, Studying design culture.							
Textbook	1. Barnard, M, Sanat, Tasarım ve Görsel Kültür, Ütopya Yay. 2. Julier, G., The Culture of Design, SAGE Pub, 2013.							
Supplementary Textbooks	Sanat ve Tasarım Dergisi, Gazi Üniversitesi 2. Int. Journal of Design Engineering							
Credit	2 AKTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	Information about design history, presentation of designers, design process, consumption culture and design relationship, definition of good design							
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of design culture.</li> <li>They can make designs based on artistics and aesthetics concern.</li> </ol>							
Instruction Methods	Face to face							

	1. Week	Introduction and basic concepts							
	2. Week	Historical background 3	production						
	3. Week	Design and production							
	4. Week	Designers and design dis	scourse						
	5. Week	The consumption of des	ign						
	6. Week	5. High design Week							
Weekly Schedule	7. Week	Consumer goods							
() condy senedule	8. Week	Relationship between cu	lture and des	sign					
	9. Week	Communications, manag	gement and p	articipation					
	10. Week	Networks and mobile teo	chnologies						
	11. Week	Presentations							
	12. Week	Presentations							
	13. Week	Presentations							
	14. Week	Presentations							
	Weekly th	eoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which activities you use in the course)	Reading A	activities: 0							
activities you use in the course)	Internet bi materials:	owsing, library work Desigr 7	ing and imple	ementing					
	Report pre	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 5							
	Preparatio	n of Midterm and Midterm I	Exam: 5						
	Final Exa	n and Preparation for Final I	Exam: 5						
			Numbers	Total Weightin g (%)					
	Midterm	30							
	Assignm Applicat	30							
Assassment Criteria	Projects								
Assessment Unterna	Practice	Practice							
	Quiz Percent o (%)	of In-term Studies	1	60					
	Percenta	ge of Final Exam to Total	1	40					
	l								

	Score (%)		
	Attendance		
			<b>_</b>

		Activity	TotalDurationNumber(weeklyof Weekshour)			Total Period Work Load		
	Weekly	y Theoretical Course	14	2				28
	Weekly	y Tutorial Hours						
	Readin	g Tasks						
	Studies							
	Material Design and		7	1				7
Workload		Preparing		-				
		ing a Presentation						
	Presen	tations	5	1				5
	Midter Prepera Midter	m Exam and ation for m Exam	1	5				5
	Final E	Exam and	1	5				5
	Other (	ation for Final Exam						
	be emp	bhasized)						
	Total V	Vorkload						50
	Total V	Workload / 25						50/25
	Course	Credit (ECTS)						2
	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 p to the relevant discipl ability to use theoretic applied information in areas to model and so engineering problems			X			
	2	Ability to identify, for and solve complex er problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this		х			
		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.				X		1
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and nes and nalysis and problems cations; ation rely.			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.			х		
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.	Х	£		
The Course's Lecturer(s) and Contact Informations	Departi tas	nent Management arim@gazi.edu.tr				

	Course Description Form
Course Code and Name	ETM 211 - Material Science
Course Semester	3
Catalog Content	Classification of materials. Atomic bonds. Cage systems, atomic structures. Aging. Material testing methods: Tensile testing, impact testing, bending, torsion, fatigue, hardness measurement tests. Alloys, phase, component definitions. Phase law, quenching graphics. Ferrit-Sementit phase diagrams. Isothermal transformation and continuous quenching diagrams. Heat treatments of steels, steel standards. Role of alloy elements stainless steels, high speed steels, tool steels, non-metallic materials. Corrosion and protection methods from corrosion.
Textbook	<ol> <li>Savaşkan, T., Malzeme Bilgisi ve Muayenesi Eğitim Bilimine Giriş, Derya Yay., Trabzon, 2001.</li> <li>Uzun, H., Fındık, F. ve Salman, S., Malzeme Biliminin Temelleri, Değişim Yay., İstanbul, 2003.</li> </ol>
Supplementary Textbooks	Callister, W.D., An Introduction to Materials Science and Engineering, John Wiley & Sons, 2003.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	Teaching topics and rules of material science, gaining capabilities for its applications.
Course Learning Outcomes	<ul> <li>Students who attend this course learn basis of material science.</li> <li>They can use the knowledge of this course while solving design problems.</li> </ul>
Instruction Methods	Expression

	1. Week	Classification of materials.								
	2. Week	Atomic bonds. Cage system	ns atomic strue	ctures						
	3. Week	Crystal systems								
	4. Week	Aging								
	5. Week	5. Material testing methods Week								
	6. Week	Tensile testing, impact test hardness measurement tests	ensile testing, impact testing, bending, torsion, fatigue, ardness measurement tests							
Waakhy Sabadula	7. Alloys, phase, component definitions									
weekly Schedule	8. Week	Phase law, quenching grap	hics, Ferrit-Se	mentit phase o	liagrams					
	9. Week	Isothermal transformation a	and continuou	s quenching d	iagrams					
	10. Week	Heat treatments of steels, s	teel standards,	, role of alloy	elements					
	11. Week	Stainless steels, high speed	steels, tool st	eels						
	12. Week	Non-metallic materials								
	13. Week	Corrosion types								
	14. Week	Protection methods from co	orrosion							
	Weekly th	eoretical course hours: 3								
Teaching and Learning Methods	Weekly tu	torial hours: 0								
(These are examples. Please fill which	Reading A	activities: 12								
activities you use in the course)	Internet bi materials:	rowsing, library work Design 24	ning and imple	ementing						
	Report pre	eparing: 0								
	Preparing	a Presentation: 0								
	Presentati	ons: 0								
	Preparatio	n of Midterm and Midterm I	Exam: 3							
	Final Exa	n and Preparation for Final I	Exam: 3							
			Numbers	Total Weightin g (%)						
	Midterm	Exams	1	40	1					
	Assignm Applicat	ion	1	20						
	Projects				1					
Assessment Criteria	Practice									
	Quiz									
	Percent of (%)	of In-term Studies		60						
	Percenta Score (%	ge of Final Exam to Total	1	40						

Attendance	
	<u>.</u>
-	

	Activity				Total Duration Number (weekly f Weeks hour)			
	Weekl	y Theoretical Course	11	3		33		
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes		y Tutorial Hours						
		ng Tasks	6	2		12		
	Studie	s	8	3		24		
	Materi	al Design and						
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	1	3		3		
	Final H	Exam and	1	3		3		
	Preper Other	ation for Final Exam						
	be emp	phasized)						
	Total V	Workload	-	-		75		
	Total V	Workload / 25				75/25		
	Course	Program Outcom				3		
Contribution Level Between Course Learning Outcomes and Program Outcomes	No 1 2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information is areas to model and se engineering problem Ability to identify, fo and solve complex eight	in these olive in these olve s.		4 5 x x x			
		problems; ability to s apply proper analysis modeling methods fo purpose.	select and s and or this					
		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.						
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation ely.	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.		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.		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.		x		
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 212 – ENGINEERING MATERIALS							
Course Semester	4							
Catalog Content	Classification of engineering materials. Iron and steel production. Steel, cast iron types and usage areas. Heat treatment of metals and alloys. Non-ferrous metals and their use. Types, properties and manufacturing methods of ceramic, polymer and composite materials. Damage to materials. Selection of materials in engineering design.							
Textbook	<ul><li>A. S.Wadhwa, E. H.S. Dhaliwal, A Textbook of Engineering Material and Metallurgy, Firewall Media, 2008.</li><li>R.K. Rajput, Engineering Material, 2008</li></ul>							
Supplementary Textbooks	W. Callister, Material science and engineering.							
Credit	3 AKTS							
<b>Prerequisites of the Course</b> ( <i>Attendance Requirements</i> )	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	To introduce the basic properties of engineering materials and the material properties of the atomic size, to introduce relations between physical, metallurgical and mechanical properties in materials, test methods and material to be obtained to understand the meaning of the data, to understand the basic principles regarding the selection of materials							
Course Learning Outcomes	<ol> <li>Students who attend this course learn of physical and mechanical properties of materials, heat treatment, phase diagrams and so on.</li> <li>They can work better and more appropriate material while designing.</li> </ol>							
Instruction Methods	Face to face							

	1. Week	Introduction							
	2. Woole	Properties of metals and all	oys.						
	wеек 3.	Fe-Fe3C phase diagram, irc	on and steel p	roduction					
	Week								
	4. Week	Effect of alloying elements	on properties	of steels					
	5. Week	Heat treatment of metals an	d alloys						
	6. Week	Heat treatment of metals an	d alloys						
	7. Week	Types and use of steels and cast irons. Designations of steels and cast irons.							
Weekly Schedule	8. Week	Non-ferrous metals and allo	oys.						
	9. Week	Ceramic materials. Processi	ing and applic	cations of ceramics	5				
	10. Week	Polymers. Types of polyme of polymers	rs. Processing	g and applications					
	11. Week	Composite materials and th	eir manufactu	ring methods					
	12. Week	Failure of materials. Source	s and prevent	tion of failures in					
	13. Week	Failure of materials. Source materials	es and prevent	tion of failures in					
	14. Week	Case studies in materials selection							
	Weekly theoretical course hours: 2								
Teaching and Learning Matheda	Weekly tu	torial hours: 1							
(These are examples. Please fill which	Reading Activities: 0								
activities you use in the course)	Internet browsing, library work Designing and implementing materials: 23								
	Report pro	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm E	Exam: 3						
	Final Exa	m and Preparation for Final E	Exam: 4						
			Numbers	Total Weightin					
	Midterm	Exams	1	<b>g</b> (70) 40					
	Assignm	ient	2	10					
	Application 1 10								
Assessment Criteria	Projects Practice								
	Quiz								
	Percent (%)	60							
	Percenta Score (%	ge of Final Exam to Total 6)		40					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Du (we hou	ratio eekly ur)	<b>)n</b> 7		Total Period Work Load
	Weekly Hours	y Theoretical Course	14		2	,		28
	Weekl	y Tutorial Hours	14		1			14
	Readin	ıg Tasks						
	Studies		2		4			8
	Materi	al Design and	5		3			15
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	1		5			5
	Final B	Exam and ation for Final Exam	1		5			5
	Other (	( should						
	be emp	bhasized)						
	Total V	Workload	-		-			/5
	Course	Credit (ECTS)						3
	Course	Program Outcom	nes				_	5
Contribution Level Between Course Learning Outcomes and Program Outcomes	1 2	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 3	x x	5	
		and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ngineering select and s and or this					
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the / to apply ods for this				x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and hes and nalysis and problems cations; ation rely.				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.		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.			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.		X	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

Course Description Form								
Course Code and Name	ETM 213 – MANUFACTURING TECHNOLOGIES - I							
Course Semester	3							
Catalog Content	Mechanical and physical properties of materials, metal casting, mechanical deformation processes (bulk and sheet forming), machining and joining operations, powder metallurgy, nontraditional processes, micro and nano fabrication technologies. Machine tools and metal cutting operations, metal cutting mechanics, cutting temperatures, cutting tools: materials and geometry, tool wear and tool life, cutting fluids, economics of metal cutting operations, introduction to computer-aided manufacturing.							
Textbook	<ol> <li>Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed 1997.</li> <li>Boothroyd, G., Knight, W. A., Fundamentals of Machining and Machine Cutting, Mark Dekker Inc., 1989.</li> </ol>							
Supplementary Textbooks	<ol> <li>Kalpakjian, S., Schmid, S. R., "Manufacturing Engineering and Technology", Prentice Hall; 5th Ed., 2005</li> <li>DeGarmo, E. P., Black, J. T., "Materials and Processes in Manufacturing", John Wiley &amp; Sons, 10th Ed., 2007.</li> </ol>							
Credit	3 AKTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	Sand casting, molding sand, models and core preparation, molding technique, metal mold casting, casting defects, the melting means. Oxy acetylene welding, arc welding, submerged arc welding, arc welding, welding defects. Free forging and pressing, die forging and pressing, extrusion, rolling, wire drawing and machining procedures.							
Course Learning Outcomes	<ol> <li>Students taking this course learn manufacturing methods and technologies applied in machine manufacturing industry.</li> <li>Learns the casting methods and gains the ability to practice.</li> <li>Learns the welding methods and gains the ability to practice.</li> <li>Learns the mold and core making</li> <li>Learns the hand tools and usage of it in machining.</li> <li>Learns the basic operations of machining. Learns longitudinal, graded, taper turning operations.</li> <li>Learns turning method and cutting tools used in machining.</li> <li>Learns hole drilling and hole enlarging.</li> <li>Learns how to apply screw and reaming operations on drilled holes.</li> <li>Understanding philosophy behind environment, safety, research and ethics</li> </ol>							
Instruction Methods	Face to face Practical training							

	1. Week	Introduction and basic aspo	ects							
	2. Week	Casting: Pattern and core n	naking							
	3. Week	Casting: Implementation m	ethods							
	4. Week	Applications								
	5. Week	Welding and Implementati	on methods							
	6. Week	Applications								
Weekly Schedule	7. Week	Mold and core making								
	8. Week	Machining: Basic operation	ns and practica	al works						
	9. Week	Machining: General tools a	and their use							
	10. Week	Machining: Turning, borin	g and related p	processes						
	11. Week	Applications								
	12. Week	Machining: Drilling and re	lated hole-mal	king processes						
	13. Week	Applications								
	14. Week	Manufacturing a simple sy- learned in this course	stem by using	the methods						
	Weekly theoretical course hours: 2									
Teaching and Learning Methods	Weekly tutorial hours: 1									
(These are examples, Please fill which	Reading A	Activities: 0								
activities you use in the course)	Internet b	rowsing, library work Design	ning and imple	ementing						
	materials:	5								
	Report pr	eparing: 0								
	Preparing	a Presentation: 0								
	Presentati	ons: U								
	Preparatio	on of Midterm and Midterm	Exam: 4							
	Final Exa	m and Preparation for Final	Exam: 4							
			Numbers	Total Weightin g (%)						
	Midterm	n Exams	1	40						
	Assignm	nent								
	Application 1 20									
Assessment Criteria	Projects Practice									
	Quiz									
	Percent (%)	60								
	Percenta Score (%	age of Final Exam to Total 6)		40						
	Attendar	nce								

		Activity	Total Number of Weeks	Dur (wee hou	ation ekly r)		Total Period Work Load
	Weekly Theoretical Course Hours		14		2		28
	Weekly Tutorial Hours		14		1		14
	Readin	ig Tasks					
	Studies		2		5		10
	Materi Implen	al Design and nentation	3	5			15
	Report	Preparing					
Workload	Prepar	ing a Presentation					
	Presen	tations					
	Midter Prepera Midter	m Exam and ation for m Exam	1		4		4
	Final E Prepera	Exam and ation for Final Exam	1		4		4
		(should					
	Total V	Workload	-		-		75
	Total V	Workload / 25					75/25
	Course	credit (ECTS)					3
	No	Program Outcom	nes	1 2	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.				x		
	2	Ability to identify, fo and solve complex en problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this		X		
	3	Ability to design a co system, process, devi product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or it itions, in et the v to apply ods for this			x	
	4	Ability to develop, so use modern techniqu tools necessary for an solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation ely.			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.		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.			х		
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.		X	
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 214 - Manufacturing Technologies - II						
Course Semester	4						
Catalog Content	Introduction, history of manufacturing engineering, manufacturing engineering education, design and manufacturing, manufacturing engineering and product life cycle, manufacturing processes and technology, case studies in manufacturing engineering, research topics and development trends in manufacturing.						
Textbook	<ol> <li>Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed., 1997.</li> <li>Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed 1997.</li> </ol>						
Supplementary Textbooks	Üretim Yöntemleri ve İmalat Teknolojileri (Prof. Dr. Muammer Gavas, Prof. Dr. Mustafa Yaşar, Doç. Dr. Mustafa Aydın, Doç. Dr. Yahya Altunpak)						
Credit	3 ECTS						
<b>Prerequisites of the Course</b> ( <i>Attendance Requirements</i> )	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Obligatory						
Instruction Language	Turkish						
Course Objectives	Machining Methods of Machining, Modern Manufacturing Methods, High Velocity Shaping of Metals are evaluated in terms of a designer engineer and training in these subjects						
Course Learning Outcomes	<ol> <li>Learns concepts and systems related to manufacturing technology.</li> <li>Learns the recognize the milling method, tool and apparatus.</li> <li>Learns milling methods such as plane surface, inclined surface, grooving, step milling, division operations etc.</li> <li>Learns turning methods such as plane surface, inclined surface, grooving, step milling, division operations etc</li> <li>Learns the broaching, sawing, rasping, shaping and planing.</li> <li>Learns the basic operations of machining. Learns longitudinal, graded, taper turning operations.</li> <li>Learns turning method and cutting tools used in machining.</li> <li>Learns hole drilling and hole enlarging.</li> <li>Applies cutting, rasping, shaping and planing processes.</li> <li>Understanding philosophy behind environment, safety, research and ethics</li> <li>Learns the powder metallurgy and the sintering processes.</li> </ol>						
Instruction Methods	Expression						

Veck       Machining: Milling         Week       Machining: Milling Applications         Week       Machining: Turning         Week       Machining: Turning         Week       Machining: Turning Applications         Week       Machining: Applications         S.       Machining: Applications         Week       Machining: Applications         Week       Machining: Applications         Week       Machining: Applications         Week       Machining: Boring and related processes applications         Week       Machining: Basic operations and practical works         Week       Machining: General tools and their use         Week       Machining: Drilling and related hole-making processes         Week       Introduction and general principles         Week       Introduction and general principles         Week       Introduction and general principles         Weekly taturial hours: 2       Weekly taturial hours: 2         Weekly taturial hours: 0       Preparing: 0         Preparing: 0       Preparing: 0         Preparing: 0       Preparing: 0         Preparing: 0       Preparing: 0         Preparing: 1       10         Assignment       1         Assignment		1.         Introduction and general principles								
Week       Machining: Milling Applications         Week       Machining: Turning         Veek       Machining: Turning Applications         Week       Machining: Applications         Week       Machining: Applications         Week       Machining: Applications         Week       Machining: Aprisve processes applications         Week       Machining: Boring and related processes applications         Week       Machining: Basic operations and practical works         Week       Machining: General tools and their use         Week       Machining: Drilling and related hole-making processes         Week       Machining: Drilling and related hole-making processes         Week       Machining: Drilling and related hole-making processes         Week       Introduction and general principles         Week       Introduction and general principles         Weekly totorial hours: 2       Weekly totorial hours: 2         Weekly totorial hours: 0       Preparing a Presentation: 0         Preparing a Presentation: 0       Preparing a Presentation: 0         Preparing a Presentation: 0       Preparing a Presentation: 0         Preparing a Presentation: 0       Preparing a Presentation: 0         Preperitie       1       10         Assegment       1		2. Week	Machining: Milling							
Veck       Machining: Turning         S.       Machining: Turning Applications         Week       Machining: Abrasive processes (grinding, honing, lapping)         Week       Machining: Abrasive processes applications         Week       Machining: Boring and related processes applications         Week       Machining: Boring and related processes applications         Week       Machining: Boring and related processes applications         Week       Machining: Basic operations and practical works         Week       Machining: Diriling and related hole-making processes         10.       Machining: Diriling and related hole-making processes         12.       Manufacturing a simple system by using the methods         13.       System design and manufacturing of it.         Week       Introduction and general principles         Week       Weekly theoretical course hours: 2         Weekly theoretical course hours: 2       Weekly turvirial hours: 2         Reading Activities: 8       Internet browsing, library work. Designing and implementing materials: 15         Report preparing: 0       Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation: 0       Presentations: 0         Preparation of Midterm Exams       1       40         Assessment Criteria       1       1 <t< th=""><th></th><th>3. Week</th><th colspan="7">Machining: Milling Applications</th></t<>		3. Week	Machining: Milling Applications							
Sec         Machining: Turning Applications           Week         Machining: Abrasive processes (grinding, honing, lapping)           Yeek         Machining: Abrasive processes applications           Week         Machining: Boring and related processes applications           Yeek         Machining: General tools and their use           Week         Nachining: General tools and their use           Week         Nachining: Drilling and related hole-making processes           10.         Machining: Drilling and related hole-making processes           Week         11.           Machining: Brilling and related hole-making processes           Week         13.           System design and manufacturing of it.           Week         14.           Introduction and general principles           Weekly tutorial hours: 2           Weekly tutorial hours: 2           Weekly tutorial hours: 2           Reading Activities: 8           Internet browsing, library work Designing and implementing marials:15           Report preparing: 0           Preparation of Midterm and Midterm Exam: 6           Final Exam and Preparation for Final Exam: 6           Final Exam and Preparation for Final Exam: 6           Midterm Exams         1           Application         100      <		4. Week	I. Machining: Turning Week							
Weekly Schedule       Image: Schedule Schedu		5. Week	Machining: Turning A	pplications						
Week         Machining: Abrasive processes applications           Week         Machining: Boring and related processes applications           Week         Machining: Boring and related processes applications           Week         Machining: Boring and related processes applications           Week         Machining: Ceneral tools and their use           Week         Machining: Drilling and related hole-making processes           Week         Manufacturing a simple system by using the methods           I1.         Machining: Drilling and related hole-making processes           Week         System design and manufacturing of it.           Week         Week           I2.         Manufacturing a simple system by using the methods           Week         Issue ourse           Week         Week           Week         Week           Week         Week           Week         Week           Week         Week           Week         Week           Week         Reading Activities: 2           Week         Week           Week         Reading Activities: 8           Internet browsing, library work Designing and implementing materials: 15           Report preparing: 0         Preparation of Midterm Exam: 6           Final Ex		6.	Machining: Abrasive	processes (grii	nding, honing,	lapping)				
Weekly Schedule       Intel Machining: Boring and related processes applications         Week       Machining: Boring and related processes applications         Week       Machining: General tools and their use         Week       Machining: Orilling and related hole-making processes         Week       Machining: Drilling and related hole-making processes         Week       Machining: Drilling and related hole-making processes         Week       Manufacturing a simple system by using the methods         Week       I.         Machining: Drilling and related hole-making processes         Week       I.         Manufacturing a simple system by using the methods         Week       I.         Machining: Drilling and related hole-making processes         Weekly theoretical course iourse       Weekly         It.       System design and manufacturing of it.         Weekly tuboretical course hours: 2       Weekly tuboretical course hours: 2         Weekly tuboretical course hours: 2       Reading Activities: 8         Internet browsing, library work Designing and implementing materials: 15       Report preparing: 0         Preparing a Presentation: 0       Preparation of Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6       Introduction in 1 40         Assignment       1 0		Week     7.     Week	Machining: Abrasive	processes appl	lications					
Veek         Machining: Basic operations and practical works           9.         Machining: General tools and their use           Week         Machining: General tools and their use           Week         In           Machining: Drilling and related hole-making processes           Week         Lamba their use           11.         Machining: Drilling and related hole-making processes           Week         Learned in this course           13.         System design and manufacturing of it.           Week         Learned in this course           13.         System design and manufacturing of it.           Week         Introduction and general principles           Weekly theoretical course hours: 2         Weekly tutorial hours: 2           (These are examples. Please fill which activities: 8         Reading Activities: 8           Internet browsing, library work Designing and implementing materials: 15         Report preparing: 0           Preparing a Presentation: 0         Presentations: 0           Preparation of Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6           Midterm Exams         1         40           Assignment         1         10           Application         Projects         1           Projects         1         10 </th <th>Weekly Schedule</th> <th colspan="8">8. Machining: Boring and related processes applications</th>	Weekly Schedule	8. Machining: Boring and related processes applications								
Internet       Machining: General tools and their use         Week       II.         Machining: Drilling and related hole-making processes         I2.       Manufacturing a simple system by using the methods         learned in this course       II.         Week       II.         Manufacturing a simple system by using the methods         learned in this course       II.         I3.       System design and manufacturing of it.         Week       II.         I4.       Introduction and general principles         Week       II.         I4.       Introduction and general principles         Week       Weekly theoretical course hours: 2         Weekly tutorial hours: 2       Reading Activities: 8         activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials:15       Report preparing: 0         Preparation of Midterm and Midterm Exam: 6       Final Exam and Preparation for Final Exam: 6         Final Exam and Preparation for Final Exam: 6       Midterm Exams: 1         Midterm Exams       1       40         Assignment       1       10         Application       Projects       1         Projects       1       10		9. Machining: Basic operations and practical works								
Veck       Machining: Drilling and related hole-making processes         11.       Machining: Drilling and related hole-making processes         12.       Manufacturing a simple system by using the methods         learned in this course       13.         System design and manufacturing of it.       14.         Week       Introduction and general principles         Veek       Week         Teaching and Learning Methods       Reading Activities: 8         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials: 15       Report preparing: 0         Preparation of Midterm Exam: 6       Final Exam and Preparation for Final Exam: 6         Final Exam and Preparation for Final Exam: 6       Independent of the projects         Midterm Exams       1       40         Assessment Criteria       Implement of Interm Studies       Implement of Interm Studies         Projects       1       10         Practice       Implement of Interm Studies       60         Percentage of Final Exam to Total       1       40		10.	Machining: General to	ools and their	use					
Interview       Manufacturing a simple system by using the methods learned in this course         13.       System design and manufacturing of it.         Week       14.         Introduction and general principles         Week       Weekly theoretical course hours: 2         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials:15       Report preparing: 0         Preparing a Presentation: 0       Preparation of Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6       Total Weightin g (%)         Midterm Exams       1       40         Assessment Criteria       Image final Exam to Total Projects       1         Precent of In-term Studies (%)       60       60         Percent of Final Exam to Total Score (%)       1       40		Week	Machining: Drilling an	nd related hole	e-making proc	esses				
13. Week       System design and manufacturing of it.         14. Week       Introduction and general principles         Veekly theoretical course hours: 2         Weekly theoretical course hours: 2         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials: 15       Report preparing: 0         Preparing a Presentation: 0       Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6       Total Weightin g(%)         Midterm Exams       1       40         Assessment Criteria       Midterm Exams       1       10         Projects       1       10       Pratice         Projects       1       10       10         Practice       1       10       10         Practice       1       10       10         Practice       1       10       10         Projects       1       10       10         Projects       1       10       10         Projects       1       10       10         Precentage of Final Exam to Total       60       60		12. Week	Manufacturing a simp learned in this course	le system by u	using the metho	ods				
14. Week       Introduction and general principles         Teaching and Learning Methods       Weekly theoretical course hours: 2         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials:15       Report preparing: 0         Preparation of Midterm and Midterm Exam: 6       Total         Veightin g (%)       Midterm Exams       1       40         Assessment Criteria       1       40       10         Projects       1       10       Present of In-term Studies       60         Percentage of Final Exam to Total Score (%)       Mode       60		13. Week	System design and ma	nufacturing of	f it.					
Teaching and Learning Methods       Weekly theoretical course hours: 2         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials: 15       Report preparing: 0         Preparing a Presentation: 0       Presentations: 0         Preparation of Midterm and Midterm Exam: 6       Final Exam and Preparation for Final Exam: 6         Assessment Criteria       Inditerm Exams       1       40         Assessment Criteria       Percent of In-term Studies       60         Percentage of Final Exam to Total       1       40		14.     Introduction and general principles       Week     Veck								
Teaching and Learning Methods       Weekly tutorial hours: 2         (These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials:15       Report preparing: 0         Preparing a Presentation: 0       Presentations: 0         Preparation of Midterm and Midterm Exam: 6       Final Exam and Preparation for Final Exam: 6         Kindlerm Exams       1       40         Assessment Criteria       Midterm Exams       1         Projects       1       10         Projects       1       10         Present of In-term Studies       60         Percent of Final Exam to Total Score (%)       1		Weekly th	neoretical course hours: 2							
(These are examples. Please fill which activities you use in the course)       Reading Activities: 8         Internet browsing, library work Designing and implementing materials:15       Report preparing: 0         Preparing a Presentation: 0       Preparation of Midterm Additional Midterm Exam: 6         Preparation of Midterm and Midterm Exam: 6       Final Exam and Preparation for Final Exam: 6         Midterm Exams       1       40         Assessment Criteria       Midterm Exams       1       10         Projects       1       10         Precent of In-term Studies       60       Percentage of Final Exam to Total       60	Teaching and Learning Methods	Weekly tu	itorial hours: 2							
activities you use in the course)       Internet browsing, library work Designing and implementing materials:15         Report preparing: 0       Preparing a Presentation: 0         Presentations: 0       Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6         Final Exams       1         Assessment Criteria       Midterm Exams         Projects       1         Projects       1         Projects       1         Precent of In-term Studies       60         Percentage of Final Exam to Total       1         Accert (%)       1	(These are examples. Please fill which	Reading A	Activities: 8							
Assessment Criteria       Report preparing: 0         Preparing a Presentation: 0         Preparing a Presentation: 0         Presentations: 0         Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6         Midterm Exams       1         Midterm Exams       1         40       Assignment         1       10         Projects       1         Projects       1         Precent of In-term Studies       60         (%)       For al Exam to Total         Percentage of Final Exam to Total       1         40       1	activities you use in the course)	Internet bi materials:	rowsing, library work Desigr 15	ning and imple	ementing					
Assessment Criteria Preparation Midterm Exams I 40 Preparation of Midterm and Midterm Exam: 6 Final Exam and Preparation for Final Exam: 6 Final Exam and Preparation for Final Exam: 6 Midterm Exams I 40 Assignment I 10 Application Projects I 10 Practice Quiz Percent of In-term Studies (%) Percentage of Final Exam to Total I 40 Score (%)		Report pro	eparing: 0							
Assessment Criteria       Presentations: 0         Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6         Midterm Exams       Total         Weightin g (%)         Midterm Exams       1         Assignment       1         1       10         Application       -         Projects       1       10         Practice       -       -         Quiz       -       -         Percent of In-term Studies (%)       60       -         Percentage of Final Exam to Total Score (%)       1       40		Preparing	a Presentation: 0							
Mathematical Systems       Preparation of Midterm and Midterm Exam: 6         Final Exam and Preparation for Final Exam: 6         Numbers       Total Weightin g (%)         Midterm Exams       1       40         Assignment       1       10         Application       -       -         Projects       1       10         Practice       -       -         Quiz       -       -         Percent of In-term Studies       60         (%)       -       60         Percentage of Final Exam to Total       1       40		Presentati	ons: 0							
Final Exam and Preparation for Final Exam: 6NumbersTotal Weightin g (%)Midterm Exams140Assignment110Application-Projects110PracticeQuizPercent of In-term Studies (%)60Percentage of Final Exam to Total Score (%)140		Preparatio	on of Midterm and Midterm I	Exam: 6						
NumbersTotal Weightin g(%)Midterm Exams140Assignment110Application-Projects110Practice-Quiz-Percent of In-term Studies (%)60Percentage of Final Exam to Total Score (%)1		Final Exa	m and Preparation for Final I	Exam: 6						
Assessment CriteriaMidterm Exams140Assignment110Application-Projects110Practice-Quiz-Percent of In-term Studies (%)60Percentage of Final Exam to Total Score (%)1				Numbers	Total Weightin					
Assignment Criteria110Assessment CriteriaProjects110Projects110Practice		Midterm	n Exams	1	<b>g</b> (7 <b>0</b> ) 40					
Assessment Criteria       Projects       1       10         Practice		Assignm	10							
Assessment Criteria     Practice       Quiz		Projects		1	10					
Quiz60Percent of In-term Studies (%)60Percentage of Final Exam to Total Score (%)1	Assessment Criteria Practice Quiz									
Percent of In-term Studies60(%)Percentage of Final Exam to Total1Score (%)140										
Percentage of Final Exam to Total 1 40		Percent (%)	of in-term Studies		60					
		Percenta Score (%	ge of Final Exam to Total %)	1	40					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Durat (week hour)	ion ly		Total Period Work Load
	Weekly Hours	y Theoretical Course	14		2		28
	Weekl	y Tutorial Hours	14		1		14
	Readin	ng Tasks	4		2		8
	Studie	5	5		3		15
		al Design and nentation					
		Preparing					
Workload	Prepar	ing a Presentation					
	Presen	tations					
	Midter Preper Midter	m Exam and ation for m Exam					
	Final E Preper	Exam and ation for Final Fxam	2		5		10
	Other (	(should				$\uparrow$	
	be emp	bhasized) Vorkload			_	+	75
	Total V	Workload / 25	-		-	+	75/25
	Course	credit (ECTS)				+	3
	NI-	Program Outcom	nes	1 2	2 1	5	-
Contribution Level Between Course Learning Outcomes and Program Outcomes	Level Between Course Learning 1 Adeque areas to the real ability applied areas to engine 2 Ability		e in pertaining pertaining pline; ical and in these olve s. prmulate, ngineering		x	<u> </u>	
		problems; ability to s apply proper analysis modeling methods fo purpose.	select and s and or this				
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.		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.			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.		x			
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.			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.		x		
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr				

Course Description Form						
Course Code and Name	ETM 215 – COMPUTER AIDED DESIGN-I					
Course Semester	3					
Catalog Content	Introduction to CAD, Creating simple parts and drawings, Solid modeling, Surface modeling, Model modeling, Using equations, Working with assemblies, Working with assemblies, Using assembly tools, Animation with motion manager, Creating detailed drawings, Creating complex assembly drawings Creating sheet metal part drawings, Using plastic tooling tools, Example of a general design					
Textbook	<ol> <li>Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013.</li> <li>Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008.</li> <li>Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007.</li> </ol>					
Supplementary Textbooks	Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim – Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012.					
Credit	3 AKTS					
<b>Prerequisites of the Course</b> ( <i>Attendance Requirements</i> )	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	To learn the basics of computer-aided design, students' sketch skills in addition to the ability to apply in the computer environment to develop design capabilities.					
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of advanced computer aided design.</li> <li>They can use better and more efficient computational tools while designing.</li> </ol>					
Instruction Methods	Face to face Practical training					

	1. Introduction to CAD									
	2.	Create simple parts and dra	wings							
	Week									
	3. Week	Solia modeling								
	4.	Surface modeling								
	Week									
	5. Week	S. Modeling with elements Week								
	6. Waab	Using equations, working v	with part form	ations						
	7.	Working with assemblies								
Weekly Schedule	Week	Line the mounting tools								
	o. Week	Using the mounting tools								
	9. Week	Animation with motion ma	nager							
	10.	Creating detailed drawings								
	wеек	Create complex assembly d	Irawings							
	Week	Create complex assembly c	nawings							
	12. Week	Creating sheet metal parts	drawings							
	13.	Using Plastic Mold Tools								
	Week	Veek								
	Week	Enample of a general desig	,							
	Weekly th	eoretical course hours: 2								
Teaching and Learning Methods	Waaldy tu	torial harmon 1								
Teaching and Learning Withous	weekiy tu	uorial nours: 1								
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0								
activities you use in the course)	Internet bi	rowsing, library work Desigr	ning and imple	ementing						
	materials:	40								
	Report pro	eparing: 0								
	Preparing	a Presentation: 0								
	Presentati	ons: ()								
	-									
	Preparatio	on of Midterm and Midterm l	Exam: 3							
	Final Exa	m and Preparation for Final I	Exam: 4		1					
			Numbers	Total Weightin						
	3.61.1.			g (%)	_					
	Midterm	ent	40							
	Application 2 10									
	Projects									
Assessment Criteria	Practice	ractice								
	Quiz									
	Percent	of In-term Studies		60						
	(%) Derecente	ap of Final Exam to Total		40	-					
	Score (%	()		40						

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Du (w ho	ırati eekl ur)	ion ly		Total Period Work Load
	Weekly Theoretical Course Hours		14			2		28
	Weekl	y Tutorial Hours	14			1		14
	Readin	ig Tasks						
	Studie	5	1			4		4
	Materi Impler	al Design and	4			5		20
	Report	Preparing						
Workload		ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	1			4		4
	Final E Preper	Exam and ation for Final Exam	1			5		5
	Other (	(should						
	be emp	onasized) Vorkload		-		_		75
	Total V	Workload / 25	-			-		3
	Course	credit (ECTS)		-				3
	No	Program Outcom	nes	1	2	3 4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	ng 1 Adequate knowledge in mathematics, science and engineering subjects perta to the relevant discipline; ability to use theoretical a applied information in the areas to model and solve engineering problems.		e in e and pertaining line; ical and in these olve s.			X		
	2	Ability to identify, fo and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this			X		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the y to apply ods for this				x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation ely.				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.		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.			х		
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.		X	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

Course Description Form								
Course Code and Name	ETM 216 - Modelmaking and Prototyping-I							
Course Semester	4							
Catalog Content	Introduction, Description of modelmaking and giving some examples, Prototyping interactive electronic products, 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>Shimizu, Y., Kojima, T., Tano, M., Matsuda, S., Models and Prototypes, Graphic Sha Pub Co; Shohan edition (1991)</li> </ol>							
Supplementary Textbooks	Shovic, J. C., Raspberry Pi IoT Projects, Prototyping Experiments for Makers, 1st ed. Edition.							
Credit	3 ECTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Obligatory							
Instruction Language	Turkish							
Course Objectives	To learn basic model and prototype development, to gain the ability to apply. To teach the techniques that may be needed in the process of 3D modelling and prototyping. Demonstrate realizing a design in the idea stage.							
Course Learning Outcomes	<ul> <li>Students who attend this course learn basis of model making and prototyping.</li> <li>They can develop simple and basic level models and prototypes.</li> </ul>							
Instruction Methods	Expression, practice.							

	1. Week	1. Introduction							
	2. Woole	Description of modelmakin	g and giving s	some example	S				
	week	TT							
	3. Week	How prototypes are used							
	4. Week	Prototyping interactive electronic products							
	<b>5</b> Madaluatina Drinci 1 1. 1. 1. 1. 1								
	5. Week	Modelmaking: Principles a	nd choices, he	alth and safer	y				
	6. Week	Modelmaking: Space and setup, workflow							
Waaldy Sahadula	7. Week	Tools used for modelmaking							
weekiy Schedule	8. Wook	Adhesives and fillers							
	9.	Papers and cartons, foamco	ore, polystyren	e foam					
	Week 10.	Thermoplastic sheet and ex	truded shapes	, polyurethane	e				
	Week	modelling board	*						
	11.	Wood							
	Week								
	12. Week	Modelling clay, casting							
	<u>weeк</u> 13.	Painting and 3D printing							
	Week								
	14. Week	4. Graphics: Labels and decals, softgoods: Sewn textile products Veek							
	Weekly th	eoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	torial hours: 3							
(These are examples. Please fill which	Reading A	ctivities: 0							
activities you use in the course)	Internet br	owsing, library work Design	ing and imple	menting					
	materials:	8							
	Report pre	eparing: 0							
	Preparing	a Presentation: 0							
	Presentatio	ons: 0							
	Preparatio	n of Midterm and Midterm I	Exam: 6						
	Final Exar	n and Preparation for Final H	Exam: 6						
			Numbers	Total					
				weightin g (%)					
	Midterm	Exams	1	40					
	Assignm	ent							
	Application 1 20								
Assessment Criteria	Projects Practice								
	Quiz	Quiz							
	Percent of	Percent of In-term Studies							
	(%)			00					
	Percenta Score (%	ge of Final Exam to Total	1	40					

Attendance	
	<u>.</u>
-	

	Activity		Total Number of Weeks	Duration (weekly hour)	Tot Peri Wor Load	al iod rk d
	Weekly Theoretical Course		14	2	28	3
	Weekl	y Tutorial Hours	14	1	14	1
		ng Tasks				
	Studie	S	2	4	8	
	Materi	al Design and				
	Report	Preparing				-
Workload	Prepar	ing a Presentation	5	2	10	)
	Presen	tations				
	Midter Preper Midter	m Exam and ation for m Exam	2	3	6	
	Final F	Exam and	3	3	9	
	Other (	ation for Final Exam				
	be emp	ohasized)				
	Total V	Workload	-	-	75	;
	Total V	Workload / 25			75/2	25
	Course	Program Outcom	205		3	
	No		les	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.			X		
	2	Ability to identify, fo and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this	x		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this	x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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			1
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.		x	
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 218 - Basic Electricity and Electronics						
Course Semester	4						
Catalog Content	Electric current, voltage, resistance, capacitance, inductance, conductance-insulation, direct and alternating current. Switches, fuses, inductors, relays, contactors, transformers, electric motors, cables, semiconductors, solenoid valves, automatic circuit breakers. Ohm's Law, Kirchhoff's law, magnetic, chemical, heat and light effects of electrical current. Series and parallel circuits and properties. Direct and alternating current features and circuits. Digital and analogue electrical measuring instruments, direct and alternating current circuits, current and voltage measurements. Direct current and alternating current (single phase and three phase) electric motors, motor connections and control panel connections. Electricity use will be considered in the safety rules.						
Textbook	<ol> <li>Çelebi H.H., Elektrik Bilgisi, Yüce Yayınları, İstanbul, 1999.</li> <li>Özkan T., Temel Elektronik, Kayhan Matbaası, İstanbul, 1995</li> </ol>						
Supplementary Textbooks	Elektronik Devre Elemanları Elektronik Devreler, Yrd. Doç. Dr. Hüseyin Demirel, 2012.						
Credit	2 ECTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Obligatory						
Instruction Language	Turkish						
Course Objectives	This course provides basic knowledge about electricity and electronics.						
Course Learning Outcomes	The students who take this course, have basic electricity-electronic knowledge.						
Instruction Methods	Expression						

	<b>1.</b> Electric current, voltage, resistance, capacitance, inductance								
	2. Week	Conductance-insulation, di	rect and altern	ating current					
	3. Week	Switches, fuses, inductors,	relays, contac	tors, transform	iers				
	4. Week	Electric motors, cables, semiconductors							
	5. Week	Solenoid valves, automatic circuit breaker							
	6. Week	Ohm's Law							
	7.	Kirchhoff's law							
	Week 8.	Magnetic, chemical, heat and light effects of electrical current							
Weekly Schedule	Week		1.1.						
	9. Week	Series and parallel circuits	and their prop	berties					
	10. Week	Direct and alternating curre	ent features an	d circuits					
	11. Week	Digital and analogue electrical measuring instruments, direct and alternating current circuits, current and voltage							
	12. Week	Direct current and alternating current (single and three phases) electric motors, motor connections and control panel connections							
	13. Week	3. Direct current and alternating current (single and three phases) electric motors, motor connections and control panel							
	14. Week	14.       Electricity use will be considered in the safety rules         Week       Image: State of the safety rules							
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	ttorial hours: 2							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0							
activities you use in the course)	Internet bi materials:	rowsing, library work Desigr 8	ing and imple	ementing					
	Report pro	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm I	Exam: 4						
	Final Exa	m and Preparation for Final I	Exam: 4	Tatal					
	Numbers     Total       Weightin     σ (%)								
	Midterm	n Exams	1	40					
	Assignm Applicat	tion	1	20					
Assessment Criteria	Projects								
	Practice								
	Percent	of In-term Studies							
	(%)	60							

Percentage of Final Exam to Total Score (%)	1	40
Attendance		

	Activity		Total Number of Weeks	Du (we hou	ratio eekly ur)	on ,		Total Period Work Load
	Weekl	y Theoretical Course	14		2			28
	Weekl	y Tutorial Hours						
		ng Tasks						
	Studie	S	2	4			8	
	Materi	al Design and						
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	2	2				4
	Final H	Exam and	2		5			10
	Other	should						
	be emp	ohasized)						
	Total V	Workload	-		-			50
	Total V	Workload / 25						50/25
	Course	Program Outcom	205					Z
Contribution Level Between Course Learning Outcomes and Program Outcomes	No       Hogram 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					4 x x	5	
		Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose. Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic	omplex ice or ic itions, in et the v to apply ods for this elect and es and nalysis and problems ations:		x		x	
		ability to use informatechnologies effectiv	ation 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.				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.				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.				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.		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		
	15	Knowledge about awareness of the legal consequences of engineering solutions.		x		
--	----------------	---	--	---	--	--
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr				

Course Description Form								
Course Code and Name	ETM 205 Product Design-II							
Course Semester	4							
Catalog Content	In this course, students use the basic engineering concepts to recognize the elements used in mechanical design. They learn the concepts of forming parts according to production methods.							
Textbook	<ol> <li>Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara</li> <li>Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi.</li> </ol>							
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi							
Credit	4 AKTS							
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements							
Type of the Course	Compulsory							
Instruction Language	Turkish							
Course Objectives	<ol> <li>To teach different machine drawings according to Turkish standards and World standards</li> <li>Teaching machine science elements and their analysis.</li> <li>To teach Industrial Design Engineers' common problems and practical approaches they need to know during project design.</li> </ol>							
Course Learning Outcomes	<ol> <li>To be able to define the design problem</li> <li>To be able to evaluate and develop design</li> <li>To be able to design simple apparatus, mechanisms and machines</li> <li>To be able to select materials by considering design and functional properties</li> <li>To be able to design details by considering production method</li> <li>To be able to make changes in design by evaluating in terms of bearing, sealing and corrosion.</li> </ol>							
Instruction Methods	Face to face Practical training							

	1. Week	Introduction, basic concepts									
	2. Week	Define and analyze the desig	gn problem								
	3. Week	Design evaluation and devel	opment								
	4. Week	Design of shaft-hub and wed	lge connectio	ons							
	5. Week	Use of Splined Shafts, Pins a	and Pernos ir	n design							
	6. Week	Description of bearings, general features and numbering									
	7. Week	The use of bearing bearings	and bearing j	principles							
Weekly Schedule	8. Week	8. Inspection of sealing elements Week									
	9. Week	Principles of lubrication of s used	systems and the	he elements							
	10. Week	Design principles in terms of	f material rer	noval process							
	,, cen	material removal									
	11	Design principles of casting	narts								
	Week	Design principles of easing	parts								
	12. Week										
	13. Week	13. Design applications Week									
	14. Week	Design applications									
	Weekly th	eoretical course hours: 2									
Teaching and Learning Methods	Weekly tu	torial hours: 2									
(These are examples. Please fill which activities you use in the course)	Reading A	activities: 0									
activities you use in the course)	Internet bi materials:	owsing, library work Designi 10	ng and imple	menting							
	Report pre	eparing: 15									
	Preparing	a Presentation: 0									
	Presentati	ons: 0									
	Preparatio	n of Midterm and Midterm Ez	xam: 3								
	Final Exa	n and Preparation for Final E	xam: 4								
			Numbers	Total Weightin g (%)							
	Midterm	Exams	1	30							
	Assignm Applicat	ent									
A successful Criteria	Projects		5	30							
Assessment Uriteria	Practice										
	Quiz										

Percent of In-term Studies	60
Percentage of Final Exam to Total	40
Attendance	
	I

		Activity	Total Number of Weeks	Dur (we hou	ration ekly ır)		Total Period Work Load
	Weekl	y Theoretical Course	14		2		28
	Weekl	y Tutorial Hours	14		2		28
	Readir	ng Tasks					
	Studie	s	2		2		4
	Materi	al Design and	2		2		4
	Report	t Preparing	2		2		4
Workload	Prepar	ing a Presentation					
	Presen	tations					
	Midter Preper Midter	m Exam and ation for m Exam	1		3		
	Final I	Exam and	1		4		
	Preper Other	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	ies	1	2 3 4	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 sc engineering problem	and pertaining line; ical and in these olve s.		X		
		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.				X	-
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.			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.		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.			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.		X	
The Course's Lecturer(s) and Contact Informations	1.	Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr			

	Course Description Form
Course Code and Name	ETM 222 – COMPUTER-AIDED DESIGN-II
Course Semester	4
Catalog Content	Introduction and navigating the CATIA V5 environment, Sketcher workbench, Part design workbench, Drafting workbench, Sketcher workbench, Complex and multiple sketch parts, Assembly design workbench, Generative shape design workbench, DMU navigator, Rendering workbench, Parametric design, Assembly simulation, A general design example.
Textbook	<ol> <li>Cozzens, R., Catia V5 Workbook R19, SDC Pub., USA, 2009.</li> <li>Tickoo, S., Catia V5R20 for Designers, CADCIM Technologies, USA, 2010.</li> </ol>
Supplementary Teythooks	1. Computer-Aided Design
Crodit	3 FCTS
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	Basic concepts of computer aided design, computer aided design hardware and software, design modeling techniques and 2D modeling studies, design modeling techniques and 3D modeling studies, computer aided design modeling and assembly of machine parts.
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of advanced computer-aided design.</li> <li>They can use better and more efficient computational tools while designing.</li> </ol>
Instruction Methods	Face to face

	1. Week	Introduction	and navigating the CATIA V5 enviro	onment								
	2. Week	Sketcher wo	rkbench									
	3. Week	Part design v	workbench									
	4. Week	Drafting wor	rkbench									
	5. Week	Sketcher wo	rkbench									
	6. Week	Complex and	d multiple sketch parts									
	7. Week	Assembly de	esign workbench									
Weekly Schedule	8. Week	Generative s	hape design workbench									
	9. Week	Generative s	hape design workbench									
	10. Week	DMU naviga	ator									
	11. Week	Rendering workbench         Parametric design										
	12. Week											
	13. Week	Assembly sin	mulation									
	14. Week	A general design example										
	Weekly theo	retical course	hours: 2									
Teaching and Learning	Weekly tuto	rial hours: 0										
Methods												
	Reading Act	ivities: 2										
	Internet brow	wsing, library	work Designing and implementing ma	aterials: 0								
	Report prepa	aring: 1										
	Preparing a 1	Presentation:	1									
	Presentation	s: 1										
	Preparation	of Midterm an	nd Midterm Exam: 10									
	Final Exam	and Preparatio	on for Final Exam: 10									
			Numbers	Total Weighting (%)								
	Midterm E	xams	1	40								
	Assignmen	t	1	5								
	Application	n	1	15								
Assessment Criteria	Projects			15								
	Quiz											
	Percent of Studies (%	In-term )		60								
	Percentage Exam to Te	of Final otal Score		40								
	Attendance	•										

		Activity	Total Number of Weeks	Duration (weekly hour)					Total Period Work Load
	Weekl	y Theoretical Course	14			2			28
	Weekl	y Tutorial Hours	14	-		1			14
	Readin	ng Tasks							
	Studies								
	Materi Implen	al Design and nentation							
Workload	Report	Preparing		-					
	Preparing a Presentation								
	Midter	m Exam and	2			6			12
	Preper Midter	ation for m Exam							12
	Final H	Exam and	2			8			16
	Other	( should	1			5			5
	be emp	phasized)	-			-			-
	Total V	Workload	-			-			75
	Total V	Workload / 25							2
	Course	Program Outcom		-					3
Contribution Level Between Course Learning Outcomes and Program Outcomes		1       Adequate knowledge i mathematics, science a engineering subjects p to the relevant discipli ability to use theoretic applied information in			3 X		5		
	2	areas to model and se engineering problem Ability to identify, fo	olve s. ormulate,						
		and solve complex es problems; ability to s apply proper analysis modeling methods fo purpose.	ngineering select and s and or this			х			
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this				x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation rely.		x				
		1		1	1	<u> </u>	<u> </u>	I	

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.		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.		x	
The Course's Lecturer(s) and Contact Informations		Head of Department tasarim@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 302 MACHİNE ELEMENTS II						
Course Semester	6						
Catalog Content	<ol> <li>Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley</li> <li>E. Koç, Makine Elemanları-I, Nobel Kitabevi, 2007.</li> <li>E. Koç, Makine Elemanları Çözümlü Problemler, Nobel Kitabevi, 2007.</li> <li>A. Çetin Can, Makine Elemanları Tasarımı, Birsen Yayınevi, 2006.</li> <li>A. Bozacı, İ. Koçaş, Ö. Ü. Çolak, Makine Elemanlarının Projelendirilmesi, Çağlayan Kitabevi, 2001.</li> <li>A. Bozacı, Makine Elemanları Cilt –I, Çağlayan Kitabevi, 2005.</li> <li>H. Rende, Makine Elemanları Cilt –I, Seç Yayın Dağıtım, 2001.</li> <li>M. Gediktaş, Makine Elemanları Problemleri, Çağlayan Kitabevi, 2001.</li> </ol>						
Textbook	J. E. Shigley, Mechanical Engineering Design, McGrraw-Hill Book Company, 2003						
Supplementary Textbooks	Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley						
Credit	3 Credit / 4 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Introduction of machine elements, strength calculations and sizing, to have information about joints, gears, shafts, belt pulleys, bearings and so on. the ability to make design with						
Course Learning Outcomes	<ol> <li>Learning the types of machine elements.</li> <li>To learn the usage areas of machine elements.</li> <li>Dimensioning of machine elements.</li> <li>To learn the basic theories and calculations related to machine elements.</li> <li>Learning to use machine elements in design.</li> <li>Gaining the ability to identify, formulate and solve engineering problems.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	General Concepts									
	2. Week	Power and Motion									
	3. Week	Design of Shafts									
	4.	Design of Shafts									
	Week	Power transmission mecha	nisms								
	Week										
	6. Week	Belt Pulley Design									
Weekly Schedule	7. Week	Spur Gear Design									
	8. Week	Spur Gear Design									
	9. Week	Helical Gear Design									
	10. Week	Helical Gear Design,Bevel	Gear Design								
	11. Week	Bevel Gear Design									
	12. Week	Worm and Gear Design									
	13. Week	Bearing Design									
	14. Week	Bearing Design									
	Weekly th	neoretical course hours: 3									
Teaching and Learning Methods	Weekly tu	itorial hours: 0									
(These are examples. Please fill which	Reading A	Activities: 2									
activities you use in the course)	Internet bi materials:	rowsing, library work Design 3	ning and imple	menting							
	Report pro	eparing: 1									
	Preparing	a Presentation: 1									
	Presentati	ons: 1									
	Preparatio	on of Midterm and Midterm I	Exam: 10								
	Final Exa	m and Preparation for Final I	Exam: 10	Total							
			Numbers	Weightin g (%)							
	Midterm	1 Exams	X	40							
	Assignm	tion	X	10							
Assessment Cuitoria	Projects										
Assessment Uriteria	Practice										
	Quiz	of In-term Studies									
	(%)	or m-term studies		60							

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

		Activity	Total Number of Weeks	Du (w ho	ura veel	tio kly )	n		Total Period Work Load
	Weekly	y Theoretical Course	14	3					42
	Weekly	y Tutorial Hours							
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes		g Tasks	6	1				6	
	Studies	5							
	Materi	al Design and	8	2					16
	Report	Preparing							
Workload	Prepar	ing a Presentation	2	2					4
	Presen	tations	2	2					4
	Midter	m Exam and	4	5					20
	Prepera Midter	ation for m Exam							
	Final E	Exam and	4	2					8
	Preper	ation for Final Exam							
	be emp	bhasized)							
	Total V	Vorkload							100
	Total V	Workload / 25							100/25
	Course	Credit (ECTS)			-				4
	No	Program Outcon	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 discip ability to use theoret applied information areas to model and s engineering problem	e in e and pertaining oline; ical and in these olve s.					x	
	2	Ability to identify, fo and solve complex e problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this					x	
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this				x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and hes and nalysis and problems cations; ation rely.				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.		x	
The Course's Lecturer(s) and Contact Informations	Doç. tozka	Dr. Murat Tolga ÖZKAN an@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 304 SYSTEMATIC DESIGN-II						
Course Semester	6						
Catalog Content	Introduction, Design to allow for expansion, Design to allow for creep and relaxation, Design against corrosion, Design to minimise wear, Design for ergonomics, Design for aesthetics, Design for production, Design for maintenance, Design for recycling, Design for minimum risk, Design to standards, Embodiment design examples.						
Textbook	<ol> <li>Börklü, H.R. (Turkish trans.), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010.</li> <li>English and German Edition of the same book.</li> <li>Börklü, H.R. web site.</li> </ol>						
Supplementary Textbooks	<ol> <li>Journal of Engineering Design</li> <li>Computer-Aided Design</li> <li>Research in Engineering Design</li> </ol>						
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 learn systematic design subjects and methods, to gain the ability to apply. Developing a new product with systematic design approach and detailing in the shaping design process.						
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of systematic design approach.</li> <li>They can apply rules and methods of this approach while designing machines, so they can make designs based on scientific bases and methodical rules.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	1. Introduction								
	2.	Design to allow for expansi	ion							
	wеек 3.	Design to allow for creep a	nd relaxation							
	Week									
	4. Week	Design against corrosion								
	5. Week	Design to minimise wear								
	6. Week	Design for ergonomics								
	7. Week	Design for aesthetics								
Weekly Schedule	8. Week	Design for production								
	9. Week	Design for assembly								
	10.	Design for maintenance								
	11. Week	Design for recycling								
	12.	Design for minimum risk								
	Week	Design to standards								
	Week		1							
	14. Week	Embodiment design examp	les							
	Weekly th	eoretical course hours: 2								
Teaching and Learning Methods	Weekly tu	torial hours: 0								
(These are examples. Please fill which	Reading A	Activities: 0								
activities you use in the course)	Internet bi materials:	rowsing, library work Design 10	ing and imple	menting						
	Report pro	eparing: 10								
	Preparing	a Presentation: 5								
	Presentati	ons: 5								
	Preparatio	on of Midterm and Midterm I	Exam: 3							
	Final Exa	m and Preparation for Final I	Exam: 4							
			Numbers	Total Weightin						
				g (%)						
	Midterm	Exams	1	40	-					
	Assignm	ion	1	10	-					
	Projects	1011	1	10	1					
Assessment Criteria	Practice			10	1					
	Quiz				]					
	Percent (%)	of In-term Studies		60						
	Percenta	ge of Final Exam to Total		40	1					
	Score (%									

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Dun (we hou	ration ekly ir)		Total Period Work Load
	Weekly Hours	y Theoretical Course	14		2		28
	Weekl	y Tutorial Hours					
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes		ıg Tasks					
		5	2		5		10
		al Design and	2	5		10	
	Report	Preparing	2		5		10
Workload	Prepar	ing a Presentation	1		5		5
	Presen	tations	1		5		5
	Midter Prepera Midter	m Exam and ation for m Exam	1		3		3
		Exam and ation for Final Exam	1		4		4
		(should					
		ohasized) Vorkload					75
	Total V	Workload / 25	-		-		75/25
	Course	e Credit (ECTS)					3
	No	Program Outcom	nes	1 1	23	1 5	<b>/</b>
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 is areas to model and se engineering problem	lge in nee and ets pertaining cipline; retical and on in these d solve ems.		x		
	2	Ability to identify, fo and solve complex en problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this		x		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this			x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.			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.		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.			х		
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.		2	X	
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Hüseyin Rıza BÖRK rborklu@gazi.edu.tr	LÜ			

Course Description Form					
Course Code and Name	ETM 306 - PRODUCT DESIGN IV				
Course Semester	6				
Catalog Content	Introduction, Choosing a complex and real problem of product design-III, Conducting a literature review and preparing its requirements list, Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.), Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach), Making its prototypes and tests, Writing a report and preparing its presentations and then presenting it in the classroom, Choosing a complex and real problem of product design-IV (repeating the same processes).				
Textbook	<ul> <li>Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006.</li> <li>Morris, R., Fundamentals of Product Design, AVA Pub., 2009.</li> </ul>				
Supplementary Textbooks	- Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.				
Credit	4 ECTS				
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements				
Type of the Course	Obligatory				
Instruction Language	Turkish				
Course Objectives	To learn the subjects and methods of product design, to gain the ability to apply. Developing a new idea in accordance with the given concepts. After preparing free hand drawings of this idea, three dimensional modeling in computer-aided programs and product prototyping with various production techniques.				
Course Learning Outcomes	<ul><li>Students who attend this course learn basis of product design.</li><li>They can make better and scientific product designs.</li></ul>				
Instruction Methods	Expression				

	1. Week Introduction								
	2. Week Choosing a complex and real problem of product design-I								
	3. Week	Conducting a literature re list	eview and prep	paring its requ	irements				
	4. Week	Preparing its calculations (according to aesthetics/	, analysis, des ergonomics/te	signs and sketc chnologic etc.	ches				
	5. Week	5. Week Preparing its computer-aided calculations, models, and animations (according to systematic approach)							
	6. Week	6. Week Making its prototypes and tests							
	7. Week	Writing a report and prep presenting it in the classro	aring its prese	entations and t	hen				
Weekly Schedule	8. Week	. Week Choosing a complex and real problem of product desi							
	9. Week	Conducting a literature re list	eview and prep	paring its requ	irements				
	10. Week	Preparing its calculations (according to aesthetics/ e	, analysis, des ergonomics/te	signs and sketc chnologic etc.	ches .)				
	11. Week	Preparing its computer-ai and animations (accordin	ded calculation g to systemation	ons, models, an ic approach)	nalysis				
	12. Week	Making its prototypes and	d tests						
	13. Week	Preparing its handbook an	nd user's man	ual					
	14. Week	Writing a report and prep presenting it in the classro	aring its prese	entations and t	hen				
	Weekly theo	pretical course hours: 4							
Teaching and Learning Methods	Weekly tuto	orial hours: 4							
(These are examples. Please fill which activities you use in the course)	Reading Ac	tivities: 0							
	Internet brown materials: 24	wsing, library work Design 4	ing and imple	ementing					
	Report prep	aring: 0							
	Preparing a	Presentation: 0							
	Presentation	ns: 0							
	Preparation	of Midterm and Midterm E	Exam: 8						
	Final Exam	and Preparation for Final E	Exam: 8	Total					
			inumbers	Weightin g (%)					
	Midterm E	Exams	1	40	-				
	Assignmer Applicatio	nt n							
	Projects		1	20					
Assessment Uriteria	Practice								
	Quiz Percent of	In term Studies							
	(%)	m-term Studies		60					
	Percentage Score (%)	e of Final Exam to Total	1						
	Attendance	e							

		Activity	Total Number of Weeks	Durat (week hour)	tion ly		Total Period Work Load
	Weekly	y Theoretical Course	14		2		28
		y Tutorial Hours	14 2			28	
	Readin	ig Tasks					
	Studies	5	5		1		5
	Materi	al Design and	12		1		12
	Report	Preparing	8		1		8
Workload	Prepar	ing a Presentation	5		2		10
	Presen	tations	5		1		5
	Midter Preper Midter	m Exam and ation for m Exam	1		2		2
	Final F	Exam and	1		2		2
	Other (	should					
	be emp	hasized)					100
	Total V	Workload	-		-		100
	Total V	Vorkload / 25					100/23
	Course	Program Outcom	les				-
	No 1	Adequate knowledge mathematics, science	e in e and	1 2	3 4	5 x	
Contribution Level Between Course Learning Outcomes and Program Outcomes		engineering subjects to the relevant discip ability to use theoret applied information areas to model and s engineering problem	pertaining lline; ical and in these olve s.				
	2	ormulate, ngineering select and s and or this			x		
		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.					
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.			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.			X		1
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.		x	
The Course's Lecturer(s) and Contact Informations	Assoc isahii	. Prof. İsmail Şahin n@gazi.edu.tr			

Course Description Form					
Course Code and Name	ETM 311 - Thermodynamics				
Course Semester	5				
Catalog Content	Course content and properties of pure substances. Ideal and real gases. Energy, heat, work. Energy conservation, indoor and outdoor systems implementation. Heat machine. The second law of thermodynamics. Carnot Cycle. Clausius inequality, entropy. The increase of entropy principle. Exergy, the second law analysis. Gas power cycles. Steam power cycles. Refrigeration cycles,				
Textbook	<ol> <li>Çengel, Y. ve Boles, M., Mühendislik Yaklaşımıyla Termodinamik, (Çe. T. Derbentli), McGraw-Hill, İst., 1996.</li> <li>Çengel, Yunus A. Fundamentals of thermal-fluid science, McGraw-Hill</li> <li>Öztürk, A. ve Kılıç, A., Çözümlü Problemlerle Termodinamik, Çağlayan Kitabevi, 1998.</li> </ol>				
Supplementary Textbooks	Öztürk, A. and Kılıç, A., Thermodynamics with Solved Problems, Çağlayan Kitabevi, 1998.				
Credit	3 ECTS				
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements				
Type of the Course	Obligatory				
Instruction Language	Turkish				
Course Objectives	The aim of this course is to introduce the concepts of system definition, environment relation, thermodynamic laws, entropy, usability and irreversibility concepts in thermodynamic system analysis, thermodynamic cycles and thermodynamic analysis of gas mixtures.				
Course Learning Outcomes	Students can use energy transformation principles and terminology, design thermal engineering systems, know thermodynamics laws any solve problems in the related areas.				
Instruction Methods	Expression, practice.				

Week         Basic concepts and definitions. Dimensions and units           Week         Properties of Systems. State and equilibrium. State change an cycles. Pressure. Temperature. The Zeroth Law of Thermodynamics
week Properties of Systems. State and equilibrium. State enange an cycles. Pressure. Temperature. The Zeroth Law of Thermodynamics
cycles. Pressure. Temperature. The Zeroth Law of Thermodynamics
Thermodynamics
Thermodynamics.
<b>2.</b> Pure substance and properties. Phases of pure substance an
Week phase change. Properties diagrams and tables.
2 Ideal are and equation of state Deal areases
<b>5.</b> I utear gas and equation of state. Kear gasses.
week Compressibility factor. Generalized chart for
Compressibility factor. Other equations of state.
Introduction to the first law of thermodynamics.
4. 1st law of thermodynamics (for closed systems).
Week Heat and work. Specific heats. Internal energy, enthalpy,
specific heat of ideal gasses. Specific heat of solids and
liquids
5. First law of Thermodynamics (for open systems).
Week         Conservation of mass. Conservation of energy.
Flow work. Open systems with steady flow.
Lucture du concernations. The uniform state
<b>6.</b> Unsteady open systems. The uniform-state,
week uniform-flow systems. Second law of Thermodynamics.
Heat engines. Refrigeration systems and heat pumps.
skly Schedule
7. Reversible and irreversible processes. Carnot cycles.
Week Carnot principles. The thermodynamic temperature scale.
8. Clausius inequality. Entropy. Principle of the increase of
Week Entropy. Third law of Thermodynamics. Entropy change of
pure substance. Temperature-Entropy (T-s) diagram.
9 Entropy change of ideal gasses Reversible steady flow work
Week Adjubatic afficiency of some engines. Every and second la
Adiabatic efficiency of some engines. Exergy and second law
Solution.
<b>10.</b> Second law solution of closed and open systems. Power cycle
10.       Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.
10.     Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.       11     Ottagen le Discharghen Destances le Discha
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle with the base of t</li></ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles</li> </ul>
10. WeekSecond law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.11. WeekOtto and Diesel cycles. Brayton cycle. Brayton cycle with regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> </ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12. Refrigeration cycles: Refrigerators and heat pumps. Reverse</li> </ul>
<ul> <li>10.</li> <li>Week</li> <li>11.</li> <li>Wteek</li> <li>Otto and Diesel cycles. Brayton cycle. Brayton cycle with regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12.</li> <li>Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat</li> </ul>
<ul> <li>10.</li> <li>Week</li> <li>11.</li> <li>Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12.</li> <li>Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.</li> </ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12. Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.</li> <li>13. Ideal gas mixtures. Air-vapor mixture.</li> </ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12. Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.</li> <li>13. Ideal gas mixtures. Air-vapor mixture.</li> </ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12. Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.</li> <li>13. Ideal gas mixtures. Air-vapor mixture.</li> </ul>
<ul> <li>10. Second law solution of closed and open systems. Power cycle with gas flow: Air standard assumptions.</li> <li>11. Otto and Diesel cycles. Brayton cycle. Brayton cycle wit regeneration. Ideal jet propulsion cycles. Vapor power cycles Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.</li> <li>12. Refrigeration cycles: Refrigerators and heat pumps. Reverse Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.</li> <li>13. Ideal gas mixtures. Air-vapor mixture.</li> <li>14. Applications.</li> </ul>

	Weekly theoretical course hours: 2									
Teaching and Learning Methods	Weekly tutorial hours: 3									
(These are examples. Please fill which	Reading Activities: 0									
activities you use in the course)	Internet browsing, library work Design materials: 8	ing and imple	menting							
	Report preparing: 0									
	Preparing a Presentation: 0									
	Presentations: 0									
	Preparation of Midterm and Midterm I	Exam: 6								
	Final Exam and Preparation for Final I	Exam: 6								
		Numbers	Total Weightin g (%)							
	Midterm Exams	1	40							
	Assignment									
	Application	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	Duration (weekly hour)		Total Period Work Load
	Weekly	y Theoretical Course	14	3		42
		y Tutorial Hours				
	Readin	ıg Tasks				
	Studies	5	6	3		18
	Materi	al Design and	1	3		3
	Report	Preparing				
Workload	Prepar	ing a Presentation				
	Presen	tations				
	Midter Preper Midter	m Exam and ation for m Exam	2	3		6
	Final F	Exam and	2	3		6
	Other (	should				
	be emp	bhasized)				
	Total V	Workload	-	-		75
	Total V	Workload / 25				75/25
	Course	Program Outcom	205			3
	No		105	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 se engineering problem	x			
	2	Ability to identify, fo and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this	x		
		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.				
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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			1
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.		x	
The Course's Lecturer(s) and Contact Informations	Depai tasar	tment Management im@gazi.edu.tr			

Course Description Form										
Course Code and Name	ETM 313 Machine Elements 1									
Course Semester	5									
Catalog Content	Machine Design is divided 2 sections. One is Basic machine elements and second advanced machine elements. Basic machine elements basic joints such as, riveted joints, welded joints, threaded joints etc. In this course contains Hypothesis of Stresses, Static, Dynamic and full variable stress loading on jointed machine elements.									
Textbook	<ol> <li>Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley</li> <li>J. E. Shigley, Mechanical Engineering Design, McGrraw-Hill Book Company, 2003</li> </ol>									
Supplementary Textbooks	H. Rende, Makine Elemanları Cilt –I, Seç Yayın Dağıtım, 2001.									
Credit	3 Credit / 3 AKTS									
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements									
Type of the Course	Compulsory									
Instruction Language	Turkish									
Course Objectives	Introduction to machine elements, fasteners and methods, material strength, strength, stress, static and dynamic calculations.									
Course Learning Outcomes	<ol> <li>Learning the types of machine elements.</li> <li>To learn the usage areas of machine elements.</li> <li>Dimensioning of machine elements.</li> <li>To learn the basic theories and calculations related to machine elements.</li> <li>Learning to use machine elements in design.</li> <li>Gaining the ability to identify, formulate and solve engineering problems.</li> </ol>									
Instruction Methods	Face to face Practical training									
	1.     Basic Concept       Week     Basic Concept									
--	---	---------------------------------------	---------------------	-------------------	--	--	--	--	--	--
	2. Week	Basic Stresses								
	3. Week	Hooke Law								
	4. Week	4. Strenght of Matereial Week								
	5. Week	Hypothesis of Stresses, Sta stress	tic, Dynamic a	and full variable						
	6. Joints: Riveted Joints Week									
Weekly Schedule	7. Week									
-	8. Week	Riveted Joints								
	9. Week	Welded Joints								
	10. Week	Welded Joints								
	11. Week	Fastener Joints								
	12. Week	Fastener Joints								
	13. Week	Fastener Joints								
	14.Fastener JointsWeek									
	Weekly th	eoretical course hours: 3								
Teaching and Learning Methods	Weekly tu	torial hours: 0								
(These are examples. Please fill which activities vou use in the course)	Reading A	Activities: 2								
	Internet bi materials:	rowsing, library work Desigr 3	ing and imple	menting						
	Report pro	eparing: 1								
	Preparing	a Presentation: 1								
	Presentati	ons: 1								
	Preparatio	on of Midterm and Midterm I	Exam: 10							
	Final Exa	m and Preparation for Final I	Exam: 10 Numbers	Total						
	Weightin g (%)									
	Midterm	Exams	X	40						
	Assignm	ion	X	10						
Accomment Cuitaria	Projects 10									
Assessment Criteria	Practice									
	Quiz	of In town Studies								
	(%)	or in-term Studies		60						

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

		Activity	Total Number of Weeks	Dı (w ho	ırati eekly ur)	on y		Total Period Work Load
-		Weekly Theoretical Course		3				42
		y Tutorial Hours						
	Readin	ig Tasks						
	Studies	5						
	Materi	al Design and	3	2				6
	Report	Prenaring						
Workload	Prepar	ing a Presentation	4	1				4
	Presen	tations	3	3				9
	Midter	m Exam and	3	2				6
	Preper Midter	ation for m Exam						
	Final E	Exam and	4	2				8
	Preper Other	ation for Final Exam						
	be emp	phasized)						
	Total V	Workload						75
	Total V	Workload / 25						3
	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 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.					x	
	2	2 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 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.				x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and hes and nalysis and problems cations; ation rely.			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.			x		
The Course's Lecturer(s) and Contact Informations	Doç. Dr. Murat Tolga ÖZKAN tozkan@gazi.edu.tr						

Course Description Form				
Course Code and Name	ETM 314 INNOVATION AND CREATIVITY			
Course Semester	6			
Catalog Content	Introduction, Innovation and creativity, Design and design work: Design as product, process and mental activity, Innovative and creative designs, How designers think and solve problems: Thinking and thinking methods, creative thinking and learning, developing concepts, Creative phases in designing: concepts of fantasy, imagination and reality, Metaphor and paradox: explaining creation, Imagination of forms: Rutin design, innovative design, creative design, The history and description of TRIZ (TIPS), 40 principles and their use in design, The contradiction matrix and its use in design, The other TRIZ tools (material field analysis), Design applications of TRIZ, A general design project.			
Textbook	<ol> <li>Goldenber, J. and Mazarsky, D., Creativity in Product Innovation, Cambridge Univ. Press, Int. Ed., 2002.</li> <li>Niku, S.B., Creative Design of Products and Systems, John Wiley &amp; Sons, Inc., Int. Ed., 2009.</li> </ol>			
Supplementary Textbooks	<ol> <li>Int. Journal of Design Creativity and Innovation</li> <li>Int. Journal of Design Engineering</li> </ol>			
Credit	2 AKTS			
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements			
Type of the Course	Compulsory			
Instruction Language	Turkish			
Course Objectives	To learn the subjects and methods of innovation and creativity, to gain the ability to practice. To comprehend the areas where innovation can be realized and what can be done for its continuity. To learn the methods used to develop creativity and how to apply these methods.			
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of innovation and creativity.</li> <li>They can make better designs based on this course.</li> </ol>			
Instruction Methods	Face to face Practical training			

	1. Introduction								
	2. Week	Innovation and creativity							
	3. Week	Design and design work: De activity	esign as produ	ict, process and	mental				
	4. Week	4. Innovative and creative designs							
	5. Week	How designers think and so methods, creative thinking a	lve problems	Thinking and t developing cond	hinking cepts				
	6. Week	Creative phases in designing and reality	g: concepts of	f fantasy, imagir	nation				
Weekly Schedule	7. Week	on							
	8. Week	Imagination of forms: Rutin design	ı design, inno	vative design, ci	reative				
	9. Week	The history and description	of TRIZ (TH	PS)					
	10. Week	40 principles and their use i	n design						
	11. Week	The contradiction matrix an	id its use in de	esign					
	12. Week	The other TRIZ tools (material field analysis)							
	13. Week	Design applications of TRIZ							
	14.     A general design project       Week     Veek								
	Weekly theoretical course hours: 2								
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which	Reading A	Activities: 0							
activities you use in the course)	Internet bi materials:	rowsing, library work Design 10	ing and imple	menting					
	Report pro	eparing: 6							
	Preparing	a Presentation: 3							
	Presentati	ons: 3							
	Preparatio	n of Midterm and Midterm E	Exam: 3						
	Final Exa	m and Preparation for Final E	Exam: 4						
	Numbers Total Weightin								
	Midterm	Exams	1	40					
	Applicat	ion	1	20					
Assessment Criteria	Projects Practice								
	Quiz								
	Percent (%)	of In-term Studies		60					

Source (70)

		Activity	Total Number of Weeks	Duration (weekly hour)		Total Period Work Load
	Weekl	y Theoretical Course	14	2		28
		y Tutorial Hours				
		ng Tasks				
	Studie	s	2	2		4
	Materi	al Design and	2	3		6
	Report	t Preparing	1	3		3
Workload	Prepar	ing a Presentation	1	3		3
	Presen	tations	1	2		2
	Midter Preper Midter	m Exam and ation for m Exam	1	3		3
	Final H	Exam and	1	4		4
	Other	( should				
	be emp	phasized)				
	Total V	Workload / 25	-	-		53
	Total Workload / 25					2 2 2 2 2 2
	N	Program Outcom	nes		~	2
Contribution Level Between Course Learning Outcomes and Program Outcomes	1 2	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and se engineering problem	e in pertaining pertaining iline; ical and in these olve s.	1 2 3 4 X	5	
		and solve complex e problems; ability to s apply proper analysis modeling methods fo purpose.	ngineering select and s and or this			
	3	Ability to design a consystem, process, dever product under realist constraints and cond such a way as to meet desired result; ability modern design methor purpose.	omplex ice or ic itions, in et the v to apply ods for this		x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.		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.		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.			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.			2	X		
The Course's Lecturer(s) and Contact Informations	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

Course Description Form					
Course Code and Name	ETM 315 SYSTEMATIC DESIGN-I				
Course Semester	5				
Catalog Content	Introduction, Fundamentals of technical systems, Fundamentals of systematic approach, Product planning, Solution finding methods, Methods of selection and evaluation, Clarification of task (design specification), Conceptual design process, The application of conceptual design, Conceptual design examples, Embodiment design, Basic rules of embodiment design, Principles of embodiment design, Embodiment design examples.				
Textbook	<ol> <li>Börklü, H.R. (Turkish trans.), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010.</li> <li>English and German Edition of the same book.</li> <li>Börklü, H.R. web site.</li> </ol>				
Supplementary Textbooks	<ol> <li>Journal of Engineering Design</li> <li>Computer-Aided Design</li> <li>Research in Engineering Design</li> </ol>				
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 learn systematic design subjects and methods, to gain the ability to apply. To comprehend the stages of systematic design method and to sh these steps in a new product design process. Understand the importance using a design approach by obtaining more design options than usual wi this method.				
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of systematic design approach.</li> <li>They can apply rules and methods of this approach while designing machines, so they can make designs based on scientific bases and methodical rules.</li> </ol>				
Instruction Methods	Face to face Practical training				

	1. Week	Introduction							
	2.	Fundamentals of technical	systems						
	Week	Fundamentals of systematic	c annroach						
	Week	i undumentaris or systemati	e upprouen						
	4. Week	Product planning							
	- weeк 5.	Solution finding methods							
	Week								
	6. Week	Methods of selection and e	evaluation						
	7. Week	Clarification of task (desig	n specification	ı)					
Weekly Schedule	8.	Conceptual design process							
	Week 9	The application of concept	ual design						
	Week		dui design						
	10. Week	Conceptual design example	es						
	11. Week	Embodiment design							
	12.	Basic rules of embodiment	design						
	Week 13.	Principles of embodiment of	design						
	Week	Embodiment design examp							
	Week		nes						
	Weekly th	eoretical course hours: 3							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which	Reading A	Activities: 0							
activities you use in the course)	Internet bi	rowsing, library work Design	ning and imple	menting					
	materials:	10	6 1	U					
	Report pro	eparing: 10							
	Preparing	a Presentation: 5							
	Presentati	ons: 5							
	Preparatio	n of Midterm and Midterm 1	Evam: 3						
	Final Exai	m and Preparation for Final	Exam: 4 Numbers	Total					
				Weightin					
	Midterm	Exams	1	40	-				
	Assignm	ion	1	10	-				
	Projects	10	-						
Assessment Criteria	Practice								
	Quiz	07							
	Percent ( (%)	60							
	Percenta	ge of Final Exam to Total		40	1				
	Score (%	(o)							

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Durat (week hour)	ion ly		Total Period Work Load
	Weekly Theoretical Course Hours		14		3		42
		y Tutorial Hours					
	Readin	ıg Tasks					
	Studie	5	2	5			10
	Materi	al Design and	2	3			6
	Report	Preparing	1	5			5
Workload	Prepar	ing a Presentation	1		3		3
	Presen	tations	1		2		2
	Midter Preper Midter	m Exam and ation for m Exam	1		3		3
	Final E	Exam and	1		4		4
	Other	( should					
	be emp	bhasized)					
	Total V	Workload	-		-		75
	Total V	Workload / 25					75/25
	Course	Program Outcom	nes.			_	3
	No	i iografii Outeon	103	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 theoreti applied information i areas to model and se engineering problem	and pertaining line; ical and in these olve s.		X		
	2	Ability to identify, fo and solve complex en problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this		X		
		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.				x	
		Ability to develop, so use modern techniqu tools necessary for an solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems ations; ation ely.			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.		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.			х		
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.		2	X	
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Hüseyin Rıza BÖRK rborklu@gazi.edu.tr	LÜ			

Course Description Form						
Course Code and Name	ETM 107 – FLUID MECHANICS					
Course Semester	6					
Catalog Content	Introduction, Fluid statics, Elementary fluid dynamics – Bernolli equation, Fluid kinematics, Finite control valume analysis, Differential analysis of fluid flow, Dimensional analysis, similitude, and modelling, Viscous flow in pipes, Flow over immersed bodies, Open-channel flow, Compressible flow, Turbomachines.					
Textbook	Munson, B.R., Young, D.F., Okiishi, T.H. and Huebsch, W.W., Fundemantals of Fluid Mechanics, Wiley Pub. 2009. White, F.M., Fluid Mechanics, McGraw-Hill P., Int. Ed., 2011.					
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	Compulsory					
Instruction Language	Turkish					
Course Objectives	Introduce the basic concepts of fluid mechanics, the basic equations of fluid mechanics to identify, formulate, and solve the problems of teaching students how to use.					
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis and subjects of fluid mechanics.</li> <li>They can work better and more efficiently while designing.</li> </ol>					
Instruction Methods	Face to face Practical training					

	1. Week	Introduction							
	2. Week	Fluid statics							
	weeк	Elementary fluid dynamics	Damalli ag	untion					
	3. Week	Elementary fluid dynamics	– Bernom eq	uation					
	4. Week	Fluid kinematics							
	5. Week	5. Finite control volume analysis							
	6. Week	Differential analysis of flui	d flow						
Weekly Schedule	7. Week	Dimensional analysis, simi	ltude, and mod	delling					
Weekly Selfedule	8. Week	Viscous flow in pipes							
	9. Week	Flow over immersed bodie	s						
	10. Week	Applications							
	11. Week	Open-channel flow							
	12. Week	Compressible flow							
	13. Week	Applications							
	14. Week	Turbomachines							
	Weekly th	eoretical course hours: 3							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0							
ucuvines you use in the course)	Internet bi materials:	rowsing, library work Desigr 5	ning and imple	ementing					
	Report pro	eparing: 0							
	Preparing	a Presentation: 0							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm I	Exam: 3						
	Final Exa	m and Preparation for Final l	Exam: 4	1	1				
			Numbers	Total Weightin					
				g (%)					
	Midterm	Exams	1	40					
	Assignm	lent							
	Applicat	101	1	20	-				
Assessment Criteria	Projects				-				
	Ouiz		-						
	Percent	of In-term Studies		60	1				
	(%)								
	Percenta Score (%	ge of Final Exam to Total		40					

Attendance	
	<u>.</u>
-	

		Activity	Total Number of Weeks	Duration (weekly hour)	1	Total Period Work Load
	Weekly Hours	y Theoretical Course	14	3		42
		y Tutorial Hours				
	Readin	ng Tasks				
	Studies	S	2	5		10
	Materi	al Design and	2	5		10
	Implen	nentation Proposition	2	2	10	
Workload	Prepar	ing a Presentation	2	2		4
	Presen	tations				
	Midter	m Exam and				
	Preper	ation for	1	4		4
	Midter Final F	m Exam Exam and				
	Preper	ation for Final Exam	1	5		5
	Other (	(should				
	Total V	Workload	-	_		75
	Total V	Workload / 25				75/25
	Course	e Credit (ECTS)				3
	No	Program Outcom	nes	1 2 2	1 5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	1 1 2 3 4	Adequate knowledge mathematics, science engineering subjects to the relevant discip ability to use theoret applied information areas to model and s- engineering problem Ability to identify, fo and solve complex e- problems; ability to s- apply proper analysis modeling methods fo purpose. Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho- purpose. Ability to develop, s- use modern technique tools necessary for a solution of complex	e in e and pertaining pline; ical and in these olve is. ormulate, ngineering select and s and or this omplex ice or ic itions, in et the y to apply ods for this elect and less and nalysis and problems			
		ability to use informatechnologies effectiv	ation rely.			

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.		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.			х		
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.		2	x		
The Course's Lecturer(s) and Contact Informations		Doç. Dr. Veysel ÖZEDEMİR vozdemir@gazi.edu.tr					

	Course Description Form
Course Code and Name	ETM 317 - PRODUCT DESIGN III
Course Semester	5
Catalog Content	Introduction, Choosing a problem of product design-I, Conducting a literature review and preparing its requirements list, Preparing its calculations, analysis, designs and sketches, Preparing its computer-aided calculations, models, analysis and animations, Making its prototypes and tests, Writing a report and preparing its presentations and then presenting it in the classroom, Choosing a problem of product design-II (repeating the same processes).
Textbook	<ul> <li>Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006.</li> <li>Morris, R., Fundamentals of Product Design, AVA Pub., 2009.</li> </ul>
Supplementary Textbooks	- Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.
Credit	3 ECTS
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	To learn the subjects and methods of product design, to gain the ability to apply. To provide the student with all the equipment and features that may be needed in the process of transforming an idea into reality.
Course Learning Outcomes	<ul><li>Students who attend this course learn basis of product design.</li><li>They can make better and scientific product designs.</li></ul>
Instruction Methods	Expression

	1. Week Introduction							
	2. Week	Choosing a problem of p	roduct design-	I				
	3. Week	Conducting a literature re list	eview and prep	paring its requ	irements			
	4. Week	Preparing its calculations	, analysis, des	signs and skete	ches			
	5. Week	Preparing its computer-aided calculations, models, analy and animations						
	6. Week	6. Week Making its prototypes and tests						
	7. Week	Writing a report and prep presenting it in the classr	oaring its prese oom	entations and t	then			
Weekly Schedule	8. Week	Choosing a problem of p	roduct design-	-II				
	9. Week	eek Conducting a literature review and preparing its requir list						
	10. Week	Preparing its calculations	s, analysis, des	signs and skete	ches			
	11. Week	Preparing its computer-as and animations	ided calculation	ons, models, a	nalysis			
	12. Week	Making its prototypes an	d tests					
	13. Week	Preparing its handbook a	nd user's man	ual				
	14.	Writing a report and prep	paring its prese	entations and t	then			
	Week	presenting it in the classr	oom					
	Weekly theo	pretical course hours: 3						
Teaching and Learning Methods	Weekly tuto	orial hours: 3						
(These are examples. Please fill which	Reading Ac	tivities: 0						
ucuvines you use in the course)	Internet bro materials: 1	wsing, library work Desigr 8	ning and imple	ementing				
	Report prep	aring: 0						
	Preparing a	Presentation: 0						
	Presentation	ns: 0						
	Preparation	of Midterm and Midterm I	Exam: 6					
	Final Exam	and Preparation for Final I	Exam: 6					
			Numbers	Total Weightin g (%)				
	Midterm F	Exams	1	40				
	Assignmen	nt						
	Applicatio Projects	n	1	20				
Assessment Criteria	Practice		L	20				
	Quiz							
	Percent of In-term Studies 60							
	Percentage Score (%)	e of Final Exam to Total	1					
	2 mondano	~		1	4			

		Activity	Total Number of Weeks	Total NumberDuration (weekly hour)				
	Weekl	y Theoretical Course	14		2		28	
	Weekly Tutorial Hours		14		2		28	
	Readin	ng Tasks						
	Studies	S	5		1		5	
	Materi Impler	al Design and nentation	12	1			12	
Workload		Preparing	8	1			8	
		ing a Presentation	5		2		10	
	Presen	tations	5		1		5	
	Midter Preper	m Exam and ation for	1		2		2	
	Midter Final F	m Exam Exam and	1		2		2	
	Preper	ation for Final Exam	1		2		2	
	Other ( be emp	(should bhasized)						
	Total V	Workload	-		-		100	
	Total V	Workload / 25					100/25	
	Course	e Credit (ECTS)					4	
	No	Program Outcom	nes	1 2	3 4	5		
Contribution Level Between Course Learning Outcomes and Program Outcomes		1 Adequate knowledge in mathematics, science an engineering subjects per to the relevant discipline ability to use theoretical applied information in th areas to model and solve engineering problems.				х		
	2	Ability to identify, fo and solve complex er problems; ability to s apply proper analysis modeling methods fo purpose.	ormulate, ngineering select and s and or this		X			
		Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this			x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems eations; ation ely.		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.		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.			х		
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.			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.				x	

	15	Knowledge about awareness of the legal consequences of engineering solutions.		X		
The Course's Lecturer(s) and Contact Informations	Assoc isahii	. Prof. İsmail Şahin n@gazi.edu.tr				

Course DescriptionForm							
Course Code and Name	ETM 319 - Ergonomics						
Course Semester	5						
Catalog Content	Introduction (aspects of ergonomics, design examples), What is ergonomics and how it can be applied in design, ergonomics designs, Fundamentals of ergonomic design, human and his work in terms of ergonomics, Environmental factors and how they influence human, Organizing ergonomically offices, Contacts (interfaces) between human and machines, Description of anthropometric scales, control of ergonomically offices, Lifting loads and applications of moments, Designing ergonomic tools and instruments, Examples of ergonomic product designs and their evaluations, Control of suitability for ergonomics, Design examples which are suitable in terms of aesthetics and ergonomics, Presentations of student projects and their evaluations.						
Textbook	<ol> <li>Karwowski, W., Soares, M.M. and Stanton, N.A., Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques, CRC Press, 2011.</li> <li>Babalık, F., Mühendisler İçin Ergonomi - İşbilim, Dora, 3. Bas.</li> </ol>						
Supplementary Textbooks	<ol> <li>Ergonomics</li> <li>Applied Ergonomics</li> </ol>						
Credit	3 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 AttendanceRequirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	To learn ergonomics subjects and methods, to gain the ability to apply to the design of environmentally compatible products considering the physical and cognitive abilities of human						
Course Learning Outcomes	<ol> <li>Students who attend this course learn basics of aesthetics and ergonomics.</li> <li>They can work based on rules of aesthetics and ergonomics while designing.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	oles							
	2. Week	Compiling works that they evaluation	can put on the	eir portfolio,					
	3.	Establishment and evaluation	on of corporat	e identity for					
	Week	portfolio design	1 .	• • • • • •					
	4. Week	Clarification of logo design sketch	and corporat	e identity design by					
	5. Week	Creating their own digital Portfolio layout - Detailing Week							
	6. Week	6. Information about the illustrator program - introduction – basic commands							
	7. Week	Teaching the illustrator pro	ogram - subme	nu - practice					
Weekly Schedule	8.	Continuing to teach the illu	strator progra	m —					
	Week	creating graphics - applicat	tion	m					
	y. Week	Digital creation of corporat	te identity	III —					
	10. Week	Continuing to teach the illu Begin to create digital port	strator progra	m —					
	11. Week	Applying Digital Portfolios	5						
	12. Week	Completion of Digital Port	folio						
	13. Week	Giving and applying the the printed portfolio	eoretical infor	mation for the					
	14. Week	Final Exam- Digital and Pr	inted Portfolio	DS					
	Weekly th	eoretical course hours: 3							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0							
ucuvines you use in the course)	Internet bi materials:	rowsing, library work Desigr 0	ning and imple	menting					
	Report pro	eparing: 0							
	Preparing	a Presentation: 30							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm I	Exam: 0						
	Final Exa	m and Preparation for Final I	Exam: 0						
			Numbers	Total Weightin g(%)					
	Midterm	40							
	Assignment 1 20								
Assessment Criteria	Projects	avn							
Assessment Uriteria	Practice								
	Quiz Percent ( (%)	of In-term Studies		60					
	(**)								

Percentage of Final Exam to Total Score (%)	1	40
Attendance		

		Activity	Total Number of Weeks	Durati (weekly hour)	on y	Total Period Work Load
	Weekly Theoretical Course		14	3	5	42
	Weekly Tutorial Hours					
	Readir	ng Tasks				
	Studies		10	2	2	20
	Material Design and					
	Report	Prenaring	4	1		4
Workload		ing a Presentation	1	3	3	
	Presen	tations				
	Midter Preper Midter	m Exam and ation for m Exam	1	3		3
	Final I	Exam and	1	3	5	3
	Preper Other	ation for Final Exam	_	-		_
	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 discip ability to use theoret applied information areas to model and sc engineering problem	e in e and pertaining oline; ical and in these olve s.	X		
	2	Ability to identify, for and solve complex er problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this	x		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems eations; ation ely.	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.		x	
The Course's Lecturer(s) and Contact Informations	Depart tasarim	ment Management @gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 321 – COMPUTER-AIDED ENGINEERING						
Course Semester	5						
Catalog Content	Introduction, Example of Spring Systems in Finite Element Analysis, Bars and Trusses, Beams and Frames, 2D Elasticity, Plate and Surface Model Analyzes, 3D Elasticity, Design Optimization, Failure Analysis						
Textbook	<ol> <li>Xiaolin Chen, Yijun Liu, Finite Element Modelling and Simulation with ANSYS Workbench, Taylor &amp; Francis Group, ISBN, 13: 978-1-4398-7385-4, 2015.</li> <li>Saeed Moaveni , Finite Element Analysis—Theory and Application with ANSYS, Prentice Hall, 2008.</li> </ol>						
Supplementary Textbooks	<ol> <li>Computer-Aided Design</li> <li>Research in Engineering Design</li> <li>Int. Journal of Computer-Aided Engineering</li> </ol>						
Credit	2 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Teaching the basic finite element analysis (FEA) theory and commercial FEA software applications for modeling and simulation of engineering problems.						
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of computer-aided engineering.</li> <li>They can use better and more efficient computational tools while designing.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. W	Introduction, Basic Principle	es of Finite E	lement Analys	sis			
	2. Week	Spring System Example in F	Finite Elemen	t Analysis				
	3. Week	1-D Elasticity Theory - Mod	leling of Bars	s and Lattice S	ystems			
	4. Week	Computer Applications - Ba	r and Truss S	System Modeli	ng			
	5. Week	Beam Theory; Beam and Fra	ame Modelin	g				
	6. Week	Computer Applications – Beam and Frame System Modeling						
	7. Week	2-D Elasticity Problems						
Weekly Schedule	8. Week	Midterm exam						
	9. Week	Meshing and Mesh Optimisa	ation					
	10. Week	Meshing and Mesh Optimisa	ation					
	11. Week	Plate and Shell Analysis						
	12. Week	3-D Elasticity Problems						
	13. Week	Design Optimisation						
	14. Week	Failure Analysis						
	15. Week	Overall Review						
	Weekly th	eoretical course hours: 2						
Teaching and Learning Methods	Weekly tu	itorial hours: 1						
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 0						
	Internet bi materials:	rowsing, library work Designi 9	ng and imple	menting				
	Report pro	eparing: 0						
	Preparing	a Presentation: 0						
	Presentati	ons: 0						
	Preparatio	on of Midterm and Midterm E	xam: 2					
	Final Exa	m and Preparation for Final E	xam: 3					
			Numbers	Total Weightin g (%)				
	Midterm Exams140							
	Assignment 2 20							
	Projects		۷	20				
Assessment Criteria	Practice							
	Quiz							
	Percent of In-term Studies 60							
Source (70)								
-------------								

		Activity	Total Number of Weeks	Duration (weekly hour)		Total Period Work Load
	Weekl	y Theoretical Course	14	2		28
		y Tutorial Hours	14	1		14
	Readir	ng Tasks				
		s	1	3		3
	Materi	al Design and	2	3		6
	Report	Preparing				
Workload	Prepar	ing a Presentation				
	Presen	tations				
	Midter Preper Midter	m Exam and ation for m Exam	1	2		2
	Final H	Exam and	1	3		3
	Preper Other	ation for Final Exam	1			
	be emp	phasized)				
	Total V	Workload	-	-		56
	Total V	Workload / 25				56/25
	Course	e Credit (ECTS)				2
	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 pertai to the relevant discipline; ability to use theoretical an applied information in thes areas to model and solve engineering problems.			X		
	2	Ability to identify, for and solve complex er problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this	x		
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		х	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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.		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.			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.		X		
The Course's Lecturer(s) and Contact Informations		Doç. Dr. Hüseyin Kürşad SEZ kursadsezer@gazi.edu.tr	ER			

Course Description Form						
Course Code and Name	ETM-404 DESIGN PROJECT MANAGEMENT					
Course Semester	7-8					
Catalog Content	Students learn the concept of project management. Have an idea about how project management will be realized in design					
Textbook	Ramroth, W.G., Project Management for Design Professionals, AEC Ed., Int. Ed., 2006. Santos, J. M. D., Project Management Absolute Beginner's Guide, 2012 by QUE Publishing					
Supplementary Textbooks	Kerzner, H., Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 2013.					
Credit	4 AKTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	To learn design project management topics and methods, to gain the ability to apply. To ensure that human and physical resources are brought together to produce results that will achieve a specific goal within a given time and budget.					
Course Learning Outcomes	<ol> <li>Students who attend this course learn basis of design project management.</li> <li>They can make better design project management based on scientific bases.</li> </ol>					
Instruction Methods	Face to face Practical training					

	1.	Introduction and basic cond	cepts						
	Week	A short history of project and design management							
	Week	T short instory of project a	na acsign mai	lagement					
	3.	3. Project management goals and activities							
	Week								
	4. Week	The design firm and projec	t management	ţ					
	5.	Characteristics of a good p	roject manage	r					
	Week								
	6. Week	Planning the project							
	7.	Project risk management							
Weekly Schedule	Week	Construction cost control							
	o. Week	Construction cost control							
	9.	Design budget control							
	Week	Project schedule control							
	Week								
	11.	Project team and client man	nagement						
	Week								
	12. Week	Project quality control							
	13.	Project management rules of thumb and checklist							
	Week								
	Week	eek							
	Weekly th	eoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	torial hours: 0							
(These are examples Please fill which	Reading A	Activities: 5							
activities you use in the course)	reading r								
	Internet bi	rowsing, library work Design	ing and imple	ementing					
	materials.	7							
	Report pre	eparing: 8							
	Preparing	a Presentation: 6							
	Presentati	ons: 6							
	1 resentativ	0115. 0							
	Preparatio	n of Midterm and Midterm I	Exam: 3						
	Final Exa	m and Preparation for Final I	Exam: 4						
	Numbers Total								
				yveightin g (%)					
	Midterm	Exams	1	30					
	Assignm	ent							
	Application 20								
Assessment Criteria	Practice 1 30								
	Quiz								
	Percent of In-term Studies 60								
	(%) Percento	ge of Final Exam to Total		40					
	Score (%	ge of Final Exam to Total		40					

Attendance	
	<u>.</u>
-	

	Activity	Number of Weeks	(weekly hour)	Period Work Load
We Ho	eekly Theoretical Course	14	2	28
We	eekly Tutorial Hours			
Rea	eading Tasks	8	2	16
Stu	udies	2		
		4		
		2	5	10
Workload		1	5	10
		1		
Ma Im	aterial Design and plementation	1	2	2
Re	port Preparing	2	8	16
Pre	eparing a Presentation	2	6	12
Pre	esentations	1	4	4
Pre	eperation for idterm Exam	2	2	4
Fin Pre	nal Exam and eperation for Final Exam	1	4	4
Oth	her (should	1	4	4
Tot	otal Workload			
Tot	otal Workload / 25			100/25
Со	ourse Credit (ECTS)			4
N	No Program Outcom	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 theoreti applied information i areas to model and so engineering problem	in and pertaining line; ical and n these plve s.	X	
	2 Ability to identify, for and solve complex en problems; ability to s apply proper analysis modeling methods for purpose.	x		
	3 Ability to design a consystem, process, deviation product under realist constraints and condisting a way as to mee desired result; ability modern design method purpose.	omplex ice or ic itions, in t the to apply ods for this	x	

4	Ability to develop, select and use modern techniques and tools necessary for analysis and solution of complex problems in engineering applications; ability to use information technologies effectively.				X	
5	Ability to design and conduct experiments, gather data, analyze and interpret results for examination of engineering problems or discipline-specific research topics.			x		1
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.				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.			x	
	15	Knowledge about awareness of the legal consequences of engineering solutions.		X		
The Course's Lecturer(s) and Contact Informations	1.	Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr				

Course Description Form						
Course Code and Name	ETM 410 Senior Thesis					
Course Semester	7-8					
Catalog Content	Determination of senior thesis subject. Literature review regarding the selected subject and collecting necessary information. Writing the thesis after determining the information to be included in the thesis. Presentation of the thesis in front of a group. Preparing and submitting the thesis.					
Textbook	<ul> <li>Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006.</li> <li>Morris, R., Fundamentals of Product Design, AVA Pub., 2009.</li> </ul>					
Supplementary Textbooks	- Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.					
Credit	3 AKTS					
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements					
Type of the Course	Obligatory					
Instruction Language	Turkish					
Course Objectives	To be able to do research on a subject, write and present the result. Presenting and defending a wide range of scientific researches and examinations that may be carried out in selected areas of interest in Industrial Design Engineering in a theoretical report prepared in accordance with the principles of departmental assignment.					
Course Learning Outcomes	To have comprehensive information about a matter, to write and to present.					
Instruction Methods	Practical training					

	1. Determination of senior thesis subject							
	2.	Literature review						
	<u>wеек</u> 3.	Literature review regardir	ng the selected	l subject (continue)				
	Week 4.	Literature review regardir	ng the selected	l subject (continue)				
	Week 5.	Literature review regarding the selected subject (continue)						
	Week	Collecting passage info	mation					
	o. Week	Conecting necessary into	mation					
	7. Week	Collecting necessary infor	rmation (conti	nue)				
Weekly Schedule	8. Week	Collecting necessary infor	rmation (conti	nue)				
·	9. Week	Writing the thesis after de	etermining					
	10. Week	Writing the thesis after de to be included in the thesi	etermining the is (continue)	information				
	11. Week	information						
	12. Week	Writing the thesis after de to be included in the thes	etermining the sis (continue)	information				
	13.Presentation of the thesisWeek							
	14.Last editing and submitting of the thesisWeek							
	Weekly theoretical course hours: 0							
Teaching and Learning Methods	Weekly ti	utorial hours: 2						
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 10						
	Internet b implemen	rowsing, library work Designing materials: 3	gning and					
	Report pr	eparing: 1						
	Preparing	a Presentation: 1						
	Presentati	ions: 1						
	Preparatio	on of Midterm and Midterm	n Exam: 0					
	Final Exa	m and Preparation for Fina	l Exam: 10					
	Numbers Total Weightin g (%)							
	Midtern	n Exams						
	Applica	tion						
Assessment Criteria	Projects Practice		1	60				
	Quiz							
	Percent (%)	of In-term Studies		60				
	Percenta	age of Final Exam to	1	40				

Total Score	(%)		
Attendance			
		·	

		Activity	Total Number of Weeks	Dur (we hou	ratio ekly ır)	n		Total Period Work Load
	Weekly	y Theoretical Course						
	Weekly Tutorial Hours		14		2			28
	Readin	ıg Tasks	7		1			7
	Studies	8	5		2			10
		al Design and	5		2			10
		Preparing						
Workload	Prepar	ing a Presentation	1		5			5
	Presen	tations	1		5			5
	Midter Preper Midter	m Exam and ation for m Exam	1		5			5
	Final E	Exam and	1		5			5
	Other (	should						
	be emp	bhasized)						
	Total V	Workload						75
	Total Workload / 25							3
	Course	Program Outcom	nes.					3
	No		105	1	2 3	4	5	
Contribution Level Between Course Learning Outcomes and Program Outcomes	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.						x	
	2	Ability to identify, for and solve complex er problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this				x	
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this				x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.				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.		х		
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.		x	
The Course's Lecturer(s) and Contact Informations	Pr rb	of. Dr. Hüseyin Rıza BÖRKLÜ oorklu@gazi.edu.tr			

Course DescriptionForm						
Course Code and Name	ETM 412 Entrepreneurship					
Course Semester	7-8					
Catalog Content	Business Intellectual Development and Creativity, Business Plan Concepts and Elements (Market Research, Marketing Plan, Production Plan, Management Plan, Financial Plan), Issues to be Considered in Writing and Presenting Business Plan, Workshops, Support to Training Program Modules					
Textbook	<ol> <li>Gerber, M.E, Girişimcilik Tutkusu, Sistem Yayıncılık, 2011.</li> <li>Kolektif, Girişimcilik, Beta Basım Yayım, 2013.</li> <li>Atasoy, T., Kendinizin Patronu Olmak: Girişimcilik, ODTÜ Geliştirme Vakfi Yay., 2009.</li> </ol>					
Supplementary Textbooks						
Credit	3 ECTS					
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 AttendanceRequirements					
Type of the Course	Compulsory					
Instruction Language	Turkish					
Course Objectives	The aim of the course is to instill awareness of entrepreneurship, to recognize the problems encountered in daily life might even be a business idea, to encourage young people to start their own business, to enable them to do their feasibility studies by transforming their business ideas and business plans.					
Course Learning Outcomes	Students can develop your own business ideas, prepare and present a business plan,work about e-commerce, logistics, foreign trade etc.					
Instruction Methods	Expression					

	1. The Basic Concepts and The Importance of Entrepreneurship								
	2. Week	Business Idea Development	and Creativit	ty Exercises					
	3. Week	Business Idea Development	and Creativit	ty Exercises					
	4. Week	Concept And Elements of A	Business Pla	n					
	5. Week	Market Research							
	6. Week	Marketing Plan, Production	Plan						
	7. Week	Management Plan							
Weekly Schedule	8. Week	Midterm exam							
	9. Week	Financial Plan							
	10. Week	Cautions For Writing and Pr Plan	esentation of	The Business					
	11. Week	Marketing will doing service	e production,	commerce					
	12. Week	Tourism, education and voca	ational job op	pinions					
	13. Week	New entrepreneur fields. Ent competetive at entrepreneur	trepreneurshi	p policies,					
	14. Week	Reorganising on small and n at global rivals	nedium sizes	es enterprises					
	15. Week	Problems and solvings of en	trepreneurshi	ip and business					
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly tu	atorial hours: 0							
(These are examples. Please fill which	Reading A	Activities: 0							
ucuvines you use in the course)	Internet bi materials:	rowsing, library work Designin 0	ng and imple	menting					
	Report pro	eparing: 0							
	Preparing	a Presentation:45							
	Presentati	ons: 0							
	Preparatio	on of Midterm and Midterm Ex	kam: 0						
	Final Exa	m and Preparation for Final Ex	kam: 0	Total					
			Numbers	Weightin g(%)					
	Midterm Assignm	n Exams	1	40					
	Applicat Projects	ion	1	20					
Assessment Criteria	Practice								
	Quiz Percent (%)	of In-term Studies		60					

Percentage of Final Exam to Total Score (%)	1	40
Attendance		

		Activity	Total Number of Weeks	D (w ho	ura vee our	atio kly ')	n		Total Period Work Load
	Weekly Hours	y Theoretical Course	14			2			28
		y Tutorial Hours		╞					
		ng Tasks		L					
		S	4			3			12
		al Design and							
	Report	Preparing	1	┢		3			3
Workload	Prepar	ing a Presentation	3	L		6			18
	Presen	tations	2			5			10
	Midter Preper Midter	m Exam and ation for m Exam	1			2			2
	Final F	Exam and ation for Final Exam	1			2			2
	Other (	( should	-	$\vdash$		-			_
	be emp	phasized)		_					75
	Total V	Workload	-	┝		-			/5
	Course	e Credit (ECTS)		╞					3
	NT	Program Outcom	nes	1	2	n	А	E	-
Contribution Level Between Course Learning Outcomes and Program Outcomes	2	e in e and pertaining bline; ical and in these olve s. prmulate, ngineering select and			x	x			
		modeling methods for purpose.	or this						
	3	Ability to design a co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this			X			
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.					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.				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.			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.       x
The Course's Lecturer(s) and Contact Informations	Department Management
	tasarım@gazı.edu.tr

Course Description Form							
Course Code and Name	ETM 414 Product Design-V						
Course Semester	7-8						
Catalog Content	Introduction, Choosing the project of a complex and real industrial design (in collaboration with industrial firms), Conducting a literature review and preparing its requirements list, Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.), Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach), Making its prototypes and tests, Preparing its handbook and user's manual, Writing a report and preparing its presentations and then presenting it in the classroom (the project will be assessed by experts coming from university and industrial firms together).						
Textbook	Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006. Morris, R., Fundamentals of Product Design, AVA Pub., 2009.						
Supplementary Textbooks	Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.						
Credit	3 Credit / 6 AKTS						
Prerequisites of the Course ( Attendance Requirements)	ETM 406 Product Design-IV - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	Teaching topics and rules of graduation project and thesis, gaining capabilities for its applications. After preparing free hand drawings of this idea, three dimensional modeling in computer-aided programs and product prototyping with various production techniques.						
Course Learning Outcomes	<ol> <li>Students who attend this course learn topics and methods of project preparation.</li> <li>They can prepare a complex and real project.</li> </ol>						
Instruction Methods	Face to face Practical training						

	1. Week	Introduction							
	2. Week	Choosing the project of a coordination design (in collaboration with	omplex and the industrial	real industrial firms)					
	3. Week	Conducting a literature revi requirements list	iew and prep	aring its					
	4. Week	4. Preparing its calculations, analysis, designs and sketch (according to aesthetics/ ergonomics/technologic etc.)							
	5. Week	Continuing the work condu	cted previou	s week					
	6. Week	Preparing its computer-aide analysis and animations (ac	ed calculation cording to s	ns, models, ystematic appr	oach)				
	7. Week	Continuing the work condu	cted previou	s week					
Weekly Schedule	8. Week	Continuing the work condu	cted previou	s weeks					
	9. Week	Making its prototypes and t	tests						
	10. Week	Making its prototypes and t	tests						
	11. Week	Reorganizing and revising tresults of prototype tests	the design ac	cording to the					
	12. Week	Making its prototypes and tests							
	13. Week	Preparing its handbook and user's manual							
	14. Week	Writing a report and prepar presenting it in the classroo assessed by experts coming firms together)	ring its prese om (the proje g from univer	ntations and the ct will be rsity and indus	ien trial				
	Weekly th	neoretical course hours: 2							
Teaching and Learning Methods	Weekly tı	itorial hours: 1							
(These are examples. Please fill which activities you use in the course)	Reading A	Activities: 2							
•	Internet b implemen	rowsing, library work Design ting materials: 3	ning and						
	Report pr	eparing: 1							
	Preparing	a Presentation: 1							
	Presentati	ons: 1							
	Preparatio	on of Midterm and Midterm I	Exam: 10						
	Final Exa	m and Preparation for Final I	Exam: 10						
			Numbers	Total Weightin g (%)					
	Midtern	n Exams	1	20					
	Assignm Applicat	tion	2	20					
Assessment Criteria	Projects		1	20					
	Practice								
	Quiz		Quiz						

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

Workload F M F S M I F M F M F M F M F M F M F C B		Activity	Total Number of Weeks	Durati (weekl hour)	Total Period Work Load		
	Weekl	y Theoretical Course	14	2	2		28
	Weekl	y Tutorial Hours	14	1	1		14
Workload Contribution Level Between Course Learning Outcomes and Program Outcomes		ng Tasks					
	Studie	S	6	3	3		18
	Materi	al Design and					
	Report	Preparing				_	
Workload	Prepar	ing a Presentation	3	3	3		9
	Presen	tations					
	Midter Preper Midter	m Exam and ation for m Exam	1	2	2		2
	Final I	Exam and	1	4	1		4
	Preper Other	ation for Final Exam					
	be emp	phasized)					
	Total V	Workload	-	-	-		75
	Total V	Workload / 25					75/25
	Course	e Credit (ECTS)					3
	No	Program Outcom	ies	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 discip ability to use theoret applied information areas to model and sc engineering problem	e in e and pertaining oline; ical and in these olve s.		x		
		2 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 co system, process, dev product under realist constraints and cond such a way as to mee desired result; ability modern design metho purpose.	omplex ice or ic itions, in et the v to apply ods for this		x		
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation rely.		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 in 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.		2	ĸ		
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.		X	
The Course's Lecturer(s) and Contact Informations	Pr rb	of. Dr. Hüseyin Rıza BÖRKLÜ oorklu@gazi.edu.tr			

Course Description Form							
Course Code and Name	ETM 408 COMPUTER AIDED MANUFACTURING (CAM)						
Course Semester	7-8						
Catalog Content	DNC, CIM. Programming techniques using dialog method. Programming of CNC lathes and milling machines by dialog method.						
Textbook	M., Gülesin, A., Güllü, Ö., Avcı, G., Akdoğan, CNC Torna ve Freze Tezgahlarının Programlanması, Asil Yay., Ankara, 2005. Gülesin, M., Güllü, A., Avcı, Ö, SINUMERIK Kontrol Sistemi İle Torna ve Frezelerin Programlanması, Asil Yay., An, 2007.						
Supplementary Textbooks	Mattson M., CNC Programming: Principles and Applications, Delmar Publishers, USA, 1998. Smid, P., CNC Programming Handbook, Second Edition, ISBN: (0-8311-) 3134-9 2003						
Credit	5 AKTS						
Prerequisites of the Course ( Attendance Requirements)	No Prerequisites - %70 Attendance Requirements						
Type of the Course	Compulsory						
Instruction Language	Turkish						
Course Objectives	To make macro programming, to write CNC programs with dialogue method.						
Course Learning Outcomes	Being able to make macro programs and write programs with dialogue method.						
Instruction Methods	Face to face Practical training						

	1. Week	CNC programming techniq dialog programming techni	lues, programi ques	ming through								
	2. Week	2. Macro programming Week										
	3. Week	Machine parameters										
	4. Week	DNC and CIM systems										
	5. Week	Programming of cylindrica	l, taper turning	g, grooving and ng on CNC a lat	he							
	6. Week	6. Programming of drilling operations with dialog Week programming on CNC a lathe										
	7. Week	7. Programming of threading, cylindrical turning cycle w dialog programming on CNC a lathe										
Weekly Schedule	8. Week	Programming of facing, pro with dialog programming of	ofile repeating on CNC a lath	g turning cycles								
	9. Week	l drilling cycles										
	10. Week	Programming of inner oper on CNC a lathe	ations with di	alog programmir	ng							
	11. Week	Programming of face, slot with dialog programming of	milling and dr on CNC a mill	illing operations ing machine								
	12. Week	Programming of contour and profile milling operations with dialog programming on CNC a milling machine										
	13. Week	Programming of threading operations with dialog programming on CNC a milling machine										
	14. Week	Programming of pocket mi programming on CNC a m	lling operation	ns with dialog								
	15. Week	Explaining how to use the definitions	simulation pro	ogram for dialog								
	Weekly th	neoretical course hours: 2										
Teaching and Learning Methods	Weekly tu	itorial hours: 1										
(These are examples. Please fill which	Reading A	Activities: 10 rowsing library work Design	ning and imple	ementing								
activities you use in the course)	materials:	20	ing and impre	linenting								
	Report pro	eparing: 0										
	Preparing	a Presentation: 0										
	Presentati	ons: 0										
	Preparatio	on of Midterm and Midterm I	Exam: 3									
	Final Exa	m and Preparation for Final l	Exam: 5									
			Numbers	Total Weightin								
	Midterm	n Exams	1	<b>g</b> (70) 40								
	Assignm Applicat	ient	1	20								
Assessment Criterie	Projects											
	Practice											
	Percent (%)	of In-term Studies	<u></u>	60								
	/			·								

Percentage of Final Exam to Total	40
Attendance	

		Activity	Total Number of Weeks	Fotal umberDuration (weekly hour)				
	Weekly	y Theoretical Course	14		2			28
		y Tutorial Hours	14		1			14
		Reading Tasks			5			20
		8	4		5			20
	Materi	al Design and	4		5			20
	Report	Preparing						
Workload	Prepar	ing a Presentation						
	Presen	tations						
	Midter Preper Midter	m Exam and ation for m Exam	1		3			3
		Exam and ation for Final Exam	1		5			5
		(should bhasized)	3		5			15
		Workload	-		-			125
	Total V	Workload / 25						125/25
	Course	Credit (ECTS)						5
	No	Program Outcom	nes	1 2	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.				x		
		Ability to identify, for and solve complex en problems; ability to s apply proper analysis modeling methods for purpose.	ormulate, ngineering select and s and or this			x		
		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.					x	
	4	Ability to develop, so use modern techniqu tools necessary for a solution of complex in engineering applic ability to use informa technologies effectiv	elect and es and nalysis and problems cations; ation ely.				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.		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.			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.		Х		
The Course's Lecturer(s) and Contact Informations		Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr				