Course Description Form	
Course Code and Name	**ETM 228 - Perspective**
Course Semester	4
Catalog Content	Introduction (description and importance of perspectives), Axonometric projection and its types, Isometric drawing and related applications, Dimetrtic drawing and related applications, Trimetric drawing and related applications, Oblique projection and its types, Cavalier drawing and related applications, Cabinet drawing and related applications, Bird's eye view drawing and related applications, One-point perspective and related applications, Two-point perspective and related applications, Three-point perspective and related applications, Drawing shadow in perspective.
Textbook	-Çetinkaya, S., Teknik Perspektif, Ankara, 1995. -Çaylak, A., Bilgi ve Uygulama Yaprakları-I, Ankara, 2005. -Börklü, H.R. web sitesi.
Supplementary Textbooks	Ali Pancarcı / M.Emin Öcal -„Yapı Teknik Resmi" , -Harbi Hotan -Mimari Perspektif ve Gölge" , YEM Yayın, İstanbul, 3.Baskı , 1999 -Esen Onat -„Perspektif ve Perspektifde Gölge Çizimi" , -Francis D.K.Ching -„Mimarlık ve SanattaYaratıcı Bir Süreç Çizim" , Çev.: Çelen Birkan , YEM Yayın -Francis D.K. Ching with Steven P. Juroszek -„Desing Drawing", John Wiley&Sons, Inc. New York, 1998 -Jose M. Parramon -„Çizim ve Resim Sanatı" , Remzi Kitabevi , İstanbul, 2.Baskı , 1995
Credit	3 ECTS
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	The course also builds on capability of transferring the spatial depth, a result of illusion, and of using line, form and textures in a certain order in pictorial images formed by benefiting from perspective rules.
Course Learning Outcomes	1.Students who attend this course learn topics and methods of perspective. 2.They can draw basic perspective drawings.
Instruction Methods	Practice, Face to face.

Weekly Schedule

1. Week	Introduction (description and importance of perspectives)
2. Week	Axonometric projection and its types
3. Week	Isometric drawing and related applications
4. Week	Dimetrtic drawing and related applications
5. Week	Trimetric drawing and related applications
6. Week	Oblique projection and its types
7. Week	Cavalier drawing and related applications
8. Week	Cabinet drawing and related applications
9. Week	Bird's eye view drawing and related applications
10. Week	Conical perspective projection and its types
11. Week	One-point perspective and related applications
12. Week	Two-point perspective and related applications
13. Week	Three-point perspective and related applications
14. Week	Drawing shadow in perspective

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours:0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 0

Preparing a Presentation: 45

Presentations: 0

Preparation of Midterm and Midterm Exam: 0

Final Exam and Preparation for Final Exam: 0

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application	1	20
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies			
Material Design and Implementation			
Report Preparing			
Preparing a Presentation	7	3	21
Presentations	6	3	18
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)	-	-	-
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.			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	Department Management tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 230 – SEMIOLOGY AND SEMANTICS IN DESIGN**
Course Semester	4
Catalog Content	Introduction and general description, The semiotic characteristics of design objects, Semiotic analysis process of industrial products, The conceptual prerequisites of product semantics, Relations between mental world and real world and the representation of product type, Concept of product, external appearance of the product, The content of the product image. Knowledge related to product, meaning of design, Functional, semantic structure of man-object-society system, Special content of concepts related to knowledge acquisition, meaning and representation. Product semantic profile, Structure in regard to semantics of the product image, firm image, user cultural group, Expressiveness in the design process and the forms of expressions. Context of products and typologies, Objects readability and its rules. Designing behaviour depending on the product semantics, Semantics analysis of elements of form. Semantics analysis of product external appearance, Semantic explanation of design behaviour, theories, tendencies and styles.
Textbook	Hjelm, S.I., Semiotics in Product Design, Technical Report, Royal Institute of Technology, Stockhom, Sweden, 2002. Krippendorff, K. (2005). The semantic turn: A new foundation for design. crc Press.
Supplementary Textbooks	Silverman, K., The subject of Semiotics, New York: Oxford University Press, 1983
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Selective
Instruction Language	Turkish
Course Objectives	To learn the subjects of sign and semantics in design, to gain the ability to apply, to understand the effect of indicators on the user and to understand the methodology of semantics, to gain the ability to apply in design
Course Learning Outcomes	1. Students attending this course learn basis of semiology and semantics in design. 2. They can apply rules and methods of this course while making designs.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction and general description.
2. Week	The semiotic characteristics of design objects.
3. Week	Semiotic analysis process of industrial products.
4. Week	The conceptual prerequisites of product semantics.
5. Week	Relations between mental world and real world and the representation of product type.
6. Week	Concept of product, external appearance of the product.
7. Week	The content of the product image. Knowledge related to product, meaning of design.
8. Week	Functional, semantic structure of man-object-society system.
9. Week	Special content of concepts related to knowledge acquisition, meaning and representation. Product semantic profile.
10. Week	Structure in regard to semantics of the product image, firm image, user cultural group.
11. Week	Expressiveness in the design process and the forms of expressions. Context of products and typologies.
12. Week	Objects readability and its rules. Designing behaviour depending on the product semantics.
13. Week	Semantics analysis of elements of form. Semantics analysis of product external appearance.
14. Week	Semantic explanation of design behaviour, theories, tendencies and styles.

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 10

Internet browsing, library work Designing and implementing

materials: 20

Report preparing: 10

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	10
Application		
Projects	1	10
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	4	5	20
Material Design and Implementation	4	5	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	Function and personality
3. Week	What influences product design
4. Week	Design and designing
5. Week	Multi-dimensional materials
6. Week	Shaping, joining and surfaces
7. Week	Midterm exam
8. Week	Form follows materials
9. Week	Applications
10. Week	A structure for material selection
11. Week	Cases studies in material and design
12. Week	Making designs which are compatible in terms of form, material and function
13. Week	New materials – the potential for innovation
14. Week	Applications

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 12

Internet browsing, library work Designing and implementing materials: 23

Report preparing: 10

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	10
Application	2	10
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	2	6	12
Studies	2	4	8
Material Design and Implementation	3	5	15
Report Preparing	3	2	6
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload			75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

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

Weekly Schedule	**1. Week**	Introduction to graphics
	2. Week	Curves
	3. Week	Transformations
	4. Week	Coordinate-free geometry
	5. Week	3D objects
	6. Week	Camera models
	7. Week	Visibility
	8. Week	Basic lighting and reflection
	9. Week	Shading
	10. Week	Texture mapping
	11. Week	Basic ray tracing, radiometry and reflection
	12. Week	Distribution ray tracing, interpolation
	13. Week	Parametric curves and surfaces
	14. Week	Animation

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment	1	10
Application		
Projects	1	20
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	3	5	15
Material Design and Implementation	3	6	18
Report Preparing			
Preparing a Presentation	1	4	4
Presentations	1	3	3
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction (description and importance of descriptive geometry)
2. Week	Traces
3. Week	Traces of lines
4. Week	Traces of planes
5. Week	Piercing points
6. Week	Intersections between planes
7. Week	Parallelism and perpendicularity
8. Week	Tilting
9. Week	Affinity and collineation
10. Week	Tangentes
11. Week	Vector opeartions
12. Week	Projections based on elevation
13. Week	Shadow and shadowing
14. Week	General applications

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment	1	10
Application		
Projects	1	20
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	3	6	18
Material Design and Implementation	2	5	10
Report Preparing	1	6	6
Preparing a Presentation	2	2	4
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	ETM 238 Portfolio Design
Course Semester	4
Catalog Content	A portfolio design course is a course for the theoretical and practical knowledge of preparing printed or digital documents for professional business or academic life applications. Graphic, Logo, Corporate identity, Learning of Illustrator program and application for digital portfolio, Digital and printed portfolio design, Resolution, Printing varieties
Textbook	Markowitz, H. M. (1991). Foundations of portfolio theory. The journal of finance, 46(2), 469-477.
Supplementary Textbooks	Rea, D. (2011). English Unlimited B1+-Intermediate/Coursebook with E-Portfolio
Credit	2 Credit / 3 AKTS
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To prepare the printed and online portfolios that will facilitate the entry of the students into the professional business life, t to acquire knowledge and skills about portfolios and the Illustrator visualization program.
Course Learning Outcomes	1. Getting information about portfolio 2. Ability to use the Illuminator program 3. Ability to design printed and digital portfolio 4. Learning of graphic design and digital design principles
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Portfolio Design, how it works with samples
2. Week	Compiling works that they can put on their portfolio, evaluation
3. Week	Establishment and evaluation of corporate identity for portfolio design
4. Week	Clarification of logo design and corporate identity design by sketch
5. Week	Creating their own digital Portfolio layout - Detailing
6. Week	Information about the illustrator program - introduction – basic commands
7. Week	Teaching the illustrator program - submenu - practice
8. Week	Continuing to teach the illustrator program – creating graphics - application
9. Week	Graphic Application (Corporate Identity and Poster)
10. Week	Continuing to teach the illustrator program – Digital creation of corporate identity
11. Week	Continuing to teach the illustrator program – Begin to create digital portfolios
12. Week	Applying Digital Portfolios
13. Week	Completion of Digital Portfolio
14. Week	Giving and applying the theoretical information for the printed portfolio

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 5

Preparing a Presentation: 5

Presentations: 5

Preparation of Midterm and Midterm Exam: 5

Final Exam and Preparation for Final Exam: 5

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application	2	20
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	5	2	10
Studies	5	2	10
Material Design and Implementation	7	1	7
Report Preparing			
Preparing a Presentation	5	1	5
Presentations	5	1	5
Midterm Exam and Preperation for Midterm Exam	1	5	5
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload			75
Total Workload / 25			3
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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. İsmail Şahin isahin@gazi.edu.tr							

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

Weekly Schedule

1. Week	Basic Principles of Medical Devices and system components
2. Week	Electrical and mechanical devices used in medicine groups
3. Week	Minimally invasive medical device design
4. Week	Design of devices for bedside diagnostic technology
5. Week	Design of devices for bedside diagnostic technology
6. Week	Design of devices for measuring patient radiation dose
7. Week	Sensor, biosensor technologies
8. Week	Sensor, biosensor technologies
9. Week	The design of home health care and patient monitoring devices
10. Week	Portable diagnostic and therapeutic devices
11. Week	Portable early diagnosis devices
12. Week	Micro total analysis systems
13. Week	Integrated bio-chips (Lab on a chip)
14. Week	Application
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	5	3	15
Studies	6	2	12
Material Design and Implementation	4	4	16
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	2	2
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.			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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction to Machatronics System Design
2. Week	The design processes
3. Week	Block diagrams, Manipulations and Simulation
4. Week	Electrical, mechanical and fuid systems and systems coupling
5. Week	Sensors and transducers
6. Week	Sensor Applications
7. Week	Actuating devices
8. Week	System Control – Logic Methods
9. Week	Programmable Logic Controllers
10. Week	Signals, Systems and Controls
11. Week	Laplace Transfor Solutions of Ordinary Differential Equations
12. Week	Signal Conditioning and Real time interfacing
13. Week	Data Conversion Process
14. Week	Case Studies
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 6

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		

Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)	1	40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	3	3	9
Studies	5	2	10
Material Design and Implementation	4	5	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					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 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.				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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	The scope of the furniture and discussion in general
2. Week	Structural classification of furniture
3. Week	Basic features describing a furniture: Structure, Format, Material, Measurement, Surface
4. Week	Systematic forming in furniture design: Structure variables, Shape variables
5. Week	Format search, Synthesis format: Structure and Shape variables, Factors affecting the format indirectly
6. Week	Product synthesis and problem analysis
7. Week	Format search according to general material properties
8. Week	Identity and personality problems in furniture
9. Week	The material conditions encountered in the design of furniture: General characteristics of Material – Form, Form - Material relations, Production methods - Design and material relations
10. Week	Discussion and analysis of Furniture in terms of Human-element relations: Spread of body height according to seating positions in sitting elements, The spine angles relative to the human body position, Seating elements Height - Angle - Area relations
11. Week	Functions in furniture design and function dressing: Practical Functions, Symbolic Function, Aesthetic Function
12. Week	Literal values in furniture design, changing behaviors
13. Week	Furniture - Furniture relations
14. Week	The scope of the furniture and general discussions

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2
Weekly tutorial hours: 0
Reading Activities: 8
Internet browsing, library work Designing and implementing materials: 25
Report preparing: 6
Preparing a Presentation: 0
Presentations: 0
Preparation of Midterm and Midterm Exam: 3
Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application		
Projects	2	20
Practice		
Quiz		

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	2	3	6
Studies	3	5	15
Material Design and Implementation	2	5	10
Report Preparing	2	3	6
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	5	5
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	The design of product components.
3. Week	Evaluation of product components in terms of mechanical design.
4. Week	Materials and material selection.
5. Week	Standard parts and fasteners.
6. Week	Manufacturing technologies.
7. Week	Mechanical and electro-mechanical mechanisms.
8. Week	Assembly methods.
9. Week	Processes to change the components' physical properties and appearance.
10. Week	Quality control methods.
11. Week	The influence of the chosen manufacturing method and material upon design.
12. Week	Factors influencing the manufacturing method choices.
13. Week	Systems for controlling design and manufacturing methods.
14. Week	Design examples.

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 10

Internet browsing, library work Designing and implementing

materials: 23

Report preparing: 5

Preparing a Presentation:

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application		
Projects	2	20
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	2	4	8
Studies	3	5	15
Material Design and Implementation	2	6	12
Report Preparing	1	5	5
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	76
Total Workload / 25			76/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 324 - Cost-Efficient Design**
Course Semester	5-6
Catalog Content	Introduction, Cost Responsibility of the Product Developers, Cost Management for Product Development, Methodology and Organization of Cost Management for Product Development, Applications, Influencing the Lifecycle Costs, Influencing the Total Costs, Factors that influence Manufacturing Costs and Procedures for Cost Reduction, Fundamentals of Cost Accounting for Product Development, Early Identification of Costs during Product Development – Development-Concurrent Cost Calculations, A general design example.
Textbook	1. Ehrlenspiel, K., Kiewert, A. and Lindemann., U, Cost-Efficient Design, Springer Pub., Int. Ed., 2007. 2. Kamm L.J., Designing Cost-Efficient Mechanisms, McGraw Hill Pub., Int. Ed., 1990.
Supplementary Textbooks	1. Research in Engineering Design 2. Int. Journal of Computer-Aided Engineering
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Determination of economic design criteria, role and importance of cost in design criteria, learning price performance evaluation analysis
Course Learning Outcomes	1. Students who attend this course learn basis of cost-efficient design. 2. They can make better, cheaper and more efficient desigs by using knowledge gained in this course.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Cost responsibility of the product developers
3. Week	Cost management for product development
4. Week	Methodology and organization of cost management for product development
5. Week	Applications
6. Week	Influencing the lifecycle cost
7. Week	Influencing the total costs
8. Week	Case study
9. Week	Factors that influence manufacturing costs and procedures for cost reduction
10. Week	Applications
11. Week	Fundamentals of cost accounting for product development
12. Week	Applications
13. Week	Early identification of costs during product development – development-concurrent cost calculations
14. Week	Applications
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 6

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application	1	30
Projects		
Practice		
Quiz		

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	3	2	6
Studies	5	2	10
Material Design and Implementation	4	6	24
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)	14	2	28
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.		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 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.				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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Definition of Supply and Demand
2. Week	Flexibility of Supply and Demand
3. Week	Temporary, short and long periods
4. Week	Individual and market demand, utility theory
5. Week	Introduction to the cost theory
6. Week	Cost Analysis Applications
7. Week	Total, average and marginal costs, fixed and variable costs
8. Week	Companies functional costs
9. Week	Cost - Volume - Profit Analysis
10. Week	Short-and long-term cost analysis
11. Week	Economies of Scale
12. Week	Markets: Perfectly Competitive Markets
13. Week	Monopoly and Imperfect Markets
14. Week	Applications

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 6

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application		
Projects	2	20
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	3	4	12
Material Design and Implementation	4	5	20
Report Preparing	2	3	6
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	5	5
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload	-	-	76
Total Workload / 25			76/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 326 – Plastic Mold Design**
Course Semester	6
Catalog Content	Injection molding, extrusion, blow molding, rotational molding, thermoforming, compression molding technologies for thermoplastiscs and thermosets plastics, Mold manufacturing for plastic parts, and reporting Factory visiting
Textbook	1. Donald V. Rosato Plastics Technology Handbook, Vol. 2 2011 2. D.V. Rosato, Marlene G. Rosato Injection Molding Handbook - 2 Volume Set
Supplementary Textbooks	Plastics manufacturing system engineering, D. Kazmer, 2009.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Giving the fundamental molding technologies for plastic part production. To learn volume mold techniques, production methods and design
Course Learning Outcomes	Learning basic technologies in plastic part manufacturing.
Instruction Methods	Expression

Weekly Schedule

1. Week	Plastic material properties
2. Week	Plastic material properties
3. Week	Considerations in the Design of Plastic Injection Mould Highlights
4. Week	Multiple Should Be Opened Moulds, Moulds Pit and given to Match Angles
5. Week	Distributor Channel type, Input type, Gating Sign
6. Week	Runner Pull Pin, Push Pin Back And Ejector Pins, Cam Systems and Operating Specifications
7. Week	Hot Runner Systems and User's Goals, air ducts
8. Week	Conversion Seals, Brands,
9. Week	Recruitment Available Material Selection
10. Week	The materials used in metal injection molding
11. Week	Comparison of metal injection molding and plastic injection mold
12. Week	The general acteristics of blow molding and extrusion mold
13. Week	The general acteristics of blow molding and extrusion mold
14. Week	Implementation of the Right Mold Heating and Cooling Techniques

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 6

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		

Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)	1	40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	15	2	28
Weekly Tutorial Hours			
Reading Tasks	3	4	12
Studies	5	3	15
Material Design and Implementation	5	2	10
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					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 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.			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	Department Management tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 327 – Sheet Metal Mold Design**
Course Semester	5
Catalog Content	Introduction, Basic die design, Die-work influencing factors, The theory of sheet metal behaviour, Metal stamping dies and their function, Metal stamping dies, their construction, and assembly, Die examples, Metalworking machinery, Blanking and piercing operations, Bending and forming operations, Drawn part examples, Practical die design, Die process quality and maintenance.
Textbook	1. Such, I., Handbook of Die Design, Mc-Graw Hill Pub., 2006. 2. Boljonovic, V., Die Design Fundamentals, Industrai Prss, 2005.
Supplementary Textbooks	1. Research in Engineering Design 2. Int. Journal of Design Engineering
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn the issues of sheet-metal mold design, to gain the ability to apply. In this course, it is aimed to gain the knowledge and skills of making multi-step sheet-metal molds suitable for the technique.
Course Learning Outcomes	1. Students who attend this course learn basis of die design. 2. They can make better sheet-metal die desigs based on knowledge of this course.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction
2. Week	Basic die design
3. Week	Die-work influencing factors
4. Week	The theory of sheet metal behavior
5. Week	Metal stamping dies and their function
6. Week	Metal stamping dies, their construction, and assembly
7. Week	Die examples
8. Week	Metalworking machinery
9. Week	Blanking and piercing operations
10. Week	Blank calculation or flat layout
11. Week	Bending and forming operations
12. Week	Drawn part examples
13. Week	Practical die design
14. Week	Die process quality and maintenance

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application		
Projects	1	20
Practice		
Quiz		
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total Score (%)	1	40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	5	4	20
Material Design and Implementation	2	5	10
Report Preparing	2	5	10
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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			Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr					

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

Weekly Schedule

1. Week	Introduction – History of vehicle architecture in design
2. Week	Design process Overview
3. Week	Functional Objectives, systems and market segments
4. Week	Size and Proportion
5. Week	Interiors and Cargo
6. Week	Powertrains
7. Week	Wheels and tires
8. Week	Suspension and Chassis
9. Week	Bodies
10. Week	Aerodynamics
11. Week	Safety and crash regulations
12. Week	Mobility
13. Week	Design Excercises
14. Week	Case study

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 10

Internet browsing, library work Designing and implementing materials: 24

Report preparing: 8

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment		
Application	2	20
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	2	3	6
Studies	3	4	12
Material Design and Implementation	2	6	12
Report Preparing	2	4	8
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	5	5
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload			76
Total Workload / 25			76/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 341 MECHANISMS**
Course Semester	5
Catalog Content	All machine parts work with different motion. These all types of motin types is important for machine design. And These machine parts have different jobs in the machine. For this aim machine parts and motions and static and dynamic engineering approach is very important.
Textbook	Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley, Mekanizma Tekniği Eres Söylemez Kirschenbaum, M., G., Mechanisms, 2008.
Supplementary Textbooks	Rider, M. J., Design and analysis of mechanisms: a planar approach, 2015.
Credit	2 Credit / 3 AKTS
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn about machine and machine parts is very impartant. Every each parts jobs have been determined very intelligent. Basic of the mechanicsm knowledge defines the defining the mechanisms, analysis of the mechanisms and syntehesis of the mechanisms.
Course Learning Outcomes	1. Know the machine parts and motions 2- Know the engineering design processes 3. To make a design and perform the engineering design pholosophy 4. Know the design procedures
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	General Concepts
2. Week	General Concept and basic mechanisms
3. Week	Definition of Degree of Freedom
4. Week	Definition of Degree of Freedom
5. Week	Classification of mechanisms
6. Week	Kinematic analysis, motion anlysis, velocity anaylsis
7. Week	Kinematic analysis, motion anlysis, velocity anaylsis (3 bar linkage)
8. Week	Kinematic analysis, motion anlysis, velocity anaylsis (4 bar linkage)
9. Week	Grashoff Rules
10. Week	Crank – slider mechanism Biyel curve
11. Week	4 bar linkage mechanism Biyel curve
12. Week	Syntesis of mechanisms (3 bar linkage)
13. Week	Syntesis of mechanisms (4 bar linkage)
14. Week	General Summary

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 3

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	x	40
Assignment	x	10
Application	x	10
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60
Percentage of Final Exam to Total	x	40

Score (%)		
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	4	3	12
Studies	4	3	12
Material Design and Implementation	3	5	15
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					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 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.				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 342 – Ecological Design**
Course Semester	6
Catalog Content	An Introduction to ecological design, Product system life cycle, Ecodesign strategy wheel, Ecodesign ideologies, Emerging strategies, Design for recycling, Ecodesign process tree, Measuring environmental performance, Science in Life Cycle Assessment (LCA), Understanding toxicity, Design ethics – Biotic and social imperatives, Ecology for designers, Evolution of the biosphere, Achieving social equity
Textbook	White, P., Pierre, L., Belletire and S. Okala Practitioner: Integrating Ecological Design, Okala Team, 2013 Van der Ryn, S., Cowan, S., Ecological Design, Tenth Anniversary Edition, Island Press, 2007
Supplementary Textbooks	Melnick, R. (2001). Ecology and design: frameworks for learning. Island Press.
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To provide practical information and methods for designing products and systems with low impact to ecological health and human health. .
Course Learning Outcomes	At the end of this course students will learn systematic ecodesign tools such as Ecodesign Strategy Wheel and life cycle assessment (LCA) and be able to see the wider view and manage a depth of information to steer their design work towards more ecologically responsible designs and ways of living. Eventually students can take holistic system view of products with complete range of environmental impacts over the full cycle, from material extraction to end of life.
Instruction Methods	Face to face

Weekly Schedule

1. Week	An Introduction to ecological design
2. Week	Product system life cycle
3. Week	Ecodesign strategy wheel
4. Week	Ecodesign ideologies
5. Week	Emerging strategies
6. Week	Design for recycling
7. Week	Ecological design process tree
8. Week	Measuring environmental performance
9. Week	Science in LCA
10. Week	Understanding toxicity
11. Week	Design ethics – Biotic and social imperatives
12. Week	Ecology for designers
13. Week	Evolution of the biosphere
14. Week	Achieving social equity

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment	1	10
Application		
Projects	1	20
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score		**40**

(%)		
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	4	2	8
Studies	3	5	15
Material Design and Implementation	2	5	10
Report Preparing	1	7	7
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Prof. Dr. Veysel ÖZDEMİR vozdemir@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 343 – AUTOMATIC CONTROL**
Course Semester	5
Catalog Content	Giriş, Temel kavramlar, açık ve kapalı kontrol çevrimleri, Kazanç, taransfer fonksiyonu, Kontrol çevrimini inceleme ve tasarlama, Laplans dönüşümü, Trasnfer fonksiyonu ve karakteristik fonksiyon, Uygulamalar, Deneysel çalışmalar, Sistem dinamiği, Elektriksel ve mekanik sistem elemanları, Transfer fonksiyonu, blok diyagramı ve işaret akış diyagramı, Denetleyici tipleri, Kapalı çevrim kontrolü.
Textbook	1. Özdağ, N., Dinibütün, A.T., Kuzucu, A., Otomatik Kontrol Temelleri, Birsen Yayı., İstanbul, 1998. 2. Kuo, B.J., Otomatik Kontrol Sistemleri, Literatür Yay., İstanbul, 1999.
Supplementary Textbooks	Raven, F. H., Automatic Control Engineering, 1968.
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Automatic control learn subjects and methods, gain the ability to practice. Give circuit and system concept. To teach the models of physical systems. To find the transfer functions of physical systems. To teach the concept of stability and its criteria. To give methods such as block diagram, signal flow diagram, Bode diagram, Routh-Hurwitz criterion, geometric ground curve of roots. Obtain the mathematical model of a given linear system and to teach the system behavior and stability by using this model. To teach how to do system design.
Course Learning Outcomes	1. Students who attend this course learn basis of automotic control. 2. They can use the knowledge of this course while solving design problems.
Instruction Methods	Face to face

Weekly Schedule	**1. Week**	Introduction
	2. Week	Basic concepts, open and closed control circuits
	3. Week	Gain, transfer funtion
	4. Week	Examination and design of control circuits
	5. Week	The Laplace Transform
	6. Week	Transform function and chacteristic function
	7. Week	Applications
	8. Week	Experimental works
	9. Week	System dynamics
	10. Week	Elemts of electrical and mechanical systems
	11. Week	Transform function, block diagram and sign diagram of a flowchart
	12. Week	Applications
	13. Week	Types of controllers
	14. Week	Experimental works, control of the closed circuits

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application		
Projects	1	30
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	3	5	15
Material Design and Implementation	2	5	10
Report Preparing	2	7	14
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 344 – ENERGY SYSTEMS DESIGN**
Course Semester	6
Catalog Content	Introduction, Piping systems, Applications, Heat exchangers I and II, System simulation, Analysis and modeling of thermal and fluid systems, Evaluation of system performance, Consideration of system economics, System design optimization, A general design example.
Textbook	1. Hodge, B.K. and Taylor, R.P., Analysis and Design of Energy Systems, Prentice Hall Pub., 1999. 2. Tostevin, G.M., Energy Systems Design and Operations: A Unified Method, Prentice Hall Pub., 2011.
Supplementary Textbooks	1. Research in Engineering Design 2. Int. Journal of Design Engineering
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn energy systems design issues, to gain the ability to apply. It is a course that plans, projects, implements, and develops strategies for the use of all kinds of energy in an adequate, high-quality, continuous, low-cost and environmentally compatible manner, and offering and using them economically.
Course Learning Outcomes	1. Students who attend this course learn basis of enegy systems design. 2. They can make better enegy systems desigs based on knowledge of this course.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction
2. Week	Piping systems
3. Week	Applications
4. Week	Heat exchangers I
5. Week	Applications
6. Week	Heat exchangers II
7. Week	Applications
8. Week	Prime movers
9. Week	System simulation
10. Week	Analysis and modeling of thermal and fluid systems
11. Week	Evaluation of system performance
12. Week	Consideration of system economics
13. Week	System design optimization
14. Week	A general design example

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application		
Projects	1	30
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	2	2	4
Studies	3	4	12
Material Design and Implementation	2	5	10
Report Preparing	2	7	14
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 345 – MODELMAKING AND PROTOTYPING-II**
Course Semester	5
Catalog Content	Introduction, Description of advanced modelmaking and giving some examples, Prototyping interactive electronic products, Advanced modelmaking: Principles and choices, health and safety, space and setup, workflow, tools, Adhesives and fillers, Papers and cartons, foamcore, polystyrene foam, Thermoplastic sheet and extruded shapes, polyurethane modelling board, Wood, Modelling clay, casting, Painting and 3D printing, Graphics: Labels and decals, softgoods: Sewn textile products
Textbook	1. Hallgrimsson, B., Prototyping and Modelmaking for Product Design, Laurence King Pub, Int. Ed., 2012. 2. 2.Direct-Write Technologies for Rapid Prototyping Applications : Sensors, Electronics, and Integrated Power Sources
Supplementary Textbooks	1. Journal of Engineering Design 2. Int. Journal of Design Engineering
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To learn advanced models and prototyping methods, to gain the ability to apply. To comprehend the design and production methods of different model patterns. Learning and application of additive manufacturing methods
Course Learning Outcomes	1. Students who attend this course learn basis of modelmaking and prototyping. 2. They can develope advanced level models and prototypes.
Instruction Methods	Face to face

Weekly Schedule	**1. Week**	Introduction
	2. Week	Description of advanced modelmaking and giving some examples
	3. Week	How prototypes are used
	4. Week	Prototyping interactive electronic products
	5. Week	Advanced modelmaking: Principles and choices, health and safety
	6. Week	Advanced modelmaking: Space and setup, workflow
	7. Week	Tools used for modelmaking
	8. Week	Adhesives and fillers
	9. Week	Papers and cartons, foamcore, polystyrene foam
	10. Week	Thermoplastic sheet and extruded shapes, polyurethane modelling board
	11. Week	Wood
	12. Week	Modelling clay, casting
	13. Week	Painting and 3D printing
	14. Week	Graphics: Labels and decals, softgoods: Sewn textile products

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application		
Projects	1	30
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score		**40**

(%)		
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	2	7	14
Material Design and Implementation	2	8	16
Report Preparing	2	5	10
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 346 – DESIGN FOR REVERSE EGINEERING**
Course Semester	6
Catalog Content	Introduction to Reverse Engineering, Methodologies and Techniques for Reverse Engineering–The Potential for Automation with 3-D Laser Scanners, Reverse Engineering–Hardware and Software, Selecting a Reverse Engineering System, Design for Reverse Engineering, Applications, Introduction to Rapid Prototyping, Relationship Between Reverse Engineering and Rapid Prototyping, Reverse Engineering in the Automotive Industry, Reverse Engineering in the Aerospace Industry, Reverse Engineering in the Medical Device Industry, Legal Aspects of Reverse Engineering, Barriers to Adopting Reverse Engineering, A general design example.
Textbook	1. Raja, V. and Fernandes, K.J., Reverse Engineering - An Industrial Perspective, Springer Pub., 2008. 2. Otlo, K. and Wood, K., Product Design Techniques in Reverse Engineernig and New Product Development, Prentics Hall P., 2000.
Supplementary Textbooks	1. Research in Engineering Design 2. Int. Journal of Computer-Aided Engineering
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Selective
Instruction Language	Turkish
Course Objectives	To learn the design steps of Reverse Engineering, to comprehend the usage area and objectives, to use 3D scanner and to gain the ability to apply on the case study
Course Learning Outcomes	1. Students who attend this course learn basis of design for reverse egineering. 2. They can make better, cheaper and more efficient desigs by using knowledge gained in this course.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction to Reverse Engineering
2. Week	Methodologies and Techniques for Reverse Engineering–The Potential for Automation with 3-D Laser Scanners
3. Week	Reverse Engineering–Hardware and Software
4. Week	Selecting a Reverse Engineering System
5. Week	Design for Reverse Engineering
6. Week	Applications
7. Week	Introduction to Rapid Prototyping
8. Week	Relationship Between Reverse Engineering and RP
9. Week	Reverse Engineering in the Automotive Industry
10. Week	Reverse Engineering in the Aerospace Industry
11. Week	Reverse Engineering in the Medical Device Industry
12. Week	Legal Aspects of Reverse Engineering
13. Week	Barriers to Adopting Reverse Engineering
14. Week	A general design example

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 10

Internet browsing, library work Designing and implementing

materials: 20

Report preparing: 10

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	10
Application		
Projects	1	10
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	4	5	20
Material Design and Implementation	4	5	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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. Hüseyin Kürşad SEZER kursadsezer@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	Polymeric Materials: Molecular Structure and Blends.
3. Week	Description of principal types of plastics.
4. Week	General characteristics of plastics: Strength and stiffness, toughness, fatigue, hardness, effect of temperature, flammability, chemical attack and electrical properties.
5. Week	Reinforced plastics and types of reinforcement.
6. Week	Designing with plastics, design data for plastics.
7. Week	Applications
8. Week	Design with Reinforced Plastics.
9. Week	Injection process.
10. Week	Extrusion, compression and transfer molding, thermoforming.
11. Week	Applications
12. Week	Rolling. Casting. Foams.
13. Week	Joining methods.
14. Week	Design examples.
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 2

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	5	1	5
Studies	6	2	12
Material Design and Implementation	4	6	24
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.					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	Department Management tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 420 – ROBOTICS**
Course Semester	7-8
Catalog Content	Introduction, Basic concepts in robotics, Classification and structure of robotic systems, Drives and control systems, Applications, Kinematic analysis and coordinate transformation, Trajectory interpolators, Applications of robots, Programming, Sensor and intelligent robots, Installing a robot.
Textbook	1. Koren, Y., Robotics for Engineers, McGraw-Hill Pub., Int. Ed., 1985. 2. Niku, S.B., Introduction to Robotics: Analysis, Control, Applications, John Wiley & Sons Pub, USA, 2010.
Supplementary Textbooks	3. Craig, J. J. (2009). Introduction to robotics: mechanics and control, 3/E. Pearson Education India.
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Design and development of robot mechanisms, understanding of movement mechanisms and equipment, learning of robotic programming algorithm
Course Learning Outcomes	1. Students who attend this course learn basics of industrial robotics. 2. They can make better and more efficiently designs based on this course.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction
2. Week	Basic concepts in robotics
3. Week	Classification and structure of robotic systems
4. Week	Drives and control systems
5. Week	Applications
6. Week	Kinematic analysis and coordinate transformation
7. Week	Applications
8. Week	Trajectory interpolators
9. Week	Applications of robots
10. Week	Programming
11. Week	Applications
12. Week	Sensor and intelligent robots
13. Week	Installing a robot
14. Week	Applications

Teaching and Learning Methods

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 2

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 10

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment		
Application		
Projects	1	30
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score		**40**

(%)		
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	7	2	14
Studies	1	5	5
Material Design and Implementation	2	5	10
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	3	6
Final Exam and Preperation for Final Exam	3	4	12
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 422 - Quality Control**
Course Semester	7-8
Catalog Content	This course provides students with basic coverage of topics in quality assurance and management and reliability. Principles of quality control systems, process control concepts, control charts for variables and attributes, process capability analysis, specification and tolerances, acceptance sampling plans, reliability networks, life testing, failure mode and effect analysis, and fault trees are among the topics discussed.
Textbook	Besterfield D.H. Quality Improvement. Pearson, 2012 Jain, P.L. and JainTata Quality Control and Total Quality Management, McGraw-Hill Pub., 2001
Supplementary Textbooks	Brechner, E. (2015). Agile project management with Kanban. Pearson Education.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	Teaching basis of quality control, gaining capabilities for its applications.
Course Learning Outcomes	1. Understand and define concepts in quality and quality management 2. Apply statistical tools in analysis and application of Statistical Process Control 3. Develop control charts for quality improvement 4. Understand sampling process, and design acceptance sampling procedures for quality control 5. Define and provide solutions for simple experimental design problems 6. Understand and define basic concepts in reliability
Instruction Methods	Expression

Weekly Schedule

1. Week	Introduction to Quality
2. Week	History of Quality Movement
3. Week	The Value of Quality
4. Week	Human and Quality
5. Week	Product, Process and Quality
6. Week	Explaing the Meaning of Quality
7. Week	Prepararing of manufacturing process
8. Week	Determination of Requirements Process
9. Week	Desing Process
10. Week	Building of Process
11. Week	Investigation of Process
12. Week	Quality Management System
13. Week	Quality Management System
14. Week	Establishing the Quality Culture
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 6

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	3	2	6
Studies	6	3	18
Material Design and Implementation	5	3	15
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.				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	Department Management tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 424 - Advanced Material Technologies**
Course Semester	7-8
Catalog Content	Structural Materials - Metals, Ceramics and Glasses, Boron Technologies, Polymers and Composites, Functionally graded materials, Smart and Functional Materials Technology, Magnetic, electronic and opto-electronic materials, biomaterials, nanomaterials.
Textbook	1. Baykara, T. 'İleri Malzeme Teknolojileri', PPT, MSB-ArGe, Aralık 2009 2. İstanbul Ticaret Odası, "İleri Malzeme Teknolojileri Sektör Raporu", Mert Özcömert, Ekim 2005 3. Eker, A. A., 'İleri Teknoloji Malzemeleri' , PPT, YTÜ, 2004, 4. Rahaman M.N., Ceramic Processing and Sintering,2003 5. Saxl, O., Opportunities for Industry in teh Application of Nanotechnology, London Office of S&T, 2000
Supplementary Textbooks	
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To teach structure, properties and manufacturing processes of advanced technology materials and the strong relations of these on the material performance. To impart understanding of the importance of material selection and design using material science principles. To introduce high-tech materials used in defense, aerospace, micro-electronics, communications and medical sectors.
Course Learning Outcomes	Understanding of advanced technology materials' high performance and superior qualities in terms of mechanical, thermal, electrical, magnetic, optical, chemical and biological etc. functions
Instruction Methods	Expression

Weekly Schedule

1. Week	Introduction – classification of materials according to basic qualities, behavior, morphology and functions
2. Week	Advanced metallic materials (superalloys)
3. Week	Advanced engineering ceramics
4. Week	Advanced polymers
5. Week	Advanced glass technologies
6. Week	Boron technologies
7. Week	Composites (polymer, metal or ceramic matrix - carbon, glass, aramid, ceramic, boron fibers, or combinations)
8. Week	Midterm exam
9. Week	Functionally graded materials
10. Week	Superconductors / Semiconductors
11. Week	Magnetic, electronic or opto-electronic materials
12. Week	Biomaterials
13. Week	Nanomaterials and applications
14. Week	The situation in Turkey and the world on advanced materials
15. Week	Applications

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 2

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	5	1	5
Studies	6	2	12
Material Design and Implementation	2	4	8
Report Preparing	2	3	6
Preparing a Presentation	2	5	10
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction – classification of materials according to basic qualities, behavior, morphology and functions
2. Week	Advanced metallic materials (superalloys)
3. Week	Advanced engineering ceramics
4. Week	Advanced polymers
5. Week	Advanced glass technologies
6. Week	Boron technologies
7. Week	Composites (polymer, metal or ceramic matrix - carbon, glass, aramid, ceramic, boron fibers, or combinations)
8. Week	Midterm exam
9. Week	Functionally graded materials
10. Week	Superconductors / Semiconductors
11. Week	Magnetic, electronic or opto-electronic materials
12. Week	Biomaterials
13. Week	Nanomaterials and applications
14. Week	The situation in Turkey and the world on advanced materials
15. Week	Applications

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 2

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 12

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	5	1	5
Studies	6	2	12
Material Design and Implementation	2	4	8
Report Preparing	2	3	6
Preparing a Presentation	2	5	10
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction and Basic Concepts
2. Week	Heat Conduction Equation
3. Week	Steady Heat Conduction
4. Week	Transient Heat Conduction
5. Week	Numerical Methods in Heat Conduction
6. Week	Fundamentals of Convection
7. Week	External Forced Convection
8. Week	Internal Forced Convection Natural Convection Boiling and Condensation
9. Week	Boiling and Condensation
10. Week	Heat Exchangers
11. Week	Fundamentals of Thermal Radiation
12. Week	Radiation Heat Transfer
13. Week	Mass Transfer
14. Week	Mass Transfer-Case study

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing

materials: 0

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 0

Final Exam and Preparation for Final Exam: 0

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	10
Application		
Projects	1	10
Practice		
Quiz		
Percent of In-term Studies (%)		**60**

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks			
Studies	3	6	18
Material Design and Implementation	4	5	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Prof. Dr. Veysel ÖZDEMİR vozdemir@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 430 – DESIGN OF HYDRAULICS AND PNEUMATICS SYSTEMS**
Course Semester	7-8
Catalog Content	Introduction to hydraulics. Basic principles and standard symbols in hydraulics. Hydraulic pipes and hoses, pumps, motors. Hydraulic cylinders, sealing elements, valves, oil containers. Filters, accumulators. Hydraulic fluids. Electro-hydraulic systems. Faults and determination of them. Hydraulic circuits. Application areas of hydraulic systems. Hydraulic circuit design and applications. Introduction to pneumatics. Physical principles in pneumatics. Collecting, maintenance and distribution of air. Standard symbols. Cylinders, sealing elements, valves and motors. Design and drawing of pneumatic circuits. Hydro-pneumatics. Application areas of pneumatics. Fault finding. Electro-pneumatics. System design and setting the system up using pneumatic components. Introduction to PLC and its programming. Applications of pneumatic circuits.
Textbook	1. Karacan, İ., Hidrolik-Pnomatik Bizim Büro Yay., Ankara, 1989. 2. Karacan, İ., Pnömatik Kontrol Bizim Büro Yay., Ankara, 1991.
Supplementary Textbooks	
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Elective
Instruction Language	Turkish
Course Objectives	To have the students learn the elements of hydraulic and pneumatic circuits and enable them to design hydraulic and pneumatic systems
Course Learning Outcomes	Students attended to this course know the elements of hydraulic and pneumatic circuits and can sellect, calculate and design hydraulic and pneumatic systems.
Instruction Methods	Face to face

Weekly Schedule	**1. Week**	Introduction to hydraulics. Basic principles in hydraulics
	2. Week	Standard symbols in hydraulics. Hydraulic pipes and hoses
	3. Week	Pumps, motors, hydraulic cylinders
	4. Week	Sealing elements, valves.
	5. Week	Oil containers. Filters, accumulators. Hydraulic fluids.
	6. Week	Electro-hydraulic systems. Faults and determination of them in hydraulic systems.
	7. Week	Hydraulic circuits. Application areas of hydraulic systems in industry.
	8. Week	Hydraulic circuit design and applications.
	9. Week	Introduction to pneumatics. Physical principles in pneumatics.
	10. Week	Collecting, maintenance and distribution of air.
	11. Week	Standard symbols in pneumatics. Cylinders, sealing elements, valves and motors.
	12. Week	Design and drawing of pneumatic circuits. Circuit drawing methods.
	13. Week	Hydro-pneumatics. Application areas of pneumatics. Fault finding.
	14. Week	Electro-pneumatics. System design and setting the system up using pneumatic components.
	15. Week	Introduction to PLC and programming of PLC. Applications of pneumatic circuits.

Teaching and Learning Methods	Weekly theoretical course hours: 2 Weekly tutorial hours: 0 Reading Activities: 2 Internet browsing, library work Designing and implementing materials: 0 Report preparing: 1 Preparing a Presentation: 1 Presentations: 1 Preparation of Midterm and Midterm Exam: 10 Final Exam and Preparation for Final Exam: 10

		Numbers	**Total Weighting (%)**

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	3	2	6
Studies	6	3	18
Material Design and Implementation	5	3	15
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.			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 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.		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. Adnan AKKURT aakkurt@gazi.edu.tr							

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

Weekly Schedule

1. Week	Getting started with Autodesk Fusion 360 Design
2. Week	Working with basic tools
3. Week	Working with surfaces-I
4. Week	Working with surfaces-II
5. Week	Editing surfaces
6. Week	Advanced surface modeling tools-I
7. Week	Editing tools-I
8. Week	Editing tools-II
9. Week	Advanced surface modeling tools-II
10. Week	Advanced modeling and editing tools
11. Week	Advanced editing tools
12. Week	Basics of rendering
13. Week	Surface evaluation and painting
14. Week	Sketching tools, student project
15. Week	

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: -

Reading Activities: 6

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 4

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
Assignment	1	20
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)		60

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

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	3	2	6
Studies	5	3	15
Material Design and Implementation	5	4	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)			
Total Workload	-	-	75
Total Workload / 25			75/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.					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 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.				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	Department Management tasarim@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	Manipulating objects
3. Week	Modelling 3D assets
4. Week	Applying materials and textures
5. Week	Working with backgrounds, cameras, and lighting
6. Week	Applications
7. Week	Rendering a scene
8. Week	Animating objetcs and scenes
9. Week	Applications
10. Week	Working with characters
11. Week	Adding special effects
12. Week	Applications
13. Week	Using dynamic animation systems
14. Week	A general design example.

Teaching and Learning Methods

(These are examples. Please fill which activities you use in the course)

Weekly theoretical course hours: 2

Weekly tutorial hours: 0

Reading Activities: 8

Internet browsing, library work Designing and implementing materials: 30

Report preparing: 10

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	35
Assignment		
Application	1	10
Projects	1	15
Practice		
Quiz		
Percent of In-term Studies (%)		**60**
Percentage of Final Exam to Total Score (%)		**40**
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	2	28
Weekly Tutorial Hours			
Reading Tasks	4	2	8
Studies	3	2	6
Material Design and Implementation	5	5	25
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	4	4
Final Exam and Preperation for Final Exam	1	5	5
Other (should be emphasized)			
Total Workload	-	-	76
Total Workload / 25			76/25
Course Credit (ECTS)			3

Contribution Level Between Course Learning Outcomes and Program Outcomes

No	Program Outcomes	1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems.				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 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.				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	Head of Department tasarim@gazi.edu.tr							