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

Weekly Schedule

1. Week	Introduction
2. Week	Elements of design
3. Week	Elements of design
4. Week	Elements of design
5. Week	Elements of design
6. Week	Elements of design
7. Week	Elements of design
8. Week	Principles of design
9. Week	Principles of design
10. Week	Principles of design
11. Week	Forming techniques (3D)
12. Week	Forming techniques (3D)
13. Week	Forming techniques (3D)
14. Week	Forming techniques (3D)

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 3

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 10

Report preparing: 0

Preparing a Presentation: 6

Presentations: 4

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
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	14	2	28
Reading Tasks			
Studies	10	1	10
Material Design and Implementation			
Report Preparing			
Preparing a Presentation	3	3	9
Presentations			
Midterm Exam and Preperation for Midterm Exam			
Final Exam and Preperation for Final Exam			
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 106 – BASIC DESIGN-II**
Course Semester	2
Catalog Content	Problem solving, Problem definition exercises, Basic problem solving exercises, Discussion on 3D design and space, Exercise on 3D design and space, The concept of structure, Structural exercise sketches, Structural exercise, materials and finalization, Relation between function and material, Relation between function and form, Form based, function and material exercises
Textbook	1. De Bone, E. 1990 Lateral Thinking: Creativity Step-By-Step, HarperCollins. 2. O'Connor, J. and McDermott, I. 1997. The Art of Systems Thinking: Essential Skills for Creativity and Problem Solving, Thorsons Pub. 3. Landa, R. 1998. Thinking Creatively: New Ways to Unlock Your Visual Imagination, North Light Books. 4. Lauer, D., Pentak, S. 2008. Design Basics, Boston: Thomson Woodsworth.
Supplementary Textbooks	1. Computer-Aided Design 2. Int. Journal of Design Engineering
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	1. Designing a network of visual relations / a creative problem solving process 2. Conducting experimental studies to test different materials 3. Developing 3D functional basic systems design 4. Studies on form-function relationship
Course Learning Outcomes	1. Students attending this course learn topics and methods of basic design. 2. They can make basic and medium level designs.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Problem solving
2. Week	Problem definition exercises
3. Week	Basic problem solving exercises
4. Week	Discussion on 3D design and space
5. Week	Exercise on 3D design and space
6. Week	The concept of structure
7. Week	Structural exercise sketches
8. Week	Midterm exam
9. Week	Structural exercise, materials and finalization
10. Week	Relation between function and material
11. Week	Relation between function and form
12. Week	Form based, function and material exercises
13. Week	Function based problem solving
14. Week	Function based problem solving sketches

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		
Assignment		
Application		
Projects	3	60
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	5	2	10
Reading Tasks			
Studies			
Material Design and Implementation	4	5	20
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	3	3	9
Final Exam and Preperation for Final Exam	2	4	8
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. Hamza ÇINAR hamzacinar@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	The meaning and importance of design
3. Week	Historical development of design
4. Week	The importance of design for the national and industrial development
5. Week	Important designs and innovations
6. Week	The methodology of design and its rules
7. Week	Fundamentals of design
8. Week	Elementary design process
9. Week	Analysing simple part designs
10. Week	Component design
11. Week	Applications of component designs
12. Week	Analysing simple system designs
13. Week	System design
14. Week	Applications of system designs

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: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

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 (%)		**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	1	5	5
Material Design and Implementation	2	5	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	-	-	50
Total Workload / 25			50/25
Course Credit (ECTS)			2

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

Weekly Schedule

1. Week	Introduction
2. Week	Variables
3. Week	Input and output
4. Week	Using arithmetic in programming
5. Week	Boolean logic
6. Week	If-Else and switch statements
7. Week	Strings
8. Week	Loops
9. Week	Learning about objects
10. Week	Methods
11. Week	Managing multiple objects
12. Week	Arrays
13. Week	Exception handling, inheritance
14. Week	GUI Programming using Windows forms

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 3

Report preparing: 0

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	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	14	1	14
Reading Tasks			
Studies			
Material Design and Implementation	1	3	3
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	3	3
Other (should be emphasized)			
Total Workload	-	-	50
Total Workload / 25			2
Course Credit (ECTS)			2

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

Weekly Schedule

1. Week	Introduction (importance and description of descriptive geometry)
2. Week	Orthographic projection
3. Week	The projection of a point
4. Week	The projection of lines (general description)
5. Week	The projection of lines (true length and angles)
6. Week	The projection of planes (general description)
7. Week	The projection of planes (edge view and normal view)
8. Week	Multi-auxiliary views
9. Week	Intersections of planes
10. Week	Parallelism and perpendicularity
11. Week	Revolved-view method
12. Week	Intersections of planes and objects
13. Week	Intersections of objects
14. Week	Developments

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	2	20
Application	1	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	10	1	10
Reading Tasks			
Studies			
Material Design and Implementation	1	5	5
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	-	-	50
Total Workload / 25			50/25
Course Credit (ECTS)			2

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 112 - COMPUTER AIDED TECHNICAL DRAWING**
Course Semester	2
Catalog Content	Introduction (summary of previous lectures), Geometric dimensioning and tolerancing, Applications of working drawings, Assembly drawings, Standard parts and their illustrations in assembly drawings, Assembly numbering and bill of materials, Applications of assembly numbering, Drawing of detailed part drawings based on assembly drawings, Applications, Analysing simple designs and preparing their assembly drawings, Applications, Elements for joining used in assemblies (bolted connections, keys, springs) and their illustrations, Gears and cams, Applications.
Textbook	1. Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. 2. Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ankara, 2012.
Supplementary Textbooks	Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	To teach the use of two-dimensional drawing commands of AutoCAD program, to teach the basic concepts of technical drawing, to extract the views of a given part of perspective, to teach the perspective of a given part of the views, to teach special views, to teach section types and cross-sections
Course Learning Outcomes	- Students who attend this course learn topics and methods of advanced technical drawing. - They can draw complicated and advanced level technical drawings.
Instruction Methods	Expression, practice.

Weekly Schedule

1. Week	Introduction (summary of previous lectures)
2. Week	Geometric dimensioning and tolerancing
3. Week	Applications of working drawings
4. Week	Assembly drawings
5. Week	Standard parts and their illustrations in assembly drawings
6. Week	Assembly numbering and bill of materials
7. Week	Applications of assembly numbering
8. Week	Drawing of detailed part drawings based on assembly drawings
9. Week	Applications
10. Week	Analysing simple designs and preparing their assembly drawings
11. Week	Applications
12. Week	Elements for joining used in assemblies (bolted connections, keys, springs) and their illustrations
13. Week	Gears and cams
14. Week	Applications

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 2

Reading Activities: 5

Internet browsing, library work Designing and implementing materials: 8

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 6

Final Exam and Preparation for Final Exam: 6

Assessment Criteria

	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	14	1	14
Reading Tasks	5	1	5
Studies	4	4	16
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	3	6
Final Exam and Preperation for Final Exam	2	3	6
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 113 – TECHNICAL DRAWING-I**
Course Semester	1
Catalog Content	Introduction (basic terms, material and tools, scales, paper sizes), Line and lettering types, Constructional geometry, Applications of constructional geometry, Orthographic projection and drawing, Drawing applications, Sectional views and conventions, Applications, Dimensioning and tolerancing, Pictorial drawings, Surface texture, Standardized tolerances and fits, Working drawings.
Textbook	1. Bağcı, M. ve Bağcı, C., Teknik Resim I ve II, Ankara, 2003. 2. Kurs, U. ve Wittel, H., Teknik Resim (Forberg Technisches Zeichnen - Çeviri: Z. Aksoy), Nobel Yayınevi, Ank., 2012. 3. Çaylak, A., Bilgi ve Uygulama Yaprakları-I, 2005.
Supplementary Textbooks	1. Journal of Engineering Design 2. Computed-Aided Design
Credit	**3 ECTS**
Prerequisites of the Course	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	A designer must use technical drawing language as a universal graphic language to share and communicate design concepts, ideas, and constraints between colleagues and manufacturers. Therefore, the design engineer has to understand and use the basic concepts of this graphic language. The aim of this course is to provide students with the necessary skills for correct communication through engineering drawings.
Course Learning Outcomes	1. Students who attend this course learn topics and methods of technical drawing. 2. They can draw simple and elementary level technical drawings.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction (basic terms, material and tools, scales, paper sizes)
2. Week	Line and lettering types
3. Week	Constructional geometry
4. Week	Applications of constructional geometry
5. Week	Orthographic projection and drawing
6. Week	Drawing applications
7. Week	Drawing applications
8. Week	Sectional views and conventions
9. Week	Applications
10. Week	Dimensioning and tolerancing
11. Week	Pictorial drawings
12. Week	Surface texture
13. Week	Standardized tolerances and fits
14. Week	Working drawings

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	2	20
Application	1	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	14	1	14
Reading Tasks			
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 203 ENGINEERING MECHANICS-I**
Course Semester	3
Catalog Content	General principles. Force vectors: Vector operations, equilibrium of a particle, Equilibrium of 3D systems, Resultant of vorce systems, Moment of a couple, Distributed forces, Equilibrium of a body, Equivalent force systems in bodies. Structural analysis, trusses and frames and machines, internal forces, friction. Centroid and center of gravity. Moment of inertia. Method of virtual work. Introduction to dynamics. Particle kinematics and kinetics. Kinematics and kinetics of rigid body.
Textbook	Hibbeler, "Engineering Statics", 14th Edition
Supplementary Textbooks	1. Hibbeler, Engineering Mechanics 2. Ferdinand P. Beer, "Engineering Statics"
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Investigation of the balance of rigid body by using fundamental principles of mechanics. Establishing the necessary background for the solution of engineering problems in the areas of strength of materials, dynamics and machine theory.
Course Learning Outcomes	1. Learning of the subjects and methods of Engineering Mechanics-I 2. Learning the usage of engineering mechanics in design problems.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction to static and solid mechanics Concepts and Principles. Unit Systems,
2. Week	Vectors, orthogonal components of force and components separation, Newton's laws
3. Week	Forces on surface and space, balance, Free body diagram (SCD)
4. Week	Rigid bodies, internal and external forces, equivalent forces, support types
5. Week	Composite force systems, Moment concept, Rigid Balance of objects
6. Week	Structural analysis, Structural systems, Truss systems, Analysis and calculation, Node and section method
7. Week	Carrier systems, Frames and machines implementation and account
8. Week	Internal forces in beams and cables, distributed forces, flexural strength of beams
9. Week	Force-Moment diagram
10. Week	Center of gravity, Center of gravity of the areas, Moment of inertia, Moment of inertia of fields
11. Week	Friction, dry friction laws, friction coefficients, wheel friction, belt-pulley, friction
12. Week	Virtual work principle
13. Week	Introduction to dynamics. Particle kinematics and kinetics
14. Week	Solid body kinematics and kinetics

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing

materials: 15

Report preparing: 0

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	30
Assignment	5	15
Application		
Projects		
Practice		
Quiz	5	15
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	3	42
Weekly Tutorial Hours			
Reading Tasks	5	1	5
Studies			
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations	1	3	3
Midterm Exam and Preperation for Midterm Exam			10
Final Exam and Preperation for Final Exam	5	3	15
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. Ahmet TAŞKESEN taskesen@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 204 Engineering Mechanics-II**
Course Semester	4
Catalog Content	Introduction and fundamental principles. Mechanical properties of the materials, Stress-Strain transformations, Bending, Shear force, Beam design, Buckling, Torsion, Combined stress, Mohr circle, Applications, A general design exercise.
Textbook	1. Russell C. Hibbeler, Mechanics of Materials, 10th Edition-Pearson (2016). 2. Hibbeler, Engineering Mechanics: Dynamics, Prentice-Hall, Inc, Int. Ed.
Supplementary Textbooks	F. Beer, Mechanics of Materials.
Credit	3 AKTS
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Based on the fundamental mechanics, teaching of fundamental strength principles such as stresses, mechanics of materials etc. Establishing the necessary background for the solution of engineering problems in the areas of machine elements, theory of machines and machine design.
Course Learning Outcomes	1. Learning of the subjects and methods of Engineering Mechanics-II 2. Learning the usage of engineering mechanics in design problems.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction – Stress concept and types. Design considerations.
2. Week	Axial loading. Normal stress, Shear stress. Bearing stresses in bolts and rivets.
3. Week	Strain concept
4. Week	Mechanical properties of the materials. Relationship between stress and strain. Hook's law. Young modulus.
5. Week	Repeated loads. Problems caused by temperature variations. Poisson ratio. Saint-Venant principle.
6. Week	Torsion. Deformations of circular shafts. Torsion angle in elastic range. Design of power transmission shafts.
7. Week	Torsion. Deformations of non-circular shafts. Thin walled shafts.
8. Week	Pure bending. Stresses and deformations in elastic range. Diagrams of shear force and bending moment.
9. Week	Bending and deflection in beams. Elastic curve equation.
10. Week	Shear stresses in beams. Stress-strain transformations.
11. Week	Plane stress transformations. Principle stresses: Maximum shear stress.
12. Week	Mohr circle in plane stress
13. Week	Buckling. Stability of the structures; Euler formula.
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: 3

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	30
Assignment	5	15
Application		
Projects		
Practice		
Quiz	5	15
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	3	42
Weekly Tutorial Hours			
Reading Tasks	5	1	5
Studies	5	1	5
Material Design and Implementation			
Report Preparing			
Preparing a Presentation	1	3	3
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	5	10
Final Exam and Preperation for Final Exam	2	5	10
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. Ahmet TAŞKESEN taskesen@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM-205 Product Design-I**
Course Semester	4
Catalog Content	By this course, the students will be able to recognize the elements used in mechanical design and using the basic engineering sciences to realize the geometric dimensioning by considering the design principles. They will have knowledge about the application areas of these structures.
Textbook	1. Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara 2. Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi.
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	1) To teach different machine drawings according to Turkish standards and World standards 2) Teaching machine science elements and their analysis. 3) To teach industrial design engineers' common problems and practical approaches they need to know during project design.
Course Learning Outcomes	1) To be able to define the design problem 2) To be able to evaluate and develop design 3) To be able to design simple apparatus, mechanisms and machines 4) To be able to select materials by considering design and functional properties
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction, basic concepts
2. Week	Gear wheels - Spur gears
3. Week	Gear wheel mechanisms - Helical gears
4. Week	Gear wheel mechanisms - Bevel gears
5. Week	Sizing of gear wheels and their use in design
6. Week	Profile scroll
7. Week	Gear mechanisms and applications in design systems
8. Week	Chain gear mechanisms and their use in design
9. Week	Sizing of belt pulley mechanisms and their use in design
10. Week	Examples of construction
11. Week	Assembly drawing and detail drawing concepts
12. Week	Assembly drawing and detail drawing applications
13. Week	Assembly drawing and detail drawing applications
14. Week	Assembly drawing and detail drawing 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: 0

Internet browsing, library work Designing and implementing materials: 4

Report preparing: 4

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	30
Assignment		
Application	10	30
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	14	2	28
Reading Tasks			
Studies	2	2	4
Material Design and Implementation	2	2	4
Report Preparing	2	2	4
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	1. Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 207 - Freehand Sketching and Drawing Techniques in Designing**
Course Semester	3
Catalog Content	An overview of freehand sketching, Methods and techniques of freehand sketching, Drawing materials and environments, Visulaization of ideas, Drawing techniques – Perspective, Dimensions, ratio, Light, shadow, Coloring, Description techniques for product design, Quick freehand sketches
Textbook	1. Stanyer, P., The Complete Book of DRAWING TECHNIQUES (A Professional Quide for the Artist, Arcturus Pub., UK., 2003. 2. Necati İnceoğlu, Murat Soygeniş, Ela Çil, Tasarımda Eskizler, Yıldız Teknik Üniverstesi Yay., İstanbul, 1997. Necati İnceoğlu, Tan Gürer, Ela Çil, Düşünme ve Anlatım Aracı Olarak Eskizler, Helikon Yay., İstanbul, 1995. Muhlis Türkmen, Istanbul ve Tarihi Evleri: 1950 - 1985, Yay Yay. İstanbul.
Supplementary Textbooks	Design Sketching by Erik Olofsson and Klara Sjolen.
Credit	**2 ECTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	The aim of the course is to comprehend the creative process behind the design work, to be familiar with the basic information and conceptual works on this subject, to improve the ability of the designer to put the image of the mind in the paper and the quality of perspective and line before the design.
Course Learning Outcomes	- Students who attend this course learn topics and methods of freehand sketching and drawing techniques in designing. - They can make better freehand sketches and drawings.
Instruction Methods	Expression, practice.

Weekly Schedule

1. Week	Presentation of course content, period expectations and grading systems.
2. Week	An overview of freehand sketching
3. Week	Methods and techniques of freehand sketching
4. Week	Drawing materials and environments
5. Week	Visulaization of ideas
6. Week	Drawing techniques - Perspective
7. Week	Drawing techniques - Dimensions, ratio
8. Week	Drawing techniques - Light, shadow
9. Week	Drawing techniques - Coloring
10. Week	Drawing techniques - Coloring
11. Week	Description techniques for product design
12. Week	Description techniques for product design
13. Week	Quick freehand sketches
14. Week	Quick freehand sketches

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 2

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 2

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		
Application		
Projects		
Practice	1	20
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	1	14
Weekly Tutorial Hours	14	1	14
Reading Tasks			
Studies	2	2	4
Material Design and Implementation			
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	-	-	50
Total Workload / 25			50/25
Course Credit (ECTS)			2

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

Weekly Schedule

1. Week	Introduction and basic concepts
2. Week	Historical background 3. production
3. Week	Design and production
4. Week	Designers and design discourse
5. Week	The consumption of design
6. Week	High design
7. Week	Consumer goods
8. Week	Relationship between culture and design
9. Week	Communications, management and participation
10. Week	Networks and mobile technologies
11. Week	Presentations
12. Week	Presentations
13. Week	Presentations
14. Week	Presentations

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: 7

Report preparing: 0

Preparing a Presentation: 0

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	30
Assignment	1	30
Application		
Projects		
Practice		
Quiz		
Percent of In-term Studies (%)	**1**	**60**
Percentage of Final Exam to Total	**1**	**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			
Studies			
Material Design and Implementation	7	1	7
Report Preparing			
Preparing a Presentation			
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			50
Total Workload / 25			50/25
Course Credit (ECTS)			2

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 211 - Material Science**
Course Semester	3
Catalog Content	Classification of materials. Atomic bonds. Cage systems, atomic structures. Aging. Material testing methods: Tensile testing, impact testing, bending, torsion, fatigue, hardness measurement tests. Alloys, phase, component definitions. Phase law, quenching graphics. Ferrit-Sementit phase diagrams. Isothermal transformation and continuous quenching diagrams. Heat treatments of steels, steel standards. Role of alloy elements stainless steels, high speed steels, tool steels, non-metallic materials. Corrosion and protection methods from corrosion.
Textbook	1. Savaşkan, T., Malzeme Bilgisi ve Muayenesi Eğitim Bilimine Giriş, Derya Yay., Trabzon, 2001. 2. Uzun, H., Fındık, F. ve Salman, S., Malzeme Biliminin Temelleri, Değişim Yay., İstanbul, 2003.
Supplementary Textbooks	Callister, W.D., An Introduction to Materials Science and Engineering, John Wiley & Sons, 2003.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	Teaching topics and rules of material science, gaining capabilities for its applications.
Course Learning Outcomes	- Students who attend this course learn basis of material science. - They can use the knowledge of this course while solving design problems.
Instruction Methods	Expression

Weekly Schedule

1. Week	Classification of materials.
2. Week	Atomic bonds. Cage systems atomic structures
3. Week	Crystal systems
4. Week	Aging
5. Week	Material testing methods
6. Week	Tensile testing, impact testing, bending, torsion, fatigue, hardness measurement tests
7. Week	Alloys, phase, component definitions
8. Week	Phase law, quenching graphics, Ferrit-Sementit phase diagrams
9. Week	Isothermal transformation and continuous quenching diagrams
10. Week	Heat treatments of steels, steel standards, role of alloy elements
11. Week	Stainless steels, high speed steels, tool steels
12. Week	Non-metallic materials
13. Week	Corrosion types
14. Week	Protection methods from corrosion

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 12

Internet browsing, library work Designing and implementing materials: 24

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 3

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	11	3	33
Weekly Tutorial Hours			
Reading Tasks	6	2	12
Studies	8	3	24
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	3	3
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 212 – ENGINEERING MATERIALS**
Course Semester	4
Catalog Content	Classification of engineering materials. Iron and steel production. Steel, cast iron types and usage areas. Heat treatment of metals and alloys. Non-ferrous metals and their use. Types, properties and manufacturing methods of ceramic, polymer and composite materials. Damage to materials. Selection of materials in engineering design.
Textbook	A. S.Wadhwa, E. H.S. Dhaliwal, A Textbook of Engineering Material and Metallurgy, Firewall Media, 2008. R.K. Rajput, Engineering Material, 2008
Supplementary Textbooks	W. Callister, Material science and engineering.
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To introduce the basic properties of engineering materials and the material properties of the atomic size, to introduce relations between physical, metallurgical and mechanical properties in materials, test methods and material to be obtained to understand the meaning of the data, to understand the basic principles regarding the selection of materials
Course Learning Outcomes	1) Students who attend this course learn of physical and mechanical properties of materials, heat treatment, phase diagrams and so on. 2) They can work better and more appropriate material while designing.
Instruction Methods	Face to face

Weekly Schedule

1. Week	Introduction
2. Week	Properties of metals and alloys.
3. Week	Fe-Fe3C phase diagram, iron and steel production
4. Week	Effect of alloying elements on properties of steels
5. Week	Heat treatment of metals and alloys
6. Week	Heat treatment of metals and alloys
7. Week	Types and use of steels and cast irons. Designations of steels and cast irons.
8. Week	Non-ferrous metals and alloys.
9. Week	Ceramic materials. Processing and applications of ceramics
10. Week	Polymers. Types of polymers. Processing and applications of polymers
11. Week	Composite materials and their manufacturing methods
12. Week	Failure of materials. Sources and prevention of failures in materials
13. Week	Failure of materials. Sources and prevention of failures in materials
14. Week	Case studies in materials selection

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 23

Report preparing: 0

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	2	10
Application	1	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	14	1	14
Reading Tasks			
Studies	2	4	8
Material Design and Implementation	5	3	15
Report Preparing			
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 213 – MANUFACTURING TECHNOLOGIES - I**
Course Semester	3
Catalog Content	Mechanical and physical properties of materials, metal casting, mechanical deformation processes (bulk and sheet forming), machining and joining operations, powder metallurgy, nontraditional processes, micro and nano fabrication technologies. Machine tools and metal cutting operations, metal cutting mechanics, cutting temperatures, cutting tools: materials and geometry, tool wear and tool life, cutting fluids, economics of metal cutting operations, introduction to computer-aided manufacturing.
Textbook	1. Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed 1997. 2. Boothroyd, G., Knight, W. A., Fundamentals of Machining and Machine Cutting, Mark Dekker Inc., 1989.
Supplementary Textbooks	1. Kalpakjian, S., Schmid, S. R., "Manufacturing Engineering and Technology", Prentice Hall; 5th Ed., 2005 2. DeGarmo, E. P., Black, J. T., "Materials and Processes in Manufacturing", John Wiley & Sons, 10th Ed., 2007.
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Sand casting, molding sand, models and core preparation, molding technique, metal mold casting, casting defects, the melting means. Oxy acetylene welding, arc welding, submerged arc welding, arc welding, welding defects. Free forging and pressing, die forging and pressing, extrusion, rolling, wire drawing and machining procedures.
Course Learning Outcomes	1. Students taking this course learn manufacturing methods and technologies applied in machine manufacturing industry. 2. Learns the casting methods and gains the ability to practice. 3. Learns the welding methods and gains the ability to practice. 4. Learns the mold and core making 5. Learns the hand tools and usage of it in machining. 6. Learns the basic operations of machining. Learns longitudinal, graded, taper turning operations. 7. Learns turning method and cutting tools used in machining. 8. Learns hole drilling and hole enlarging. 9. Learns how to apply screw and reaming operations on drilled holes. 10. Understanding philosophy behind environment, safety, research and ethics
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction and basic aspects
2. Week	Casting: Pattern and core making
3. Week	Casting: Implementation methods
4. Week	Applications
5. Week	Welding and Implementation methods
6. Week	Applications
7. Week	Mold and core making
8. Week	Machining: Basic operations and practical works
9. Week	Machining: General tools and their use
10. Week	Machining: Turning, boring and related processes
11. Week	Applications
12. Week	Machining: Drilling and related hole-making processes
13. Week	Applications
14. Week	Manufacturing a simple system by using the methods learned in this course

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 0

Internet browsing, library work 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		
Application	1	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	14	1	14
Reading Tasks			
Studies	2	5	10
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	Prof. Dr. Adnan AKKURT aakkurt@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 214 - Manufacturing Technologies - II**
Course Semester	4
Catalog Content	Introduction, history of manufacturing engineering, manufacturing engineering education, design and manufacturing, manufacturing engineering and product life cycle, manufacturing processes and technology, case studies in manufacturing engineering, research topics and development trends in manufacturing.
Textbook	1. Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed., 1997. 2. Degarmo, E.P, Black, J.T. and Kohser, R.A., Materials and Processes in Manufacturing, Prentice-Hall, Inc, Int. Ed 1997.
Supplementary Textbooks	Üretim Yöntemleri ve İmalat Teknolojileri (Prof. Dr. Muammer Gavas, Prof. Dr. Mustafa Yaşar, Doç. Dr. Mustafa Aydın, Doç. Dr. Yahya Altunpak)
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	Machining Methods of Machining, Modern Manufacturing Methods, High Velocity Shaping of Metals are evaluated in terms of a designer engineer and training in these subjects
Course Learning Outcomes	1. Learns concepts and systems related to manufacturing technology. 2. Learns the recognize the milling method, tool and apparatus. 3. Learns milling methods such as plane surface, inclined surface, grooving, step milling, division operations etc. 4. Learns turning methods such as plane surface, inclined surface, grooving, step milling, division operations etc 5. Learns the broaching, sawing, rasping, shaping and planing. 6. Learns the basic operations of machining. Learns longitudinal, graded, taper turning operations. 7. Learns turning method and cutting tools used in machining. 8. Learns hole drilling and hole enlarging. 9. Applies cutting, rasping, shaping and planing processes. 10. Understanding philosophy behind environment, safety, research and ethics 11. Learns the powder metallurgy and the sintering processes.
Instruction Methods	Expression

Weekly Schedule

1. Week	Introduction and general principles
2. Week	Machining: Milling
3. Week	Machining: Milling Applications
4. Week	Machining: Turning
5. Week	Machining: Turning Applications
6. Week	Machining: Abrasive processes (grinding, honing, lapping)
7. Week	Machining: Abrasive processes applications
8. Week	Machining: Boring and related processes applications
9. Week	Machining: Basic operations and practical works
10. Week	Machining: General tools and their use
11. Week	Machining: Drilling and related hole-making processes
12. Week	Manufacturing a simple system by using the methods learned in this course
13. Week	System design and manufacturing of it.
14. Week	Introduction and general principles

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: 8

Internet browsing, library work Designing and implementing materials:15

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 6

Final Exam and Preparation for Final Exam: 6

Assessment Criteria

	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 (%)	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	14	1	14
Reading Tasks	4	2	8
Studies	5	3	15
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam			
Final Exam and Preperation for Final Exam	2	5	10
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 215 – COMPUTER AIDED DESIGN-I**
Course Semester	3
Catalog Content	Introduction to CAD, Creating simple parts and drawings, Solid modeling, Surface modeling, Model modeling, Using equations, Working with assemblies, Working with assemblies, Using assembly tools, Animation with motion manager, Creating detailed drawings, Creating complex assembly drawings Creating sheet metal part drawings, Using plastic tooling tools, Example of a general design
Textbook	1. Lombard, M., Solidworks 2013 Bible, Willey Pub., USA, 2013. 2. Taşkesen, A., Mendi, F, Toktaş, İ. ve Eldem, C. AutoCAD ile Çizim ve Modelleme, Gazi Kitabevi, Ankara, 2008. 3. Başak, H. AutoCAD ve Uygulamaları, Nobel Yay., Ankara 2007.
Supplementary Textbooks	Mendi, F., Kişioğlu, Y. ve Teşkesen, A., SolidWorks: Çizim – Modelleme – Analiz, Gazi Kitabevi, Ankara, 2012.
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn the basics of computer-aided design, students' sketch skills in addition to the ability to apply in the computer environment to develop design capabilities.
Course Learning Outcomes	1) Students who attend this course learn basis of advanced computer aided design. 2) They can use better and more efficient computational tools while designing.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction to CAD
2. Week	Create simple parts and drawings
3. Week	Solid modeling
4. Week	Surface modeling
5. Week	Modeling with elements
6. Week	Using equations, working with part formations
7. Week	Working with assemblies
8. Week	Using the mounting tools
9. Week	Animation with motion manager
10. Week	Creating detailed drawings
11. Week	Create complex assembly drawings
12. Week	Creating sheet metal parts drawings
13. Week	Using Plastic Mold Tools
14. Week	Example of a general design

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 40

Report preparing: 0

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	2	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	14	1	14
Reading Tasks			
Studies	1	4	4
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			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	Head of Department tasarim@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 216 - Modelmaking and Prototyping-I**
Course Semester	4
Catalog Content	Introduction, Description of modelmaking and giving some examples, Prototyping interactive electronic products, Modelmaking: Principles and choices, health and safety, space and setup, workflow, tools, Adhesives and fillers, Papers and cartons, foamcore, polystyrene foam, Thermoplastic sheet and extruded shapes, polyurethane modelling board, Wood, Modelling clay, casting, Painting and 3D printing, Graphics: Labels and decals, softgoods: Sewn textile products
Textbook	1. Hallgrimsson, B., Prototyping and Modelmaking for Product Design, Laurence King Pub, Int. Ed., 2012. 2. Shimizu, Y., Kojima, T., Tano, M., Matsuda, S., Models and Prototypes, Graphic Sha Pub Co; Shohan edition (1991)
Supplementary Textbooks	Shovic, J. C., Raspberry Pi IoT Projects, Prototyping Experiments for Makers, 1st ed. Edition.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	To learn basic model and prototype development, to gain the ability to apply. To teach the techniques that may be needed in the process of 3D modelling and prototyping. Demonstrate realizing a design in the idea stage.
Course Learning Outcomes	- Students who attend this course learn basis of model making and prototyping. - They can develop simple and basic level models and prototypes.
Instruction Methods	Expression, practice.

Weekly Schedule

1. Week	Introduction
2. Week	Description of modelmaking and giving some examples
3. Week	How prototypes are used
4. Week	Prototyping interactive electronic products
5. Week	Modelmaking: Principles and choices, health and safety
6. Week	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

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 3

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 8

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 6

Final Exam and Preparation for Final Exam: 6

Assessment Criteria

	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	14	1	14
Reading Tasks			
Studies	2	4	8
Material Design and Implementation			
Report Preparing			
Preparing a Presentation	5	2	10
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	3	6
Final Exam and Preperation for Final Exam	3	3	9
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 218 - Basic Electricity and Electronics**
Course Semester	4
Catalog Content	Electric current, voltage, resistance, capacitance, inductance, conductance-insulation, direct and alternating current. Switches, fuses, inductors, relays, contactors, transformers, electric motors, cables, semiconductors, solenoid valves, automatic circuit breakers. Ohm's Law, Kirchhoff's law, magnetic, chemical, heat and light effects of electrical current. Series and parallel circuits and properties. Direct and alternating current features and circuits. Digital and analogue electrical measuring instruments, direct and alternating current circuits, current and voltage measurements. Direct current and alternating current (single phase and three phase) electric motors, motor connections and control panel connections. Electricity use will be considered in the safety rules.
Textbook	1. Çelebi H.H., Elektrik Bilgisi, Yüce Yayınları, İstanbul, 1999. 2. Özkan T., Temel Elektronik, Kayhan Matbaası, İstanbul, 1995
Supplementary Textbooks	Elektronik Devre Elemanları Elektronik Devreler, Yrd. Doç. Dr. Hüseyin Demirel, 2012.
Credit	**2 ECTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	This course provides basic knowledge about electricity and electronics.
Course Learning Outcomes	The students who take this course, have basic electricity-electronic knowledge.
Instruction Methods	Expression

Weekly Schedule

1. Week	Electric current, voltage, resistance, capacitance, inductance
2. Week	Conductance-insulation, direct and alternating current
3. Week	Switches, fuses, inductors, relays, contactors, transformers
4. Week	Electric motors, cables, semiconductors
5. Week	Solenoid valves, automatic circuit breaker
6. Week	Ohm's Law
7. Week	Kirchhoff's law
8. Week	Magnetic, chemical, heat and light effects of electrical current
9. Week	Series and parallel circuits and their properties
10. Week	Direct and alternating current features and circuits
11. Week	Digital and analogue electrical measuring instruments, direct and alternating current circuits, current and voltage measurements
12. Week	Direct current and alternating current (single and three phases) electric motors, motor connections and control panel connections
13. Week	Direct current and alternating current (single and three phases) electric motors, motor connections and control panel connections
14. Week	Electricity use will be considered in the safety rules

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 2

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 8

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			
Studies	2	4	8
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	2	4
Final Exam and Preperation for Final Exam	2	5	10
Other (should be emphasized)			
Total Workload	-	-	50
Total Workload / 25			50/25
Course Credit (ECTS)			2

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 205 Product Design-II**
Course Semester	4
Catalog Content	In this course, students use the basic engineering concepts to recognize the elements used in mechanical design. They learn the concepts of forming parts according to production methods.
Textbook	1. Makine Teknolojileri için Birimler, Formüller ve Çizelgeler, M., Gülesin, A., Güllü, B.B., Buldum, Seçkin kitabevi, 2003, Ankara 2. Makine Tasarımı Temel İlkeler / Prof. Dr. Tezcan Şekercioğlu Birsen Yayınevi.
Supplementary Textbooks	Makine Meslek Resmi, Nejat Kıraç, Dora Yayınevi
Credit	**4 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	1) To teach different machine drawings according to Turkish standards and World standards 2) Teaching machine science elements and their analysis. 3) To teach Industrial Design Engineers' common problems and practical approaches they need to know during project design.
Course Learning Outcomes	1) To be able to define the design problem 2) To be able to evaluate and develop design 3) To be able to design simple apparatus, mechanisms and machines 4) To be able to select materials by considering design and functional properties 5) To be able to design details by considering production method 6) To be able to make changes in design by evaluating in terms of bearing, sealing and corrosion.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction, basic concepts
2. Week	Define and analyze the design problem
3. Week	Design evaluation and development
4. Week	Design of shaft-hub and wedge connections
5. Week	Use of Splined Shafts, Pins and Pernos in design
6. Week	Description of bearings, general features and numbering
7. Week	The use of bearing bearings and bearing principles
8. Week	Inspection of sealing elements
9. Week	Principles of lubrication of systems and the elements used
10. Week	Design principles in terms of material removal process material removal
11. Week	Design principles of casting parts
12. Week	Design principles of plastic parts
13. Week	Design applications
14. Week	Design 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: 0

Internet browsing, library work Designing and implementing materials: 10

Report preparing: 15

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	30
Assignment		
Application		
Projects	5	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	14	2	28
Reading Tasks			
Studies	2	2	4
Material Design and Implementation	2	2	4
Report Preparing	2	2	4
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	
Final Exam and Preperation for Final Exam	1	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	1. Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction and navigating the CATIA V5 environment
2. Week	Sketcher workbench
3. Week	Part design workbench
4. Week	Drafting workbench
5. Week	Sketcher workbench
6. Week	Complex and multiple sketch parts
7. Week	Assembly design workbench
8. Week	Generative shape design workbench
9. Week	Generative shape design workbench
10. Week	DMU navigator
11. Week	Rendering workbench
12. Week	Parametric design
13. Week	Assembly simulation
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	40
Assignment	1	5
Application		
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	14	1	14
Reading Tasks			
Studies			
Material Design and Implementation			
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	6	12
Final Exam and Preperation for Final Exam	2	8	16
Other (should be emphasized)	1	5	5
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 302 MACHİNE ELEMENTS II**
Course Semester	6
Catalog Content	1. Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley 2. E. Koç, Makine Elemanları-I, Nobel Kitabevi, 2007. 3. E. Koç, Makine Elemanları Çözümlü Problemler, Nobel Kitabevi, 2007. 4. A. Çetin Can, Makine Elemanları Tasarımı, Birsen Yayınevi, 2006. 5. A. Bozacı, İ. Koçaş, Ö. Ü. Çolak, Makine Elemanlarının Projelendirilmesi, Çağlayan Kitabevi, 2001. 6. A. Bozacı, Makine Elemanları Cilt –I, Çağlayan Kitabevi, 2005. 7. H. Rende, Makine Elemanları Cilt –I, Seç Yayın Dağıtım, 2001. 8. M. Gediktaş, Makine Elemanları Problemleri, Çağlayan Kitabevi, 2001.
Textbook	J. E. Shigley, Mechanical Engineering Design, McGrraw-Hill Book Company, 2003
Supplementary Textbooks	Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley
Credit	3 Credit / 4 AKTS
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Introduction of machine elements, strength calculations and sizing, to have information about joints, gears, shafts, belt pulleys, bearings and so on. the ability to make design with
Course Learning Outcomes	1- Learning the types of machine elements. 2- To learn the usage areas of machine elements. 3- Dimensioning of machine elements. 4- To learn the basic theories and calculations related to machine elements. 5- Learning to use machine elements in design. 6- Gaining the ability to identify, formulate and solve engineering problems.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	General Concepts
2. Week	Power and Motion
3. Week	Design of Shafts
4. Week	Design of Shafts
5. Week	Power transmission mechanisms
6. Week	Belt Pulley Design
7. Week	Spur Gear Design
8. Week	Spur Gear Design
9. Week	Helical Gear Design
10. Week	Helical Gear Design,Bevel Gear Design
11. Week	Bevel Gear Design
12. Week	Worm and Gear Design
13. Week	Bearing Design
14. Week	Bearing Design

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 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 Score (%)	x	40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours			
Reading Tasks	6	1	6
Studies			
Material Design and Implementation	8	2	16
Report Preparing			
Preparing a Presentation	2	2	4
Presentations	2	2	4
Midterm Exam and Preperation for Midterm Exam	4	5	20
Final Exam and Preperation for Final Exam	4	2	8
Other (should be emphasized)			
Total Workload			100
Total Workload / 25			100/25
Course Credit (ECTS)			4

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 304 SYSTEMATIC DESIGN-II**
Course Semester	6
Catalog Content	Introduction, Design to allow for expansion, Design to allow for creep and relaxation, Design against corrosion, Design to minimise wear, Design for ergonomics, Design for aesthetics, Design for production, Design for maintenance, Design for recycling, Design for minimum risk, Design to standards, Embodiment design examples.
Textbook	1. Börklü, H.R. (Turkish trans.), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010. 2. English and German Edition of the same book. 3. Börklü, H.R. web site.
Supplementary Textbooks	1 .Journal of Engineering Design 2. Computer-Aided Design 3. Research in Engineering Design
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn systematic design subjects and methods, to gain the ability to apply. Developing a new product with systematic design approach and detailing in the shaping design process.
Course Learning Outcomes	1. Students who attend this course learn topics and methods of systematic design approach. 2. They can apply rules and methods of this approach while designing machines, so they can make designs based on scientific bases and methodical rules.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Design to allow for expansion
3. Week	Design to allow for creep and relaxation
4. Week	Design against corrosion
5. Week	Design to minimise wear
6. Week	Design for ergonomics
7. Week	Design for aesthetics
8. Week	Design for production
9. Week	Design for assembly
10. Week	Design for maintenance
11. Week	Design for recycling
12. Week	Design for minimum risk
13. Week	Design to standards
14. Week	Embodiment 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: 0

Internet browsing, library work Designing and implementing materials: 10

Report preparing: 10

Preparing a Presentation: 5

Presentations: 5

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	1	10
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	2	5	10
Material Design and Implementation	2	5	10
Report Preparing	2	5	10
Preparing a Presentation	1	5	5
Presentations	1	5	5
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. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	Choosing a complex and real problem of product design-III
3. Week	Conducting a literature review and preparing its requirements list
4. Week	Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.)
5. Week	Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach)
6. Week	Making its prototypes and tests
7. Week	Writing a report and preparing its presentations and then presenting it in the classroom
8. Week	Choosing a complex and real problem of product design-IV
9. Week	Conducting a literature review and preparing its requirements list
10. Week	Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.)
11. Week	Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach)
12. Week	Making its prototypes and tests
13. Week	Preparing its handbook and user's manual
14. Week	Writing a report and preparing its presentations and then presenting it in the classroom

Teaching and Learning Methods

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

Weekly theoretical course hours: 4

Weekly tutorial hours: 4

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 24

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 8

Final Exam and Preparation for Final Exam: 8

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
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	14	2	28
Reading Tasks			
Studies	5	1	5
Material Design and Implementation	12	1	12
Report Preparing	8	1	8
Preparing a Presentation	5	2	10
Presentations	5	1	5
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	-	-	100
Total Workload / 25			100/25
Course Credit (ECTS)			4

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	Assoc. Prof. İsmail Şahin isahin@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 311 - Thermodynamics**
Course Semester	5
Catalog Content	Course content and properties of pure substances. Ideal and real gases. Energy, heat, work. Energy conservation, indoor and outdoor systems implementation. Heat machine. The second law of thermodynamics. Carnot Cycle. Clausius inequality, entropy. The increase of entropy principle. Exergy, the second law analysis. Gas power cycles. Steam power cycles. Refrigeration cycles,
Textbook	1. Çengel, Y. ve Boles, M., Mühendislik Yaklaşımıyla Termodinamik, (Çe. T. Derbentli), McGraw-Hill, İst., 1996. 2. Çengel, Yunus A. Fundamentals of thermal-fluid science, McGraw-Hill 3. Öztürk, A. ve Kılıç, A., Çözümlü Problemlerle Termodinamik, Çağlayan Kitabevi, 1998.
Supplementary Textbooks	Öztürk, A. and Kılıç, A., Thermodynamics with Solved Problems, Çağlayan Kitabevi, 1998.
Credit	**3 ECTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Obligatory
Instruction Language	Turkish
Course Objectives	The aim of this course is to introduce the concepts of system definition, environment relation, thermodynamic laws, entropy, usability and irreversibility concepts in thermodynamic system analysis, thermodynamic cycles and thermodynamic analysis of gas mixtures.
Course Learning Outcomes	Students can use energy transformation principles and terminology, design thermal engineering systems, know thermodynamics laws any solve problems in the related areas.
Instruction Methods	Expression, practice.

Weekly Schedule	**1. Week**	Basic concepts and definitions. Dimensions and units. Properties of Systems. State and equilibrium. State change and cycles. Pressure. Temperature. The Zeroth Law of Thermodynamics.
	2. Week	Pure substance and properties. Phases of pure substance and phase change. Properties diagrams and tables.
	3. Week	Ideal gas and equation of state. Real gasses. Compressibility factor. Generalized chart for Compressibility factor. Other equations of state. Introduction to the first law of thermodynamics.
	4. Week	1st law of thermodynamics (for closed systems). Heat and work. Specific heats. Internal energy, enthalpy, specific heat of ideal gasses. Specific heat of solids and liquids.
	5. Week	First law of Thermodynamics (for open systems). Conservation of mass. Conservation of energy. Flow work. Open systems with steady flow.
	6. Week	Unsteady open systems. The uniform-state, uniform-flow systems. Second law of Thermodynamics. Heat engines. Refrigeration systems and heat pumps.
	7. Week	Reversible and irreversible processes. Carnot cycles. Carnot principles. The thermodynamic temperature scale.
	8. Week	Clausius inequality. Entropy. Principle of the increase of Entropy. Third law of Thermodynamics. Entropy change of pure substance. Temperature-Entropy (T-s) diagram.
	9. Week	Entropy change of ideal gasses. Reversible steady flow work. Adiabatic efficiency of some engines. Exergy and second law solution.
	10. Week	Second law solution of closed and open systems. Power cycles with gas flow: Air standard assumptions.
	11. Week	Otto and Diesel cycles. Brayton cycle. Brayton cycle with regeneration. Ideal jet propulsion cycles. Vapor power cycles: Rankine cycle. Ideal reheat Rankine cycle, Ideal regenerative Rankine cycle. Cogeneration.
	12. Week	Refrigeration cycles: Refrigerators and heat pumps. Reversed Carnot cycle. Vapor compression refrigeration cycle. Heat pump systems. Gas refrigeration cycle.
	13. Week	Ideal gas mixtures. Air-vapor mixture.
	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: 3 Reading Activities: 0 Internet browsing, library work Designing and implementing materials: 8 Report preparing: 0 Preparing a Presentation: 0 Presentations: 0 Preparation of Midterm and Midterm Exam: 6 Final Exam and Preparation for Final Exam: 6

Assessment Criteria

	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	3	42
Weekly Tutorial Hours			
Reading Tasks			
Studies	6	3	18
Material Design and Implementation	1	3	3
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	2	3	6
Final Exam and Preperation for Final Exam	2	3	6
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 313 Machine Elements 1
Course Semester	5
Catalog Content	Machine Design is divided 2 sections. One is Basic machine elements and second advanced machine elements. Basic machine elements basic joints such as, riveted joints, welded joints, threaded joints etc. In this course contains Hypothesis of Stresses, Static, Dynamic and full variable stress loading on jointed machine elements.
Textbook	1. Makina Elemanları Mustafa Akkurt, Shigley Mechanical Engineering, J. Edward Shigley 2. J. E. Shigley, Mechanical Engineering Design, McGrraw-Hill Book Company, 2003
Supplementary Textbooks	H. Rende, Makine Elemanları Cilt –I, Seç Yayın Dağıtım, 2001.
Credit	3 Credit / 3 AKTS
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Introduction to machine elements, fasteners and methods, material strength, strength, stress, static and dynamic calculations.
Course Learning Outcomes	1- Learning the types of machine elements. 2- To learn the usage areas of machine elements. 3- Dimensioning of machine elements. 4- To learn the basic theories and calculations related to machine elements. 5- Learning to use machine elements in design. 6- Gaining the ability to identify, formulate and solve engineering problems.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Basic Concept
2. Week	Basic Stresses
3. Week	Hooke Law
4. Week	Strenght of Matereial
5. Week	Hypothesis of Stresses, Static, Dynamic and full variable stress
6. Week	Joints: Riveted Joints
7. Week	Riveted Joints
8. Week	Riveted Joints
9. Week	Welded Joints
10. Week	Welded Joints
11. Week	Fastener Joints
12. Week	Fastener Joints
13. Week	Fastener Joints
14. Week	Fastener Joints

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 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 Score (%)	x	40
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours			
Reading Tasks			
Studies			
Material Design and Implementation	3	2	6
Report Preparing			
Preparing a Presentation	4	1	4
Presentations	3	3	9
Midterm Exam and Preperation for Midterm Exam	3	2	6
Final Exam and Preperation for Final Exam	4	2	8
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. Murat Tolga ÖZKAN tozkan@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 314 INNOVATION AND CREATIVITY**
Course Semester	6
Catalog Content	Introduction, Innovation and creativity, Design and design work: Design as product, process and mental activity, Innovative and creative designs, How designers think and solve problems: Thinking and thinking methods, creative thinking and learning, developing concepts, Creative phases in designing: concepts of fantasy, imagination and reality, Metaphor and paradox: explaining creation, Imagination of forms: Rutin design, innovative design, creative design, The history and description of TRIZ (TIPS), 40 principles and their use in design, The contradiction matrix and its use in design, The other TRIZ tools (material field analysis), Design applications of TRIZ, A general design project.
Textbook	1. Goldenber, J. and Mazarsky, D., Creativity in Product Innovation, Cambridge Univ. Press, Int. Ed., 2002. 2. Niku, S.B., Creative Design of Products and Systems, John Wiley & Sons, Inc., Int. Ed., 2009.
Supplementary Textbooks	1. Int. Journal of Design Creativity and Innovation 2. Int. Journal of Design Engineering
Credit	**2 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn the subjects and methods of innovation and creativity, to gain the ability to practice. To comprehend the areas where innovation can be realized and what can be done for its continuity. To learn the methods used to develop creativity and how to apply these methods.
Course Learning Outcomes	1. Students who attend this course learn basis of innovation and creativity. 2. They can make better designs based on this course.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Innovation and creativity
3. Week	Design and design work: Design as product, process and mental activity
4. Week	Innovative and creative designs
5. Week	How designers think and solve problems: Thinking and thinking methods, creative thinking and learning, developing concepts
6. Week	Creative phases in designing: concepts of fantasy, imagination and reality
7. Week	Metaphor and paradox: explaining creation
8. Week	Imagination of forms: Rutin design, innovative design, creative design
9. Week	The history and description of TRIZ (TIPS)
10. Week	40 principles and their use in design
11. Week	The contradiction matrix and its use in design
12. Week	The other TRIZ tools (material field analysis)
13. Week	Design applications of TRIZ
14. Week	A general design project

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: 10

Report preparing: 6

Preparing a Presentation: 3

Presentations: 3

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	1	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			
Studies	2	2	4
Material Design and Implementation	2	3	6
Report Preparing	1	3	3
Preparing a Presentation	1	3	3
Presentations	1	2	2
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	-	-	53
Total Workload / 25			53/25
Course Credit (ECTS)			2

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. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 315 SYSTEMATIC DESIGN-I**
Course Semester	5
Catalog Content	Introduction, Fundamentals of technical systems, Fundamentals of systematic approach, Product planning, Solution finding methods, Methods of selection and evaluation, Clarification of task (design specification), Conceptual design process, The application of conceptual design, Conceptual design examples, Embodiment design, Basic rules of embodiment design, Principles of embodiment design, Embodiment design examples.
Textbook	1. Börklü, H.R. (Turkish trans.), Mühendislik Tasarımı Sistematik Yaklaşım ('Pahl G., Beitz, W., Feldhusen, J. ve Grote, K.H, Engineering Design: A Systematic Approach, Springer, 2007'), Hatiboğlu Yayınevi, Ankara, 2010. 2. English and German Edition of the same book. 3. Börklü, H.R. web site.
Supplementary Textbooks	1 .Journal of Engineering Design 2. Computer-Aided Design 3. Research in Engineering Design
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn systematic design subjects and methods, to gain the ability to apply. To comprehend the stages of systematic design method and to show these steps in a new product design process. Understand the importance of using a design approach by obtaining more design options than usual with this method.
Course Learning Outcomes	1. Students who attend this course learn topics and methods of systematic design approach. 2. They can apply rules and methods of this approach while designing machines, so they can make designs based on scientific bases and methodical rules.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Fundamentals of technical systems
3. Week	Fundamentals of systematic approach
4. Week	Product planning
5. Week	Solution finding methods
6. Week	Methods of selection and evaluation
7. Week	Clarification of task (design specification)
8. Week	Conceptual design process
9. Week	The application of conceptual design
10. Week	Conceptual design examples
11. Week	Embodiment design
12. Week	Basic rules of embodiment design
13. Week	Principles of embodiment design
14. Week	Embodiment design examples

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 10

Report preparing: 10

Preparing a Presentation: 5

Presentations: 5

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	1	10
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	3	42
Weekly Tutorial Hours			
Reading Tasks			
Studies	2	5	10
Material Design and Implementation	2	3	6
Report Preparing	1	5	5
Preparing a Presentation	1	3	3
Presentations	1	2	2
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. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

Course Description Form	
Course Code and Name	**ETM 107 – FLUID MECHANICS**
Course Semester	6
Catalog Content	Introduction, Fluid statics, Elementary fluid dynamics – Bernolli equation, Fluid kinematics, Finite control valume analysis, Differential analysis of fluid flow, Dimensional analysis, similitude, and modelling, Viscous flow in pipes, Flow over immersed bodies, Open-channel flow, Compressible flow, Turbomachines.
Textbook	Munson, B.R., Young, D.F., Okiishi, T.H. and Huebsch, W.W., Fundemantals of Fluid Mechanics, Wiley Pub. 2009. White, F.M., Fluid Mechanics, McGraw-Hill P., Int. Ed., 2011.
Supplementary Textbooks	Research in Engineering Design Int. Journal of Computer-Aided Engineering
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Introduce the basic concepts of fluid mechanics, the basic equations of fluid mechanics to identify, formulate, and solve the problems of teaching students how to use.
Course Learning Outcomes	1. Students who attend this course learn basis and subjects of fluid mechanics. 2. They can work better and more efficiently while designing.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Fluid statics
3. Week	Elementary fluid dynamics – Bernolli equation
4. Week	Fluid kinematics
5. Week	Finite control volume analysis
6. Week	Differential analysis of fluid flow
7. Week	Dimensional analysis, similtude, and modelling
8. Week	Viscous flow in pipes
9. Week	Flow over immersed bodies
10. Week	Applications
11. Week	Open-channel flow
12. Week	Compressible flow
13. Week	Applications
14. Week	Turbomachines

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 5

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

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 (%)		**40**

Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours	14	3	42
Weekly Tutorial Hours			
Reading Tasks			
Studies	2	5	10
Material Design and Implementation	2	5	10
Report Preparing	2	2	4
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	Doç. Dr. Veysel ÖZEDEMİR vozdemir@gazi.edu.tr							

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

Weekly Schedule

1. Week	Introduction
2. Week	Choosing a problem of product design-I
3. Week	Conducting a literature review and preparing its requirements list
4. Week	Preparing its calculations, analysis, designs and sketches
5. Week	Preparing its computer-aided calculations, models, analysis and animations
6. Week	Making its prototypes and tests
7. Week	Writing a report and preparing its presentations and then presenting it in the classroom
8. Week	Choosing a problem of product design-II
9. Week	Conducting a literature review and preparing its requirements list
10. Week	Preparing its calculations, analysis, designs and sketches
11. Week	Preparing its computer-aided calculations, models, analysis and animations
12. Week	Making its prototypes and tests
13. Week	Preparing its handbook and user's manual
14. Week	Writing a report and preparing its presentations and then presenting it in the classroom

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 3

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 18

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 6

Final Exam and Preparation for Final Exam: 6

Assessment Criteria

	Numbers	**Total Weighting (%)**
Midterm Exams	1	40
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	14	2	28
Reading Tasks			
Studies	5	1	5
Material Design and Implementation	12	1	12
Report Preparing	8	1	8
Preparing a Presentation	5	2	10
Presentations	5	1	5
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	-	-	100
Total Workload / 25			100/25
Course Credit (ECTS)			4

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	Assoc. Prof. İsmail Şahin isahin@gazi.edu.tr							

Course DescriptionForm	
Course Code and Name	**ETM 319 - Ergonomics**
Course Semester	5
Catalog Content	Introduction (aspects of ergonomics, design examples), What is ergonomics and how it can be applied in design, ergonomics designs, Fundamentals of ergonomic design, human and his work in terms of ergonomics, Environmental factors and how they influence human, Organizing ergonomically offices, Contacts (interfaces) between human and machines, Description of anthropometric scales, control of ergonomically offices, Lifting loads and applications of moments, Designing ergonomic tools and instruments, Examples of ergonomic product designs and their evaluations, Control of suitability for ergonomics, Design examples which are suitable in terms of aesthetics and ergonomics, Presentations of student projects and their evaluations.
Textbook	1. Karwowski, W., Soares, M.M. and Stanton, N.A., Human Factors and Ergonomics in Consumer Product Design: Methods and Techniques, CRC Press, 2011. 2. Babalık, F., Mühendisler İçin Ergonomi - İşbilim, Dora, 3. Bas.
Supplementary Textbooks	1. Ergonomics 2. Applied Ergonomics
Credit	**3 AKTS**
Prerequisites of the Course (*Attendance Requirements*)	No Prerequisites - %70 AttendanceRequirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn ergonomics subjects and methods, to gain the ability to apply to the design of environmentally compatible products considering the physical and cognitive abilities of human
Course Learning Outcomes	1. Students who attend this course learn basics of aesthetics and ergonomics. 2. They can work based on rules of aesthetics and ergonomics while designing.
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	Continuing to teach the illustrator program – Digital creation of corporate identity
10. Week	Continuing to teach the illustrator program – Begin to create digital portfolios
11. Week	Applying Digital Portfolios
12. Week	Completion of Digital Portfolio
13. Week	Giving and applying the theoretical information for the printed portfolio
14. Week	Final Exam- Digital and Printed Portfolios

Teaching and Learning Methods

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

Weekly theoretical course hours: 3

Weekly tutorial hours: 0

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 0

Report preparing: 0

Preparing a Presentation: 30

Presentations: 0

Preparation of Midterm and Midterm Exam: 0

Final Exam and Preparation for Final Exam: 0

Assessment Criteria

	Numbers	**Total Weightin g(%)**
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	3	42
Weekly Tutorial Hours			
Reading Tasks			
Studies	10	2	20
Material Design and Implementation			
Report Preparing	4	1	4
Preparing a Presentation	1	3	3
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	3	3
Final Exam and Preperation for Final Exam	1	3	3
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 – COMPUTER-AIDED ENGINEERING**
Course Semester	5
Catalog Content	Introduction, Example of Spring Systems in Finite Element Analysis, Bars and Trusses, Beams and Frames, 2D Elasticity, Plate and Surface Model Analyzes, 3D Elasticity, Design Optimization, Failure Analysis
Textbook	1. Xiaolin Chen, Yijun Liu, Finite Element Modelling and Simulation with ANSYS Workbench, Taylor & Francis Group, ISBN, 13: 978-1-4398-7385-4, 2015. 2. Saeed Moaveni , Finite Element Analysis—Theory and Application with ANSYS, Prentice Hall, 2008.
Supplementary Textbooks	1. Computer-Aided Design 2. Research in Engineering Design 3. Int. Journal of Computer-Aided Engineering
Credit	**2 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Teaching the basic finite element analysis (FEA) theory and commercial FEA software applications for modeling and simulation of engineering problems.
Course Learning Outcomes	1. Students who attend this course learn basis of computer-aided engineering. 2. They can use better and more efficient computational tools while designing.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction, Basic Principles of Finite Element Analysis
2. Week	Spring System Example in Finite Element Analysis
3. Week	1-D Elasticity Theory - Modeling of Bars and Lattice Systems
4. Week	Computer Applications - Bar and Truss System Modeling
5. Week	Beam Theory; Beam and Frame Modeling
6. Week	Computer Applications – Beam and Frame System Modeling
7. Week	2-D Elasticity Problems
8. Week	Midterm exam
9. Week	Meshing and Mesh Optimisation
10. Week	Meshing and Mesh Optimisation
11. Week	Plate and Shell Analysis
12. Week	3-D Elasticity Problems
13. Week	Design Optimisation
14. Week	Failure Analysis
15. Week	Overall Review

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 0

Internet browsing, library work Designing and implementing materials: 9

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 2

Final Exam and Preparation for Final Exam: 3

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	14	1	14
Reading Tasks			
Studies	1	3	3
Material Design and Implementation	2	3	6
Report Preparing			
Preparing a Presentation			
Presentations			
Midterm Exam and Preperation for Midterm Exam	1	2	2
Final Exam and Preperation for Final Exam	1	3	3
Other (should be emphasized)			
Total Workload	-	-	56
Total Workload / 25			56/25
Course Credit (ECTS)			2

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-404 DESIGN PROJECT MANAGEMENT**
Course Semester	7-8
Catalog Content	Students learn the concept of project management. Have an idea about how project management will be realized in design..
Textbook	Ramroth, W.G., Project Management for Design Professionals, AEC Ed., Int. Ed., 2006. Santos, J. M. D., Project Management Absolute Beginner's Guide, 2012 by QUE Publishing
Supplementary Textbooks	Kerzner, H., Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 2013.
Credit	**4 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	To learn design project management topics and methods, to gain the ability to apply. To ensure that human and physical resources are brought together to produce results that will achieve a specific goal within a given time and budget.
Course Learning Outcomes	1. Students who attend this course learn basis of design project management. 2. They can make better design project management based on scientific bases.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction and basic concepts
2. Week	A short history of project and design management
3. Week	Project management goals and activities
4. Week	The design firm and project management
5. Week	Characteristics of a good project manager
6. Week	Planning the project
7. Week	Project risk management
8. Week	Construction cost control
9. Week	Design budget control
10. Week	Project schedule control
11. Week	Project team and client management
12. Week	Project quality control
13. Week	Project management rules of thumb and checklist
14. Week	Tools and software for project management

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: 4

Report preparing: 8

Preparing a Presentation: 6

Presentations: 6

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 4

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	8	2	16
Studies	2 4 2 2 1 1 1	5	10
Material Design and Implementation	1	2	2
Report Preparing	2	8	16
Preparing a Presentation	2	6	12
Presentations	1	4	4
Midterm Exam and Preperation for Midterm Exam	2	2	4
Final Exam and Preperation for Final Exam	1	4	4
Other (should be emphasized)	1	4	4
Total Workload			
Total Workload / 25			100/25
Course Credit (ECTS)			4

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	1. Prof. Dr. H. BAŞAK hbasak@gazi.edu.tr							

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

Weekly Schedule

1. Week	Determination of senior thesis subject
2. Week	Literature review
3. Week	Literature review regarding the selected subject (continue)
4. Week	Literature review regarding the selected subject (continue)
5. Week	Literature review regarding the selected subject (continue)
6. Week	Collecting necessary information
7. Week	Collecting necessary information (continue)
8. Week	Collecting necessary information (continue)
9. Week	Writing the thesis after determining
10. Week	Writing the thesis after determining the information to be included in the thesis (continue)
11. Week	Writing the thesis after determining the information to be included in the thesis (continue)
12. Week	Writing the thesis after determining the information to be included in the thesis (continue)
13. Week	Presentation of the thesis
14. Week	Last editing and submitting of the thesis

Teaching and Learning Methods

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

Weekly theoretical course hours: 0

Weekly tutorial hours: 2

Reading Activities: 10

Internet browsing, library work Designing and implementing materials: 3

Report preparing: 1

Preparing a Presentation: 1

Presentations: 1

Preparation of Midterm and Midterm Exam: 0

Final Exam and Preparation for Final Exam: 10

Assessment Criteria

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

Total Score (%)		
Attendance		

Workload

Activity	Total Number of Weeks	Duration (weekly hour)	Total Period Work Load
Weekly Theoretical Course Hours			
Weekly Tutorial Hours	14	2	28
Reading Tasks	7	1	7
Studies	5	2	10
Material Design and Implementation	5	2	10
Report Preparing			
Preparing a Presentation	1	5	5
Presentations	1	5	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	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

Course DescriptionForm	
Course Code and Name	**ETM 412 Entrepreneurship**
Course Semester	7-8
Catalog Content	Business Intellectual Development and Creativity, Business Plan Concepts and Elements (Market Research, Marketing Plan, Production Plan, Management Plan, Financial Plan), Issues to be Considered in Writing and Presenting Business Plan, Workshops, Support to Training Program Modules
Textbook	1. Gerber, M.E, Girişimcilik Tutkusu, Sistem Yayıncılık, 2011. 2. Kolektif, Girişimcilik, Beta Basım Yayım, 2013. 3. Atasoy, T., Kendinizin Patronu Olmak: Girişimcilik, ODTÜ Geliştirme Vakfı Yay., 2009.
Supplementary Textbooks	
Credit	3 ECTS
Prerequisites of the Course (*Attendance Requirements***)**	No Prerequisites - %70 AttendanceRequirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	The aim of the course is to instill awareness of entrepreneurship, to recognize the problems encountered in daily life might even be a business idea, to encourage young people to start their own business, to enable them to do their feasibility studies by transforming their business ideas and business plans.
Course Learning Outcomes	Students can develop your own business ideas, prepare and present a business plan,work about e-commerce, logistics, foreign trade etc.
Instruction Methods	Expression

Weekly Schedule

1. Week	The Basic Concepts and The Importance of Entrepreneurship
2. Week	Business Idea Development and Creativity Exercises
3. Week	Business Idea Development and Creativity Exercises
4. Week	Concept And Elements of A Business Plan
5. Week	Market Research
6. Week	Marketing Plan, Production Plan
7. Week	Management Plan
8. Week	Midterm exam
9. Week	Financial Plan
10. Week	Cautions For Writing and Presentation of The Business Plan
11. Week	Marketing will doing service production, commerce
12. Week	Tourism, education and vocational job opinions
13. Week	New entrepreneur fields. Entrepreneurship policies, competetive at entrepreneur
14. Week	Reorganising on small and medium sizes enterprises at global rivals
15. Week	Problems and solvings of entrepreneurship and business

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	4	3	12
Material Design and Implementation			
Report Preparing	1	3	3
Preparing a Presentation	3	6	18
Presentations	2	5	10
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 414 Product Design-V
Course Semester	7-8
Catalog Content	Introduction, Choosing the project of a complex and real industrial design (in collaboration with industrial firms), Conducting a literature review and preparing its requirements list, Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.), Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach), Making its prototypes and tests, Preparing its handbook and user's manual, Writing a report and preparing its presentations and then presenting it in the classroom (the project will be assessed by experts coming from university and industrial firms together).
Textbook	Keinonen, T. and Takala, R., Product Concept Design: A Review of the Conceptual Design of Products in Industry, Springer, 2006. Morris, R., Fundamentals of Product Design, AVA Pub., 2009.
Supplementary Textbooks	Bordegoni, M. and Rizzi, C., Innovation in Product Design: From CAD to Virtual Prototyping, Springer, 2011.
Credit	**3 Credit / 6 AKTS**
Prerequisites of the Course (*Attendance Requirements***)**	ETM 406 Product Design-IV - %70 Attendance Requirements
Type of the Course	Compulsory
Instruction Language	Turkish
Course Objectives	Teaching topics and rules of graduation project and thesis, gaining capabilities for its applications. After preparing free hand drawings of this idea, three dimensional modeling in computer-aided programs and product prototyping with various production techniques.
Course Learning Outcomes	1. Students who attend this course learn topics and methods of project preparation. 2. They can prepare a complex and real project.
Instruction Methods	Face to face Practical training

Weekly Schedule

1. Week	Introduction
2. Week	Choosing the project of a complex and real industrial design (in collaboration with industrial firms)
3. Week	Conducting a literature review and preparing its requirements list
4. Week	Preparing its calculations, analysis, designs and sketches (according to aesthetics/ ergonomics/technologic etc.)
5. Week	Continuing the work conducted previous week
6. Week	Preparing its computer-aided calculations, models, analysis and animations (according to systematic approach)
7. Week	Continuing the work conducted previous week
8. Week	Continuing the work conducted previous weeks
9. Week	Making its prototypes and tests
10. Week	Making its prototypes and tests
11. Week	Reorganizing and revising the design according to the results of prototype tests
12. Week	Making its prototypes and tests
13. Week	Preparing its handbook and user's manual
14. Week	Writing a report and preparing its presentations and then presenting it in the classroom (the project will be assessed by experts coming from university and industrial firms together)

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 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	1	20
Assignment	2	20
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	14	1	14
Reading Tasks			
Studies	6	3	18
Material Design and Implementation			
Report Preparing			
Preparing a Presentation	3	3	9
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	Prof. Dr. Hüseyin Rıza BÖRKLÜ rborklu@gazi.edu.tr							

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

Weekly Schedule

1. Week	CNC programming techniques, programming through dialog programming techniques
2. Week	Macro programming
3. Week	Machine parameters
4. Week	DNC and CIM systems
5. Week	Programming of cylindrical, taper turning, grooving and facing operations with dialog programming on CNC a lathe
6. Week	Programming of drilling operations with dialog programming on CNC a lathe
7. Week	Programming of threading, cylindrical turning cycle with dialog programming on CNC a lathe
8. Week	Programming of facing, profile repeating turning cycles with dialog programming on CNC a lathe
9. Week	Programming of threading, grooving and drilling cycles with dialog programming on CNC a lathe
10. Week	Programming of inner operations with dialog programming on CNC a lathe
11. Week	Programming of face, slot milling and drilling operations with dialog programming on CNC a milling machine
12. Week	Programming of contour and profile milling operations with dialog programming on CNC a milling machine
13. Week	Programming of threading operations with dialog programming on CNC a milling machine
14. Week	Programming of pocket milling operations with dialog programming on CNC a milling machine
15. Week	Explaining how to use the simulation program for dialog definitions

Teaching and Learning Methods

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

Weekly theoretical course hours: 2

Weekly tutorial hours: 1

Reading Activities: 10

Internet browsing, library work Designing and implementing materials: 20

Report preparing: 0

Preparing a Presentation: 0

Presentations: 0

Preparation of Midterm and Midterm Exam: 3

Final Exam and Preparation for Final Exam: 5

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 (%)		**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	14	1	14
Reading Tasks	4	5	20
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	5	5
Other (should be emphasized)	3	5	15
Total Workload	-	-	125
Total Workload / 25			125/25
Course Credit (ECTS)			5

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							