Karabük University

Faculty of Engineering
Mechanical Engineering

CEC103	Computer Programming I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	CEC103	Computer Programming I	3	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Learning of programming and algorithm techniques, application of various problem solutions using MATLAB program. To be able to use Matlab program effectively and efficiently in the parts of engineering problems that require programming. To be able to do the programming with Simulik program.
Teaching Methods and Techniques:
Structure of computer systems, Algorithms and algorithm development, Program flow diagrams, Creating simple program flow diagrams with different algorithms, Introduction of Matlab program, Writing programs in Matlab, Basic controls, Variable and Assignments, Arithmetic and Logic Operators, Arrays, Loop Expressions , Terms, Functions and Sub-Procedures, Disk and File Operations, Graphical Representation of Data, Mathematical Expressions, Working with Matlab Gui and Applications, Working with Matlab Simulink and Applications
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. Can Bülent FİDAN
Assistants:

Recommended or Required Reading

Resources	Turkish, Book, • Matlab and Engineering Applications, Uğur ARİFOĞLU, Cemalettin KUBAT.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to computer and its elements		
2	Introduction to computer programming: machine, assembly and high level programming languages.		
3	Problem solving and algorithm development		
4	Flow diagrams and different problem solving techniques		
5	Data types, logical commands, input / output commands in MATLAB programming.		
6	Condition structures and examples in MATLAB programming.		
7	Loop structures and examples in MATLAB programming		
8	Function definitions in MATLAB programming.		

Course Learning Outcomes

No	Learning Outcomes
C01	To comprehend algorithm design and programming logic.
C02	To acquire the skills of writing programs with Matlab.
C03	Programming engineering applications in MATLAB program.
C04	Programming engineering applications in MATLAB program.
C05	Programming engineering applications in MATLAB program.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%20
Quizzes	0	%0
Assignment	3	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	12	4	48
Hours for off-the-c.r.stud	12	1	12
Assignments	4	2	8
Presentation	0	0	0
Mid-terms	1	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	1	10	10
Final examination	1	10	10
Total Work Load			**88**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

FOL183	Foreign Language I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	FOL183	Foreign Language I	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of the course is to improve the students' basic grammar, listening and reading skills at A1 level. It is aimed to improve the students' ability to understand short, simple texts containing the most commonly used words in the target language; to make short, simple descriptions of events; to understand simple, clear, short dialogues; to use grammatical structures correctly.
Teaching Methods and Techniques:
The content of the course is designed to teach basic grammar structures in the target language (such as articles, tenses, imperatives, pronouns and conjunctions), common vocabulary and phrases (such as daily routines, animals, common verbs and transport), and to improve the students' comprehension skills in reading and listening at A1 level (such as introducing a friend and describing people).
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Instructor Akile BAŞARInstructor Nihal TOPCU Instructor Büşra ŞANLI Instructor Duygu YAZICI AŞÇI Instructor Fatma Zehra KÖK

Recommended or Required Reading

Resources 1. Azar, Betty Schrampfer, Fundamentals of English Grammar (New York: Pearson Education, 2003)
2. Murphy, Raymond, Essential Grammar in Use (Cambridge: Ca

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Grammar:Subject Pronouns Verb "To Be"Vocabulary:The Alphabet, Greetings, Countries and NationalitiesReading & Listeni		
2	Grammar:Indefinite Articles (A/ An)Singular and Plural NounsDemonstrative AdjectivesVocabulary:Days, Months, SeasonsR		
3	Grammar:Have got/ Has got Possessive AdjectivesVocabulary:Family Members, Occupations/ JobsReading & Listening:Gett		
4	Grammar:There is/ There areSome/ Any/ NoVocabulary:Common ObjectsReading & Listening:Inviting Someone to the Cine		
5	Grammar:Telling the TimeVocabulary:Cardinal Numbers, Ordinal Numbers, DatesReading & Listening:Understanding Numb		
6	Grammar:Simple Present TenseVocabulary:Daily RoutinesReading & Listening:Interview with a Swimmer		
7	Grammar:Present Continuous TensePresent Continuous Tense Compared with the Simple Present TenseVocabulary:State V		
8	Grammar:ImperativesMaking SuggestionsVocabulary:Weather ConditionsAnimalsReading & Listening: A Good Night's Sleep		
9	MIDTERM EXAM		
10	Grammar:Object PronounsPossessive PronounsOne/ OnesVocabulary:Asking for and Giving DirectionsAsking about PriceRe		
11	Grammar:Simple Past TenseVocabulary:Expressions with go, get, haveReading & Listening: Christopher Columbus		
12	Grammar:Past Continuous TenseVocabulary:Common VerbsReading: The Rabbit and The Turtle		
13	Grammar:Conjunctions: Because, So, But, And, Also, OrVocabulary:Hobbies, Sports, InterestsReading & Listening:Free Tim		
14	Grammar:Prepositions of Time and PlaceVocabulary:Common PlacesReading & Listening:Trains and Travel		
15	Grammar:Articles (a/ an/ the/ Ø)Vocabulary:TransportReading & Listening:Tour of London		
16	FINAL EXAM		
17	FINAL EXAM		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to develop a positive attitude towards the target language.
C02	Students will be able to enhance their basic academic skills in order to communicate both in the academic environment and in daily life.
C03	Students will be able to use A1 level grammar structures and words in the target language.
C04	Students will be able to understand A1 level texts and dialogues in the target language.
C05	Students will be able to express themselves orally in the target language at A1 level.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	2	3	6
Total Work Load			**51**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P03	P04	P05
C01	1	5	1	2
C02	1	5	1	2
C03	1	5	1	2
C04	1	5	1	2
C05	1	5	1	2

Karabük University

Faculty of Engineering
Mechanical Engineering

CHE189	General Chemistry				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	CHE189	General Chemistry	5	4	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course teaches and examines the behavior of atoms and molecules and providing knowledge to students to forecast the behaviour of them in reactions.
Teaching Methods and Techniques:
Knowledge of matter , structure of atom, sequence of electrons, periodic system, Chemical bonds and interactions, classification and atomicity, mole and equivalency concept, chemical laws, reactions, gases, solutions and concentration.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Nurettin ELTUĞRAL
Assistants:

Recommended or Required Reading

Resources

Prof. Dr. Ender Erdik, Prof. Dr. Yüksel Sarikaya; Temel Üniversite Kimyasi, Gazi Kitabevi, Ankara,Petrucci-Harwood-Herring, Genel Kimya, Palme Yayıncılık, Ankara,Peter A

1. Türkçe, Kitap, Petrucci-Harwood-Herring, Genel Kimya, Palme Yayıncılık, Ankara
2. Türkçe, Kitap, Prof. Dr. Ender Erdik, Prof. Dr. Yüksel Sarikaya; Temel Üniversite Kimyasi, Gazi Kitabevi, Ankara
3. Türkçe, Kitap, Peter Atkins, Loretta Jones, Temel Kimya, Moleküller, maddeler ve degisimler, Bilim Yayincilik

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction and General Information		
2	Matter and Measurement		
3	Atoms, Molecules, and ions, Atomic Structure		
4	Chemical Formulas, Reaction Equations		
5	Stochiometry: Chemical calculations		
6	Stochiometry: Chemical calculations		
7	Chemical Reactions in Aqueous Solutions		
8	Solutions, and the concentration		
9	Electronic Configurations and the Periodic Table		
10	Periodic Table		
11	Chemical bonding theorys		
12	Gases		
13	Gases		
14	Thermochemistry		

Course Learning Outcomes

No	Learning Outcomes
C01	Comprehend the basic concepts of chemistry
C02	Recognize the chemical events occurring in the environment
C03	Distinguish matter and properties of matter
C04	Evaluate the basics of heat and energy exchange in chemical reactions
C05	Comprehend basic knowledge to understand the concepts of atomic structure and chemical bonds.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	1	12
Assignments	1	8	8
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	14	1	14
Project	0	0	0
Final examination	1	22	22
Total Work Load			**108**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

PHY195	General Physics I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	PHY195	General Physics I	5	4	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach the concepts of kinematics and dynamics given in the course content, their applications in daily life and modern technology.
Teaching Methods and Techniques:
Units and physical quantities, Vectors, Linear motion, Motion in two dimensions, The Newton laws of motion, Applications of Newton's laws, Work and kinetic energy, Potential energy, Conservation of energy, Linear momentum, Impulse and collisions, Rotation of a rigid body, Rolling motion and angular momentum
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. Necla ÇAKMAK
Assistants:

Recommended or Required Reading

Resources Fundamentals Of Physics, D. Halliday-R. Beichner-J. Walker, John Wiley&Sons, Extended Fifth Edition (1997),University Physics with Modern Physics, H.D. Young ve R.A.
1. Physics for Scientists and Engineers, Raymond Serway-Robert Beichner, BROOKS/COLE CENGAGE Learning, (2010).

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	: 25	**Science**	: 75
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Units and physical quantities		
2	Motion in one dimension		
3	Vectors		
4	Motion in two dimensions		
5	The laws of motion		
6	Applcations of Newton`s law		
7	Applcations of Newton`s law		
8	Work and kinetic energy		
9	Potential energy		
10	Conservation of energy		
11	Lineer momentum		
12	Impulse and collisions		
13	Rotation of a rigid body		
14	Rolling motion and angular momentum		

Course Learning Outcomes

No	Learning Outcomes
C01	Defines the basic concepts of mechanics.
C02	Analyses the dynamics of single and many particle systems.
C03	Formulates mathematically kinematic processes in nature.
C04	Analyses mechanical problems using graphical methods.
C05	Solves the mechanical problems in view of laws and principles.
C06	Defines the relationship between the obtained physical results and technology.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%25
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	1	%10
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	3	36
Assignments	12	1	12
Presentation	0	0	0
Mid-terms	1	10	10
Practice	14	1	14
Laboratory	14	1	14
Project	0	0	0
Final examination	1	15	15
Total Work Load			**143**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE101	Introduction To Mechanical Engineering				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	MEE101	Introduction To Mechanical Engineering	2	2	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To be able to prepare students for information age, to inform about computer hardware and software, to create awareness in Word processors, presentations, spreadsheets, internet and e- mail issues and to use tools and applications related to this field effectively.
Teaching Methods and Techniques:
Computer hardware, software and operating system, internet and internet browser, e-mail management, newsgroups and forums, web based learning, word processing, spreadsheet, presentation maker, personal web site development, e-commerce and making a identifier material.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Öğretmen Gökhan KUTLUÖğretmen Hayriye KUTLU
Assistants:

Recommended or Required Reading

Resources Funda DAĞ, Umut ALTINIŞIK, Serdar SOLAK, Uğur YILDIZ, ilgi Teknolojileri Office Programları ve İnternet, Umut Tepe Yayınları, 2008, ISBN 9786055936075,Fuat Esmera
1. Türkçe, Kitap, 1.Fuat Esmeray, İbrahim Halil Sugözü , Kenan Donuk, Musa Kaplan, Ramazan Demir, Sait Demir, Temel Bilgi Teknolojileri, Nobel Yayın Dağıtım, 2012, IS

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Dersin Amacının Ve Ders İçeriklerinin Tanıtımı, Bilgisayar Tarihi, Mimarisi, Temel Bileşenleri ve Çalışma Mantığı		
2	Temel Bilgisayar yapısı		
3	Yazılım ve İşletim Sistemleri, Windows Temel İşlemler		
4	Internet, e-mail ve Ağ İletişimi		
5	Kelime İşlemci; Dosya işlemleri, Sayfa Yapısı, Metin İşlemleri		
6	Kelime İşlemci; Görsel Ekleme ve Düzenleme		
7	Kelime İşlemci; Gözden Geçirme, Dizin, Kaynakça ve Dip Not		
8	İşlem Tablosu; Elektronik Tablo Programları Hakkında Genel Bilgiler, Doküman Yönetimi, Hücreler Ve Çalışma Sayfasını Biçi		
9	İşlem Tablosu; Formüller ve Fonksiyonlar; Sayısal Formüller, Mantıksal Formüller, Temel Fonksiyonlar		
10	İşlem Tablosu; Grafik Hazırlama ve Değerlendirme, Sıralama ve Filtreleme Koşullu Biçimlendirme		
11	Sunum Hazırlama; Etkili Sunum Teknikleri, Sunu Yapısı, Sayfa Ayarları, Slayt düzeni, Nesne işlemleri		
12	Sunum Hazırlama; Animasyon Düzenleri, Sunu Gösteri Ayarları		
13	Kişisel Web Sitesi Hazırlama; Temel Bilgiler, Site haritası, Ana Sayfa Düzeni URL'leri Tanıma ve Kullanma, Köprüler Ekleme,		
14	Tanıtıcı Materyal Hazırlama; Çalışma Alanı Oluşturma, Hazır Şablonlar, Tasarım yapma		

Course Learning Outcomes

No	Learning Outcomes
C01	Determine the means of information technology hardware and software features
C02	Communicate on the internet and effective use of the Internet
C03	Make text editing
C04	Edit numeric data
C05	Prepare presentation materials
C06	Prepare promotion materials with templates to design a Web page.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	1	14
Hours for off-the-c.r.stud	14	1	14
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	14	2	28
Project	12	2	24
Final examination	1	12	12
Total Work Load			**101**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

CAL181	Mathematics I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	CAL181	Mathematics I	4	4	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to give students the basic concepts of calculus, to teach the concepts of limit, continuity, derivative for single variable functions. Giving the ability of solving engineering problems by using mathematics knowledge.
Teaching Methods and Techniques:
Induction, Sequences, Completeness Axiom, Bolzano-Weierstrass Theorem, Bounded and Monotone Sequences, Series as Sequences and Some Convergence Criteria, the concepts of Greatest Lower Bound, Upper Limit and Lower Limit, Functions, Limits and Continuity, Theorems on Continuous Functions, Descriptions of Some Special Functions, Exponential Function of Base a and Its Inverse, Trigonometric Functions and Its Inverses, Derivative and Its Geometric Comment, Graph drawing.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Instructor Emrullah DemiralDr. Burhan SelçukDr. Hakan Kutucu
Assistants:

Recommended or Required Reading

Resources

Genel Matematik I, Balcı Yayınları, 2008., Thomas' Calculus, Addison-Wesley, 2005., Analize Giriş I(2.Baskı), Grafiker Yayınları, 2007., Genel Matematik, 3. Baskı, Nobel Ya
1. Genel Matematik I, Balcı Yayınları, 2008.
2. İngilizce, Kitap, Thomas' Calculus, Addison-Wesley, 2005.
3. Türkçe, Kitap, Analize Giriş I(2.Baskı), Grafiker Yayınları, 2007.
4. Türkçe, Kitap, Genel Matematik, 3. Baskı, Nobel Yayın Dağıtım Tic. Ltd. Şti., 2009.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	The concept of set, operations on sets. Function and its properties. Inverse function.		
2	The properties of the natural, the rational and the real numbers. The method of Induction.		
3	Numerical sequences and operation on them.		
4	The concept of limit, Convergent sequences, Monotone sequences, the Bolzano -Weierstrass's theorem.		
5	Limit points of a sequence, upper and lower limits, Cauchy's test for convergence.		
6	Cauchy's and Heine's definitions of limit of a function, Algebraic operations on limit.		
7	Cauchy's criterion on the existence of limit of a function, Infinite shrinking and growing functions.		
8	Continuity, Algebraic operations on the continuous functions, compositon function and its continuity.		
9	Monotone functions, Continuity of the inverse of a function.		
10	Points of discontinuity of a function and their classification, The concept uniform continuity.		
11	Differential and derivative of a function, Geometric meaning of derivative. Differential and derivative of the inverse and the		
12	Methods for taking differential. Derivatives of the elementary functions. Higher differential and derivative. Local extremum.		
13	Fermat's, Rolle's, mean value and Darboux theorems. L'Hospital's rule.		
14	Taylor Formula, Finding of the extremum points, Investigation of the graphic of a function.		

Course Learning Outcomes

No	Learning Outcomes
C01	Identify the concept of set and operations on sets.
C02	Identify the concept of function and some elementary functions
C03	Use some properties of real numbers.
C04	Analyze equences and the properties of sequences.
C05	Examine the limits of a sequence and a function.
C06	Use the properties of continuous function.
C07	Calculate derivation of a function.
C08	Draw a graph of a function.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	12	4	48
Assignments	12	1	12
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**141**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01
C06	5

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC105	Technical Drawing				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	CEC105	Technical Drawing	4	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach students to draw side views and sectional views, dimensioning the views and to draw complete structural figures by using technical drawing rules and to read any drawn technical picture.
Teaching Methods and Techniques:
Terms and definitions of technical drawing, tools and equipments of technical drawing, standard writing, types and properties of line and its application areas, rules of drawing, geometrical drawings, scales, projection planes and projection methods, plane views, perspective drawings, rules of dimensioning, sections and applications, surface quality and surface machining symbols, intersection and spreading.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Gökhan Sur
Assistants:

Recommended or Required Reading

Resources
Temel Teknik Resim, , 2013.,Modüler Öğretim Sistemli Uygulama Yapraklı Teknik Resim, , 1995.
1.Temel Teknik Resim, , 2013.
2. Modüler Öğretim Sistemli Uygulama Yapraklı Teknik Resim, , 1995.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Tools and equipments used in technical drawing and standard writing.		
2	Types of lines, geometrical drawing related to lines and angles, polygonal drawings.		
3	Drawings related to circle and tangential lines.		
4	Projection planes and methods.		
5	Drawing three side views from a perspective.		
6	Drawing three side views from a perspective.		
7	Types of perspective and perspective drawing.		
8	Types of perspective and perspective drawing.		
9	Completing missing views and perspective drawing from the views.		
10	Types of sectioning and views of sections.		
11	Types of sectioning and views of sections.		
12	Surface quality and surface machining symbols.		
13	Intersections and spreading.		
14	Intersections and spreading.		

Course Learning Outcomes

No	Learning Outcomes
C01	Extract side views from perspective views
C02	Draw perspective views from side views
C03	Show deatils of objects by using rules of sectioning.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	3	36
Assignments	8	4	32
Presentation	0	0	0
Mid-terms	1	7	7
Practice	0	0	0
Laboratory	14	2	28
Project	0	0	0
Final examination	1	15	15
Total Work Load			**146**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

TRK181	Turkish Language I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
1	TRK181	Turkish Language I	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to inform students about the content, characteristics, and development of Turkish language and to provide them with writing and reading skills in Turkish and to raise the awareness of using Turkish as the national language.
Teaching Methods and Techniques:
This course is designed to teach the definition of language and culture, language-culture relation, the role of language as a social institution in societies, the situation of Turkish Language among world languages, the development and historical periods of Turkish language, the current condition of Turkish Language and span of usage, Turkish Phonology, inflectional and derivational morphemes in Turkish, types of lexicon in Turkish, and elements of the sentence.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Instructor Mesut DOĞANInstructor Nesrin GEZİCİAsist Prof.Dr. Nimet KARA KÜTÜKÇÜAsist Prof.Dr. Ahmet ÖKSÜZInstructor Ayşe TEPEBAŞI

Recommended or Required Reading

Resources	Muharrem Ergin, Üniversiteler İçin Türk Dili, Bayrak Yay. İstanbul,1994.,Editör Ceyhun Vedat Uygur, Yaşar Öztürk, Şerif Kutludağ, Şenel Çalışkan, Aliye Tokmakoğlu, Üniv 1. Muharrem Ergin, Üniversiteler İçin Türk Dili, Bayrak Yay. İstanbul,1994. 2. Editör Ceyhun Vedat Uygur, Yaşar Öztürk, Şerif Kutludağ, Şenel Çalışkan, Aliye Tokmakoğlu,

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	What is language? Definition and characteristics of language, emergence of languages.		
2	What is culture? Relation of language-culture, relation of language-thought, the role and importance of language in society		
3	World languages, types of language, Turkish as standard language, written and spoken language.		
4	Classification of languages, place of Turkish among world languages.		
5	Development and historical periods of Turkish, alphabets that Turks used throughout history, span of usage of Turkish.		
6	Grammar, classification of phonemes in Turkish, phonetics of Turkish.		
7	Vowel and consonant harmony, sound changes, stress and intonation in Turkish.		
8	Morphology, roots and affixes, derivational morphemes and their usage.		
9	Inflectional morphemes and their usage.		
10	Types of words: nouns, adjectives, pronouns.		
11	Types of words: adverbs, prepositions, conjunctions, interjections, verbs.		
12	Types of words: verbs.		
13	Syntax.		
14	Elements of sentence.		

Course Learning Outcomes

No	Learning Outcomes
C01	Identify concepts of language and culture
C02	Comprehend the characteristics of Turkish.
C03	Come to an understanding of development and historical periods of Turkish.
C04	Apply the rules regarding phonetics and phonology of Turkish.
C05	Recognise the types and groups of lexicon.
C06	Distinguish types and elements of sentence.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**60**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE114	Computer Aided Technical Drawing				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	MEE114	Computer Aided Technical Drawing	4	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To have students experienced in technical drawing, to draw and read manufacturing drawing of a part, to guide during drawing stages, to draw (2D and 3D) in CAD environment.
Teaching Methods and Techniques:
Definitions and terms of technical drawing, technical drawing equipments, preperation of technical drawing sheets, standard fonts and heights of fonts, line types, properties and usage places of line types, drawing rules, geometrical drawings, inside and outside tangent drawings of lines with arcs, inside and outside tangent drawings of circles with each other; helical, ellipse, evolvement, cycloid, parabola and hyperbola drawings; scales, scales of enlargement and reduction, methods and planes of projection, views; auxiliary, special, rotated and local views; perspective views; isometric, cavalier, cabinet and bird's-eye projections; the terms and rules of dimensioning, sections and applications of sections, surface treatment symbols, surface quality, indication of surface conditions; definition of CAD system, operating CAD software, sample applications; learning line drawing on computer medium, arraying, conditional drawing, trimming; drawing circle and arc, adjusting view settings; drawing ellipse, polygon, polyline, spline, rectangular; moving, rearranging and scaling drawings; 3D solid modeling methods, dimensioning, obtaining section view, hatching, texting, filleting, chamfering, extending, stretching, making block, replacing block, forming table and letterhead, calculating distance and area, view and zooming commands.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Gökhan SurDr. Abdullah UĞUR
Assistants:

Recommended or Required Reading

Resources

Kadir Gök, Arif Gök, AutoCAD 2015 Eylül 2014 / 10. Baskı / 616 Syf.,Gülesin M., AutoCAD 2007 ile Tasarım ve Modelleme, 2007,Mehmet Şamil Demiryürek, Autocad, Kod
1. Kadir Gök, Arif Gök, AutoCAD 2015 Eylül 2014 / 10. Baskı / 616 Syf.
2. Gülesin M., AutoCAD 2007 ile Tasarım ve Modelleme, 2007
3. Mehmet Şamil Demiryürek, Autocad, Kodlab 2015.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Importance of technical drawing, drawing equipments, drawing sheets and folding sheets, fonts and numbers.		
2	Definition of line and properties, geometrical drawings about lines, geometrical drawings about angles.		
3	Polygon drawings, circle drawings and drawings about tangent lines, tangent junction with arcs, ellipse drawings		
4	Types and methods of projection, basic projection planes, projection of lines, projection of planes.		
5	Views, first projection (ISO-E) method, third projection (ISO-A) method, selecting and placing views, drawing three views f		
6	Auxiliary views, special views, revolved views, inter section, section views and types of sections, section views of a part wh		
7	Completing missing views, drawing perspective from views, selecting enough views.		
8	Terms and rules of dimensioning, dimensioning systems, types of dimensioning and arranging dimensioning.		
9	Drawing circle and arc, adjusting view settings learning to draw ellipse, polygon, polyline, spline, rectangular.		
10	Moving, rearranging and scaling drawings dimensioning, obtaining section view, hatching, texting.		
11	Filleting, chamfering, extending, stretching, making block, replacing block, forming table and letterhead, calculating distanc		
12	Introduction to three-dimensional (3D) drawing.		
13	Modify the surface properties.		
14	Sample 3D drawing		

Course Learning Outcomes

No	Learning Outcomes
C01	Students know the drawing commands
C02	Drawing Creation we know the regulations. .
C03	Students knows Measurements of their diagnosis
C04	Students know 3D Commands.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	2	24
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	10	10
Practice	14	2	28
Laboratory	0	0	0
Project	0	0	0
Final examination	1	17	17
Total Work Load			**107**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC104	Computer Programming II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	CEC104	Computer Programming II	3	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course teaches the fundamental concepts of programming, algorithm for the solution of a problem and writing programme for it.
Teaching Methods and Techniques:
Introduction to programming languages, Algorithm design and flow chart, Data types and variables, operators(arithmetic, relational, logical), control structure (if, while, for), User defined function, arrays and strings, pointers, recursion, searching algorithms, sorting algorithms, file operations.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Instructor Muhammet ÇAKMAKÖğretmen Gökhan KUTLUÖğretmen Hayriye KUTLU
Assistants:

Recommended or Required Reading

Resources Algorithms in C++, Sedgewick, Robert, Addison-Wesley Pub Co, 1992.,The C++ Programming Language, Bjarne Stroustrup, Addison-Wesley Pub, 1997.,C How to Progra
C How to Program, Deitel&Deitel, 5/e,Prentice Hall, 1991, Problem Solving & Program Design in C, B.Koffman, Addison Wesley, 1999, Algorithms in C++, Sedgewick, Rob

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	20	**Science**	:	
Engineering Design	:	80	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to programming languages		
2	Algorithm design and flow chart		
3	Data types and variables		
4	Operators(arithmetic, relational, logical)		
5	Control structure (if, if else)		
6	Control structure (while, for)		
7	User defined function		
8	User defined function with parameters		
9	Arrays and strings		
10	Pointers		
11	Recursion		
12	Searching algorithms		
13	Sorting algorithms		
14	File operations		

Course Learning Outcomes

No	Learning Outcomes
C01	Use the features of the programming languages
C02	Develop and design algorithm.
C03	Use loops and other control structures
C04	Implement fie operstions
C05	Use pointers and arrays

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	1	14
Hours for off-the-c.r.stud	14	1	14
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	10	10
Practice	12	2	24
Laboratory	14	2	28
Project	0	0	0
Final examination	1	12	12
Total Work Load			**106**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P06
C02	5

Karabük University

Faculty of Engineering
Mechanical Engineering

FOL184	Foreign Language II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	FOL184	Foreign Language II	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of the course is to improve the students' basic grammar, listening and reading skills at A2 level. It is aimed to improve the students' ability to understand short, simple texts containing the most commonly used words in the target language; to make short, simple descriptions of events; to understand simple, clear, short dialogues; to use grammatical structures correctly.
Teaching Methods and Techniques:
The content of the course is designed to teach basic grammar structures in the target language (such as adjectives, nouns, tenses, quantifiers, modals, conditionals etc.), common vocabulary and phrases (such as vegetables and fruit, health and illnesses), and to improve the students' comprehension skills in reading and listening at A2 level (such as ordering food in a cafe).
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Instructor Akile BAŞARInstructor Nihal TOPCUInstructor Büşra ŞANLIInstructor Duygu YAZICI AŞÇIInstructor Fatma Zehra KÖK

Recommended or Required Reading

Resources 1. Azar, Betty Schrampfer, Fundamentals of English Grammar (New York: Pearson Education, 2003)
2. Murphy, Raymond, Essential Grammar in Use (Cambridge: Ca

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Grammar:Adjectives and Adverbs Too - enough Vocabulary:Common AdjectivesReading & Listening:The Colou		
2	Grammar:Comparative Adjectives & Superlative AdjectivesAs ..... asVocabulary:Parts of the BodyParts of the FaceReading		
3	Grammar:Countable Nouns &Uncountable NounsQuantifiersVocabulary:Vegetables and FruitReading & Listening:Ordering		
4	Grammar:Present Perfect Tense & Been & GoneVocabulary:Yet, Already, Just, Ever, NeverReading & Listening:Going to the		
5	Grammar:Present Perfect Tense Compared with Simple Past TenseVocabulary:Since, For, AgoReading & Listening:The Old		
6	Grammar:Modals: Can/ Can't & Could/ Couldn't & Should/ Shouldn'tVocabulary:Health and Illnesses Reading & Listening:		
7	Grammar:Modals: Must/ Mustn't Have to /Has to Don't have to/ Doesn't have to Had toVocabularyCl		
8	MIDTERM EXAM		
9	Grammar:Future Tense (Will/ Be Going to)Vocabulary:Common Phrasal VerbsReading & Listening: The Weekend		
10	Grammar:Conditionals: Zero Conditional (Type 0)First Conditional (Type 1) Second Conditional (Type 2)Vocabulary:Rooms		
11	Grammar:Gerunds & InfinitivesVocabulary:Verb + PrepositionsAdjective + PrepositionsReading & Listening: Stop Wasting T		
12	Grammar:Passive VoiceVocabulary:Participle Adjectives (-ing/-ed Adjectives)Reading & Listening:Organising Your Time		
13	Grammar:Relative Clauses (Adjective Clauses)Vocabulary:Expressions with Do and MakeReading & Listening:My Favourite		
14	Grammar:Tag QuestionsVocabulary:ClothesReading & Listening:Online Safety Conversation		
15	Grammar:Too/ Either & So/ NeitherVocabulary:Feelings and EmotionsReading & Listening:Redwood Trees		
16	FINAL EXAM		
17	FINAL EXAM		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to develop a positive attitude towards the target language.
C02	Students will be able to enhance their basic academic skills in order to communicate both in the academic environment and in daily life.
C03	Students will be able to use A2 level grammar structures and words in the target language.
C04	Students will be able to understand A2 level texts and dialogues in the target language.
C05	Students will be able to express themselves orally in the target language at A2 level.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	2	3	6
Total Work Load			**51**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P03	P04	P05
C01	1	5	1	2
C02	1	5	1	2
C03	1	5	1	2
C04	1	5	1	2
C05	1	5	1	2

Karabük University

Faculty of Engineering
Mechanical Engineering

PHY196	General Physics II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	PHY196	General Physics II	5	4	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach the electrical and magnetic fundamental laws and principles, their applications in daily life and modern technology.
Teaching Methods and Techniques:
Electric charge and electric fields, Gauss's law, Electric potential, Capacitance and dielectrics, Current and resistance, Direct current circuits, Magnetic fields and magnetic forces, Sources of the magnetic field, Faraday's law
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. İsmail Atılgan
Assistants:

Recommended or Required Reading

Resources
Fen ve Mühendislik için Fizik I, Raymond Serway-Robert Beichner (Çeviri Ed.: Prof.Dr.Kemal Çolakoğlu), Palme Yayınevi, (2007).,Üniversite Fiziği, Cilt 1, H.D. Young ve R.
1. Physics for Scientists and Engineers, Raymond Serway-Robert Beichner, BROOKS/COLE CENGAGE Learning, (2010).

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Electric charge and electric fields		
2	Gauss`s law		
3	Gauss`s law		
4	Electric potential		
5	Electric potential		
6	Capacitance and dielectrics		
7	Current and resistance		
8	Direct current circuits		
9	Direct current circuits		
10	Magnetic fields and magnetic forces		
11	Magnetic fields and magnetic forces		
12	Sources of the magnetic field		
13	Sources of the magnetic field		
14	Faraday`s law		

Course Learning Outcomes

No	Learning Outcomes
C01	Defines the basic concepts of electricity and magnetism
C02	States the electrical nature of single and many particle systems
C03	Expresses problems of electricity and magnetism via mathematical structures
C04	Solves the electrostatic and magnetostatic problems.
C05	Analyses simple electric circuits.
C06	Defines the relationship between the obtained physical results and technology.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%25
Quizzes	0	%0
Assignment	0	%5
Attendance	0	%0
Practice	0	%10
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	3	36
Assignments	12	1	12
Presentation	0	0	0
Mid-terms	1	10	10
Practice	14	1	14
Laboratory	14	1	14
Project	1	15	15
Final examination	0	0	0
Total Work Load			**143**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

CAL194	Linear Algebra				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	CAL194	Linear Algebra	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to introduce the concepts of matrices, determinant, vector spaces and inner products.
Teaching Methods and Techniques:
Matrix Algebra, Elementary Row Operations on Matrices and Solution of Linear Equations, Special Types of Matrices, Elementary Matrices, Equivalent Matrices, nxn Determinants, properties of Determinants, Vector Spaces, Subspaces, Linear Independence, Basis and Dimension. Linear Transformation and matrix of a Linear Transformation, Eigenvalues and Eigenvectors, Diagonalization Inner Product Spaces.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Özden İŞBİLİRInstructor Ahmet Zahid KÜÇÜKProf.Dr. Ahmet DEMİRDr. Ali CANUndefined Yasemin AYVALIK

Recommended or Required Reading

Resources

A. O. Morris, "LinearAlgebra an Introduction", Chapman&Hall, London, 1982.,SeymourLipschutz, "Theory and Problems of LinearAlgebra", 2nd Ed.,Schaum'sOutline Series
A. O. Morris, "LinearAlgebra an Introduction", Chapman&Hall, London, 1982.
SeymourLipschutz, "Theory and Problems of LinearAlgebra", 2nd Ed.,Schaum'sOutline Series, McGraw-HillBookCompany, 1991. (Türkçesi: Prof. Dr. H. Hilmi Hacısalihoğlu, Arif Sabuncuoğlu, "Lineer Cebir", Nobel Yayın Dağıtım, 2004
WardCheney and David Kincaid, "LinearAlgebraTheory and Applications", Jones and BartlettPublishers, 2009
C. Koç, Topics in LinearAlgebra, METU, 1996 6. K. Hoffman, R. Kunze, LinearAlgebra, Prentice-Hall, 1971.

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Matrix Algebra-I (Homework,Received date of homework : 9. week)		
2	Matrix Algebra-II		
3	Determinants		
4	Determinants and some properties		
5	Systems of Linear Equations		
6	Solution of Linear Equations		
7	Vector Spaces		
8	Linear Independent and Bases		
9	Linear Transformations		
10	Matrix Representation of Linear Transformations		
11	Eigenvalues and Eigenvectors		
12	Diagonalization		
13	Inner Product Spaces-I		
14	Inner Product Spaces-II		

Course Learning Outcomes

No	Learning Outcomes
C01	Do operation on matrices.
C02	Solve the linear equations.
C03	Calculate the determinant of a matrix.
C04	Find the dimensions and bases of vector spaces.
C05	Operate on inner product spaces
C06	Determine eigenvalues and eigenvectors.
C07	Identify diagonalization of matrices and linear transformations.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%30
Quizzes	0	%0
Assignment	0	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	10	1	10
Assignments	2	6	12
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	8	8
Total Work Load			**77**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

CAL182	Mathematics II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	CAL182	Mathematics II	4	4	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course aims at giving students the concept of integral and series. Giving the ability of solving engineering problems by using mathematics knowledge.
Teaching Methods and Techniques:
Integral, Definite and İndefinite Integral, Integration rules, The Riemann integral, Mean-value theorems, The Newton-Leibniz formula, The estimates for sums and integrals, The improper integrals, The application of definite integrals, Series.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Hakan Kutucu
Assistants:

Recommended or Required Reading

Resources

Thomas' Calculus, Addison-Wesley, 2005.,Genel Matematik I, Balcı Yayınları, 2008.,Analize Giriş I(2.Baskı), Grafiker Yayınları, 2007.,Genel Matematik, 3. Baskı, Nobel Yayı
Genel Matematik I, Balcı Yayınları, 2008.
Thomas' Calculus, Addison-Wesley, 2005.
Analize Giriş I(2.Baskı), Grafiker Yayınları, 2007.
Genel Matematik, 3. Baskı, Nobel Yayın Dağıtım Tic. Ltd. Şti., 2009.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Integral, indefinite integral and its main properties.		
2	Integration rules.		
3	Integral methods of trigonometric and irrational expressions, Elliptic integrals.		
4	The Riemann integral.		
5	Cluster of integral functions, The mean value theorem.		
6	The Newton-Leibniz formula for derivative of an integral.		
7	The estimates for sums and integrals: Young's inequality, Hölder's inequality, Minkowski's inequality.		
8	The improper integrals.		
9	Tests of the improper integrals.		
10	Areas in the definite integrals.		
11	Volume in the definite integrals.		
12	Arc Length and Surface Area of Revolution of definite integral.		
13	Series.		
14	Taylor and Maclaurin Series.		

Course Learning Outcomes

No	Learning Outcomes
C01	Define the concept of indefinite integral.
C02	Apply the methods of integration.
C03	Express the properties of the Riemann integral.
C04	Prove the theorems related to the Riemann integral.
C05	Solve the applications of definite integral.
C06	Identify the improper integral.
C07	State the basic properties of series and power series.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%35
Quizzes	0	%0
Assignment	0	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	12	4	48
Assignments	12	1	12
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**141**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE102	Statics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	MEE102	Statics	4	4	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The purpose of this course is to introduce a clear understanding of the principles of rigid body mechanics and the assumptions and idealizations and then to give students the knowledge about equilibrium and internal force concepts, related applications.
Teaching Methods and Techniques:
Statics of particles: forces in plane, forces in space, equilibrium. Moment of a force, moment of a couple. Equivalent systems of forces on rigid bodies. Equilibrium in two dimensions. Equilibrium in three dimensions. Distributed forces: centroids and center of gravity. Analysis of structures: trusses, frames and machines. Internal forces in beams and cables. Friction. Moments of inertia of areas, moments of inertia of masses. Method of virtual work.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Özden İŞBİLİRDr. Mehmet Bakırcı
Assistants:

Recommended or Required Reading

Resources	Vector Mechanics for Engineers, Statics,9th Edition, Ferdinand P.Beer,E.Russel Jıhnstone JR, David Mazurek, Eliot R. Eısenberg; McGraw Hill,2010 .,Engineering Mechanics Engineering Mechanics, Statics;12th Edition; R.C.Hibbeler, Prentece Hall Pearson Education,2010. Vector Mechanics for Engineers, Statics,9th Edition, Ferdinand P.Beer,E.Russel Jıhnstone JR, David Mazurek, Eliot R. Eısenberg; McGraw Hill,2010. Engineering Mechanics,Statics,6th Edition, J.L.Meriam, L.G.Kraige,Wiley,2008.

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	
Engineering	:	30	**Science**	:	20
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	GENERAL PRINCIPLES: fundemental concepts, units of measurement.		
2	FORCE VECTORS: vector operations, cartesian vectors, position vectors, addition and subtraction of cartesian vectors		
3	FORCE VECTORS: vector operations, cartesian vectors, position vectors, addition and subtraction of cartesian vectors		
4	EQUILIBRIUM OF A PARTICLE: coplanar force systems, three dimensional force systems		
5	FORCE SYSTEM RESULTANTS: cross product, moment of a force, moment of a force about a specified		
6	FORCE SYSTEM RESULTANTS: cross product, moment of a force, moment of a force about a specified. Pop Quiz examinati		
7	FORCE SYSTEM RESULTANTS: Moment of a couple, resultant force and couple system. (Assignment will be given for collec		
8	STRUCTURAL ANALYSIS: simple trusses		
9	STRUCTURAL ANALYSIS: frames and machines.		
10	INTERNAL FORCES: internal forces developed in structural members, shear and moment diagrams.		
11	FRICTION: characteristics of dry friction, problems involving dry friction.		
12	FRICTION: Wedges, frictional forces on flat belts		
13	CENTER OF GRAVITY AND CENTROID: center of gravity, center of mass and centroid for a body		
14	Composite bodies		

Course Learning Outcomes

No	Learning Outcomes
C01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
C02	Identify and solve complex mechanical engineering problems.
C03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
C04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
C05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
C06	Work effectively in multidisciplinary teams to accomplish a common goal.
C07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
C08	Recognize the need for lifelong learning and follow up developments in mechanical field.
C09	Recognize the importance of professional and ethical responsibility.
C10	Appreciate the need for knowledge of contemporary issues.
C11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
C12	Collect and classify the data in the applications of mechanical engineering

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	10	2	20
Assignments	1	5	5
Presentation	0	0	0
Mid-terms	1	9	9
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	13	13
Total Work Load			**103**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	3	2	2	2	2	2	2	2	2	2
C01	5	4	3	2	2	2	2	2	2	2	2	2
C02	5	4	3	2	2	2	2	2	2	2	2	2
C03	5	4	3	2	2	2	2	2	2	2	2	2
C04	5	4	3	2	2	2	2	2	2	2	2	2
C05	5	4	3	2	2	2	2	2	2	2	2	2
C06	5	4	3	2	2	2	2	2	2	2	2	2
C07	5	4	3	2	2	2	2	2	2	2	2	2
C08	5	4	3	2	2	2	2	2	2	2	2	2
C09	5	4	3	2	2	2	2	2	2	2	2	2
C10	5	4	3	2	2	2	2	2	2	2	2	2
C11	5	4	3	2	2	2	2	2	2	2	2	2
C12	5	4	3	2	2	2	2	2	2	2	2	2

Karabük University

Faculty of Engineering
Mechanical Engineering

TRK182	Turkish Language II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
2	TRK182	Turkish Language II	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course aims at comprehending elements of sentences and their functions to form sentences; introducing and applying types of written and spoken expressions, differentiating and correcting the mistakes in language exercises; getting acquainted with the rules regarding the preparation of research articles; and developing students' writing and speaking skills via texts chosen from Turkish and World literature, and history of thought.
Teaching Methods and Techniques:
This course is designed to teach the definition of sentence and elements of sentence; sentence analysis and examples of sentence analysis; types of sentences; composition skills; planning of written composition; types of written and oral expression and examples; means of expression and brainstorming in forming paragraphs; ambiguities in sentences; and the rules employed in the conduction of research articles.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Instructor Nesrin GEZİCİAsist Prof. Dr. Ahmet ÖKSÜZAsist Prof.Dr. Nimet KARA KÜTÜKÇÜInstructor Ayşe TEPEBAŞI

Recommended or Required Reading

Resources	Muharrem Ergin, Üniversiteler İçin Türk Dili, Bayrak Yay. İstanbul,1994.,Editör Ceyhun Vedat Uygur, Yaşar Öztürk, Şerif Kutludağ, Şenel Çalışkan, Aliye Tokmakoğlu, Üniv 1. Muharrem Ergin, Üniversiteler İçin Türk Dili, Bayrak Yay. İstanbul,1994. 2. Editör Ceyhun Vedat Uygur, Yaşar Öztürk, Şerif Kutludağ, Şenel Çalışkan, Aliye Tokmakoğlu,

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Sentence: syntactical and semantical sentence categories.		
2	Sentence: Sentence categories according to the place and type of predicate.		
3	Orthographic rules.		
4	Orthographic rules.		
5	Punctuation rules.		
6	Ambiguity in sentences.		
7	Ambiguity in sentences.		
8	Composition.		
9	Types of Expression.		
10	Brainstorming.		
11	Types of Written Expression.		
12	Types of Oral Expression.		
13	Types of Templates.		
14	Methods of Research Article Writing.		

Course Learning Outcomes

No	Learning Outcomes
C01	Comprehend and apply spelling rules and punctuation marks.
C02	Use Turkish language in a correct and elaborate manner.
C03	Apply methods and techniques used in research article writing.
C04	Classify sentences in accordance with their grammatical features
C05	Grasp and implement expression methods.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**60**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01
All	5

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

HST181	Atatürk S Principles and History Of Revolutions I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	HST181	Atatürk S Principles and History Of Revolutions I	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course teaches the spirit and significance of Atatürk s Revolution which aimed at achieving contemporary civilization.
Teaching Methods and Techniques:
Introduction, Fall of the Ottoman Empire, Tanzimat and Islahat Eras, Tripoli and Balkan Wars, World War I, The Armistice of Moudros, the Occupation of Anatolia and the National Reactions, The Birth of the Turkish Revolution, Turkish War of Independence, The Armistice of Mudanya, The Treaty of Lausanne
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Prof.Dr. Nurgün KOÇInstructor Yunus GÖKInstructor Yusuf TEKEInstructor Fatma ERTENInstructor Hamza ÜZÜMCÜInstructor Mustafa KARACA

Recommended or Required Reading

Resources 1. Armaoğlu, Fahir. (2004). 20. Yüzyıl Siyasi Tarihi. İstanbul: Alkım Yayınevi.
2. Berkes, Niyazi. (2012). Türkiye'de Çağdaşlaşma. İstanbul: YKY.
3. Candan, Ahme

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to the History of Turkish Revolution, The Aim of the Course, The characteristics of Turkish Revolution.		
2	The Sources of Turkish Revolution (Internal Causes of the Collapse of the Ottoman Empire(XVII and XIX centurıes).		
3	The Sources of Turkish revolution (External Causes of the Collapse of the Ottoman Empire(XVII and XIX centurıes).		
4	Reform movements of Ottoman Empire in the XVIII and XIX Centuries (Selim III- Mahmut II- Tanzimat- Islahat Eras), I.Co		
5	The Ottoman Empire at the Beginning of 20th Century, The Establısment of İttihat Terakki (Committee of Union and Progre		
6	National Struggle Era, Internal Conditions after Armistice, Minority Movements, Separatist, Useful and harmful Committees		
7	Turkish War of Independence, Prewar Conditions, (Occupation of Izmir, Mustafa Kemal Pasha s Movements, Mustafa Kema		
8	Amasya Protocol, The last Ottoman Parliament, the National Pact, Declaration of the Grand National Assembly, Occupation		
9	Insurrections, Entente States Actions: Parıs Peace Conference, Conference of London , Conference of San Remo, The Trea		
10	War Of Independence, (The Fronts, Battle of I.Inönü and results), Battle of II.Inönü, Battles of Kütahya-Eskişehir.		
11	The Battle of Sakarya, Treaty of Ankara, Büyük Taarruz (Great Offensive).		
12	The Armistice of Mudanya, The Problems Before the Lausanne Conference: The problem of mınority and Armenians, Capitı		
13	The Treaty of Lausanne and its Significance, Articles of the Treaty.		
14	Overview of National Struggle Era.		
15	Midterm Exam.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Explain the final Era of the Ottoman Empire.
C02	Appreciate the situation of the new Turkish state s establishment.
C03	Develop awareness to build a bridge between the past and the future
C04	Express opinion about the problems of Turkey, by valuing the past.
C05	Appreciate the significance of the Treaty of Lausanne.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**51**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10
C01	3	3	2	3	1					3
C02	3	3	2	3	1					3
C03	3	3	2	3	1					3
C04	3	3	2	3	1					3
C05	3	3	2	3	1					3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE215	Differatial Equations				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE215	Differatial Equations	4	4	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To use mathematics for modeling and solution of engineering problems.
Teaching Methods and Techniques:
Classification of differential equations, obtaining differential equations, first order differential equations, higher order linear differential equations, Laplace transform.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Ziyaddin RECEBLİ
Assistants:

Recommended or Required Reading

Resources

M. Çağlıyan, N. Çelik,S. Doğan ,Adi Diferansiyel Denklemler, Nobel Yay, 2007.
1. Türkçe, Kitap, 1. M. Çağlıyan, N. Çelik,S. Doğan ,Adi Diferansiyel Denklemler, Nobel Yay, 2007.
2. M. SEZER, A. Daşcıoğlu,Diferansiyel Denklemler ,Dora, 2010.
3. M. N. Ozer , Matematik Analiz, Nobel, 2005.
4. Shepley L.Ross "Differenttial Equations" John Wiley and Sons Inc. 1984

Course Category

Mathmatics and Basic Sciences	:	100	**Education**	:	
Engineering	:		**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Creation of differential equations. Classification of Differential Equations		
2	First Order and Second Order Differential Equations. Equations that can be divided into variables.		
3	Homogeneous Equations, Equations Reducible to the Homogeneous Case.		
4	First Order Linear Equations. Bernolli Equation.		
5	Exact Differential Equations. Equations Reducible to the Exact Equation Case.		
6	Integral Multiplier		
7	Riccatti Equation		
8	Midterm Exam		
9	Clairaut Equation. Lagrange Equation		
10	Higher Order Linear Equations. Solution of Nonhomogeneous Equations with Constant Coefficients		
11	The Method of Undetermined Coefficients for Solution of Nonhomogeneous Equations with Constant Coefficients		
12	Inverse Image Method for the Solution of Fixed Coefficient Nonhomogeneous Equations. Factor Multiplication for Linear Eq		
13	Reducing the Order of Linear Equations with Variable Coefficients, The Method of Variation of Parameters		
14	Cauchy-Euler Equation		
15	Laplace Transforms		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Categorizes differential equations.
C02	Obtains differential equation from the curve family.
C03	Solves first-order differential equations.
C04	Solves linear differential equations with variable coefficients from the second order.
C05	Solves equations with high order constant coefficients.
C06	Solves differential equations with the help of Laplace transform.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%30
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	3	42
Hours for off-the-c.r.stud	10	3	30
Assignments	2	10	20
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**95**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE213	Dynamics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE213	Dynamics	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach motion of the particles.
Teaching Methods and Techniques:
Principles of Dynamics, Kinematics of Particles, Rectilinear Motion of a Line, Angular Motion of a Line, Plane Curvilinear Motion, Relative Motion in a Plane, Space Curvilinear Motion, Relative Motion in Space, Problems of Kinematics of Particles, Kinetics of Particles-Equation of Motion, Work and Energy, Impulse and Momentum, Centrifugal Force Motion, Problems of Kinetics of Particles
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. CİHAN MIZRAK
Assistants:

Recommended or Required Reading

Resources Mechanical Dynamics for Engineers
J.L. MERIAM, Engineering Mechanics- DYNAMICS

Course Category

Mathmatics and Basic Sciences	:	70	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Principles of Dynamics		

Course Learning Outcomes

No	Learning Outcomes
C01	Gaining the ability to apply the kinematics to the engineering problems for the particle
C02	Gaining the ability of relative motion to the engineering problems for the particles
C03	Gaining the ability to apply the work-energy principles to the engineering problems for the particle
C04	Gaining the ability to apply the impuls-momentum principles to the engineering problems for the particle

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	10	1	10
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	16	16
Total Work Load			**76**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	1	1	1	1	1	1	1	1	1	1

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE207	Manufacturing Processes I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE207	Manufacturing Processes I	4	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To analyze the manufacturing methods of casting, powder metallurgy, joining methods etc. for shaping metallic, ceramic and polymer materials and / or to gain the ability to choose manufacturing method.
Teaching Methods and Techniques:
Classification of manufacturing methods, design / manufacturing relationship, material selection in manufacturing, metal casting processes, sand mold casting, smelting furnaces, precision casting, ceramic mold, pressure casting, blow molding, casting errors. Glass processing methods. Powder metallurgy, powder production techniques, sintering, secondary processes. Joining processes, melting welding, arc welding and equipment, electrodes, laser welding, spot welding, TIG welding, MIG / MAG welding, pressure welding, friction welding, diffusion welding, welding errors, soldering and bonding. Manufacture of plastic parts, plastic types and shaping properties, molding of thermoplastics, injection molding, pressure molding, transfer molding, blow molding, rotational molding, extrusion, joining of thermoplastics.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Mustafa Günay
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Degarmo, E. P., Black, J. T., Kohser, R. A., Klamecki, B. E. Materials and Processes in Manufacturing. New Jersy: John Wiley & Sons, (2003),Kalpakjian, S., Schmid, S.R. "

Course Category

Mathmatics and Basic Sciences	: 10		**Education**	:	
Engineering	: 60		**Science**	: 10	
Engineering Design	: 20		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to manufacturing methods, classification of manufacturing methods, design and manufacturing relationship		
2	Material selection in manufacturing, properties of engineering materials, material selection criteria		
3	Casting processes, sand casting, sand moulds, core and types, patterns, types of moulding sand, properties		
4	Moulding machines, melting furnaces, investment casting, ceramic mould, lost wax process, pressure die casting, centrifug		
5	Casting part properties, casting errors, control methods, molding applications(Assignment deadline: 12th week)		
6	Glass processing, manufacturing and shaping		
7	Powder metallurgy, engineering powders and properties, powder production methods		
8	Powder molding methods, sintering, secondary processes		
9	Joining processes and classification, arc welding methods, fusion welding, oxyacetylene welding, arc welding equipments,		
10	TIG welding, MIG/MAG welding, termite welding, electro-slag welding, laser and electron beam welding		
11	Pressure welding methods, friction welding, resistance welding, difusion welding, spot welding, coating and specifications,		
12	Soldering, soldering types, bonding methods, application areas		
13	Manufacturing of plastic components, characteristics of the forming and shaping, moulding of thermoplastics, principles an		
14	Compression moulding, transfer moulding, blow moulding, rotational moulding, extrusion, thermoforming, bonding of therr		
15	Mid-term exam for this course is done between 7-15th weeks. The weekly course schedule is postponed a week for the ex		

Course Learning Outcomes

No	Learning Outcomes
C01	To describe the relationship between design and manufacturing, metal casting processes, joining processes, plastic parts manufacturing processes
C02	To choose materials in manufacturing, defining the factors affecting the shaping of materials
C03	To analyze casting methods, to identify casting errors
C04	To explain the methods used in shaping ceramic materials
C05	To analyze the joining methods in detail
C06	To learn plastic materials and forming techniques

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	10	2	20
Assignments	1	10	10
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**104**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C02					2	2			2			2
C03				3								
C04	4							4			4	
C05		5					5			5		
C06			5									

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE205	Materials Sience				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE205	Materials Sience	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To give information about basic materials and material selection. To gain knowledge and application skills about destructive and non-destructive inspection methods in the determination of mechanical and physical properties of materials. To improve the properties of materials and gain information about drawing and interpretation of equilibrium diagrams.
Teaching Methods and Techniques:
Classification of materials, Atomic structure, interatomic bonds, Brafis cage and lattice systems, Crystal mistakes, X-ray analysis method, Allotropy, Mechanical properties of metals, Mechanical tests applied to materials, Publishing, Solidification, Methods of improving properties of metals, Forming mechanisms, Fe-Fe3C equilibrium diagrams, Fe- Fe3C equilibrium diagrams, TTT and equilibrium diagrams, Eutectic, eutectoid and peritectic transformations, Equilibrium diagrams of eutectic systems, Fe
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Yakup KAYAProf.Dr. Bilge DEMİRAsist Prof.Dr. Harun ÇUĞ

Recommended or Required Reading

Resources	Çeviri Dr. Mehmet Erdoğan, "", 1999

Course Category

Mathmatics and Basic Sciences	:	50	**Education**	:	0
Engineering	:	50	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Materials science and engineering, Classification of materials, Material selection and design, Atomic structure, Atomic links,		
2	Crystal and crystal structures, Simple cubic, Surface center cubic, volume center cubic, Heggonal tight packings		
3	Bravis cage and crystal systems, X-ray diffraction pattern, Allotropy		
4	Crystal defects, Zero dimension, One dimensional, two and three dimensional faults, Dislocations		
5	Shaping mechanisms; Slip, twinning, grain boundary shift.		
6	Mechanical properties of materials, Destructive test methods, Tensile, compression and creep test		
7	Impact notch and toughness, bending, fatigue, hardness test methods and fracture		
8	Midterm		
9	Publishing and publishing mechanisms, Publishing and surface finishing methods		
10	Solidification of metals, nucleation and growth of crystals, solidification errors in metals,		
11	Mechanisms for improving the properties of metals Working hardening, Precipitation hardening, Grain hardening, Cold defc		
12	Gibbs phase law, Phase calculations, Evaluation of equilibrium diagrams		
13	Equilibrium diagrams of solid solutions, eutectic, eutectoid, peritectic systems		
14	Eutectic, eutectoid and peritectic transformations on Fe-Fe3C equilibrium diagram and equilibrium diagram		
15	TTT and CCT conversion curves and triple phase diagrams		
16	final exam		
17	final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Classify engineering materials.
C02	He knows the structure of the material and can explain the ties between the materials.
C03	Know the crystallographic structure, can calculate the atomic occupancy factor.
C04	Classify crystal defects.
C05	Knows and explains the mechanisms of strength enhancement.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	14	2	28
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	3	3	9
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	3	3	9
Total Work Load			**74**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
C01	5	5	2			1					
C02	5	5	2			1					
C03	5	5	2			1					
C04	5	5	2			1					
C05	5	5	2			1					

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC205	Probability and Statistics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	CEC205	Probability and Statistics	2	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach basic probability and statistics concepts at an applicable level to the engineering students.
Teaching Methods and Techniques:
Data type, Sampling and collecting data, Frequency tables, Visualizing data, Central tendency measures(mean, mod, median), Dispersion measures(variance and standart deviation), Introduction to probability, Conditional probability and independence, Probability density function, Random variables, expectation, moment generating functions. Distributions(Normal, Binom, Bernoulli, Uniform, Gaussian, Exponential, Poisson, Gamma).
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. İlker Türker
Assistants:

Recommended or Required Reading

Resources
A Modern Introduction to Probability and Statistics - Dekking et al.,Olasılık ve İstatistik - Prof. Dr. Fikri Akdeniz
Probability and Statistics
Anwar Hossain and Oleg Makhnin

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	30
Engineering	:	30	**Science**	:	40
Engineering Design	:	30	**Health**	:	20
Social Sciences	:	0	**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic concepts and axioms, sets, counting	Reading	Course note
2	Permutation and combination	Reading	Course Note
3	Probability	Reading	Course Note
4	Conditional probability, independence	Reading	Course Note
5	Random variables	Reading	Course Note
6	Continuous and discrete random variables	Obtaining a real-world dataset	Course Note
7	Probability distribution functions of random variables	Reading	Course Note
8	Probability density functions of random variables	Reading	Course Note
9	Midterm Exam	Studying	Course Note
10	Gauss, Binomial distributions	Preparing distribution of a real-world da	Course Note
11	Binomial, Poisson distributions	Reading	Course Note
12	Geometric and negative binomial distributions	Reading	Course Note
13	Expected value	Calculating expected value on a dataset	Course Note
14	Expected values of random variables	Reading	Course Note
15	Central Limit Theorem	Reading	Course Note

Course Learning Outcomes

No	Learning Outcomes
C01	Applies the fundamental concepts of probability and statistics to real-world engineering problems.
C02	Constructs the probability distributions of random variables based on real-life scientific scenarios and data sets, and then uses it to find expectation and variance.
C03	Explains the fundamental concepts of probability theory.
C04	Learns basic probability distributions and applies them to real-world problems

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	1	5	5
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**121**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE203	Strength Of Materials I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE203	Strength Of Materials I	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course aims to provide mechanical engineering students with the ability to analyze the strength of materials' problems simply and logically and to solve them using the basic principles of mechanics.
Teaching Methods and Techniques:
Introduction, Concept of stress, Stress and deformation under axial loading, Stress and deformation under torsion, Stress and deformation under pure bending, Analysis and design of beams for bending
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:
Dr. Özden İŞBİLİR
Assistants:

Recommended or Required Reading

Resources Mechanics of Materials, 9th Edition, R.C. Hibbeler, 2013, Pearson, ISBN:978-0133254426,Mechanics of Materials, 6th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., J
Strength of Materials I course notes

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:	40	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction and Concept of Stress- Introduction- A Review of the Methods of Statics- Stresses in the Members of a Structu		
2	Introduction and Concept of Stress- Application to the analysis and design of simplestructures- Stress on an oblique plane-		
3	Stress and Deformation Under Axial Loading- Normal strain under axial loading- Engineering stress-strain diagram- True st		
4	Stress and Deformation Under Axial Loading- Deformation under axial loading- Statically indeterminate cases- Thermal stre		
5	Stress and Deformation Under Axial Loading- Shear stress and deformation- Relation among the material properties- Stress		
6	Torsion- Stresses in a Shaft- Elastic deformation under torsion- Stress in the elastic range		
7	Torsion- Statically indeterminate shafts- Design of shafts- Stress concentrations in shafts		
8	Torsion- Plastic deformations under torsion- Elasto-plastic deformation under torsion- Residual Stresses under torsion		
9	Pure Bending- Deformations in a symmetric member under pure bending- Stresses and deformations in the elastic Range		
10	Pure Bending- Deformations in a transverse cross section- Bending of composite members- Stress concentrations		
11	Pure Bending- Plastic deformation- Elasto-plastic deformation- Residual stresses		
12	Pure Bending- Eccentric axial loading- Unsymmetric bending		
13	Analysis and Design of Beams forBending- Shear and bending moment diagrams- Relations among diagrams		
14	Analysis and Design of Beams forBending- Design of prismatic beams for bending- Nonprismatic beams		

Recommended Optional Programme Components

MEE102 Statics

Course Learning Outcomes

No	Learning Outcomes
C01	Explains the stress, types of stress and deformation.
C02	Calculates stresses, elasto-plastic stress and residual stresses under axial loading.
C03	Determines shear stresses and twist angles in shafts under torsion.
C04	Calculates normal stresses in beams exposed to simple bending.
C05	Draws the shear force and the bending moment diagrams along the beam depending on the loading and supports.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	5	%10
Assignment	5	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	2	26
Assignments	5	1	5
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**108**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P07
All	5	4	3	5	4
C01	5	4	3	5	4
C02	5	4	3	5	4
C03	5	4	3	5	4
C04	5	4	3	5	4
C05	5	4	3	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

FOL281	Technical Foreign Language I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	FOL281	Technical Foreign Language I	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
In global world ,it is too important following developed technology and new acedemic studies.By this lecture, the students can learn technical English and this enables to beter understand of acedemic issue or new design techonology. Furthermore , their translation and communication skills can improve by this way.
Teaching Methods and Techniques:
Basic technical terms of mechatronic engineering, systems engineering, operations research, computer engineering, hardware and network software engineering, metallurgical engineering, iron and steel casting, ceramic engineering, mechanical engineering, mechatronics and mechanic,electrical engineering, automotive engineering in English
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Instructor Volkan AYDIN

Recommended or Required Reading

Resources Oxford English for Electrical and Mechanical Engineering, Oxford University Press, E. H. Glendinning and N. Glendinnig, 1995, The Language of Mechanical Engineering in

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic technical terms of industrial engineering in English		
2	Basic technical terms of systems engineering in English		
3	Basic technical terms of operations research in English		
4	Basic technical terms of computer engineering in English		
5	Basic technical terms of hardware and network engineering in English		
6	Basic technical terms of software engineering in English		
7	Basic technical terms of metallurgical engineering in English		
8	Basic technical terms of iron and steel casting in English		
9	Basic technical terms of ceramic engineering in English		
10	Basic technical terms of mechanical engineering in English		
11	Basic technical terms of mechatronics and mechanic in English		
12	Basic technical terms of hydromechanic and hydrolic machines in English		
13	Basic technical terms of electrical engineering in English		
14	Basic technical terms of automotive engineering in English		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Use different occupational terms
C02	Demostrate presentation skills by learning technological development with literature searching.
C03	Translate text from English to Turkish and from Turkish to English.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
C01							3	3			
C02							3	3			
C03							3	3			

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE211	Thermodynamics I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
3	MEE211	Thermodynamics I	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Defining basic concepts for understanding the principles of thermodynamics. Transferring basic information about energy and transformations, gaining engineering perspective.
Teaching Methods and Techniques:
Introduction and basic concepts. Energy conversions and general energy analysis. Properties of pure substances. Energy analysis of closed systems. Mass and energy analysis for control volumes.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Kamil ArslanDr. Erhan KayabaşıDr. Enes KılınçDr. Abdulrazzak Akroot
Assistants:

Recommended or Required Reading

Resources Y.A. Cengel, M.A. Boles, Thermodynamics: an Engineering Approach 9th Edition, 2019.,Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey, "Fun
Y. A. Çengel and M. A. Boles, Thermodynamics: An Engineering Approach, 5th ed, McGraw-Hill, 2006.

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	70	**Science**	:	
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	General information, units and definitions, system, forms of energy, properties of the system, state and balance.		
2	The zeroth law of thermodynamics, temperature, pressure, manometer, barometer and atmospheric pressure.		
3	Ideal gas laws, state changes		
4	Ideal gas laws, state changes		
5	Phase changes, property diagrams and tables of pure substances		
6	Phase changes, property diagrams and tables of pure sunstances		
7	Illustrate the P-v, T-v, and P-T property diagrams and P-v-T surfaces of pure substances		
8	Midterm Exam		
9	Specific heat, Internal energy, enthalpy and specific heat of ideal gases.		
10	Energy analysis of closed systems		
11	Internal energy enthalpy and specific heat of solids and liquids		
12	The principle of conservation of mass		
13	Flow work and fluid energy		
14	Energy analysis of continuous flow open systems		
15	Energy Analysis of Unsteady-Flow Processes		
16	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Makes calculations about heat and temperature.
C02	Makes calculations related to concepts such as weight, specific gravity, mass, specific mass, pressure and absolute pressure.
C03	Makes calculations related to Ideal Gas Laws.
C04	Makes calculations related to the general equation of gases.
C05	create and analyze mathematical models for open and closed systems using basic conservation laws.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**118**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02
All	5	4
C01	5	
C02	5	
C03	5	
C04	5	
C05	5	

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

HST182	Atatürk S Principles and History Of Revolutions II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	HST182	Atatürk S Principles and History Of Revolutions II	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course provides the Turkish youth with consciousness about Ataturk's Principles and Revolutions and educates them in accordance with Kemalism.
Teaching Methods and Techniques:
Political Reforms, Legal Reforms, Educational and Cultural Reforms, Economic Reforms, Social Reforms, Atatürk's Principles, Atatürk's Foreign Policy, Turkey in the World War II, The concept of Jeopolitics and Jeopolitics of Turkey.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Prof.Dr. Nurgün KOÇInstructor Yunus GÖKInstructor Mustafa KARACAInstructor Fatma ERTENInstructor Hamza ÜZÜMCÜInstructor Yusuf TEKE

Recommended or Required Reading

Resources 1. Armaoğlu, Fahir. (2004). 20. Yüzyıl Siyasi Tarihi. İstanbul: Alkım Yayınevi.
2. Berkes, Niyazi. (2012). Türkiye'de Çağdaşlaşma. İstanbul: YKY.
3. Candan, Ahme

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Revolutions in the field of political: Abolition of the Ottoman Sultanate; Proclamation of the Republic; Abolition of the Calipl		
2	Revolutions in the field of law; Revolutions in the field of education and culture		
3	Revolutions in the field of social life		
4	Revolutions in the field of economy and agriculture		
5	The establishment and development of the constitutional system		
6	Foreign policy and relations of Turkey (Turk foreign policy between 1923 to 1932)		
7	Foreign policy in the period of Republic: The Mosul Question, Exchange of population, Foreign school question, The entran		
8	Foreign policy in the period of Republic: The Balkan Entente, Sadabat Pact, The Montreux Convention of Straits, Hatay Que		
9	Principles of Atatürk: Republicanism, Nationalism, Populism		
10	Principles of Atatürk: Secularism, Etatism, Revolutionism		
11	Supplemental Principles		
12	Turkey after Atatürk		
13	Geopolitic and geopolitical position of Turkey		
14	General evaluation about Atatürk s Principles and History of Revolutions		
15	Mid-Term Exam		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Appreciate the significance of Turkish Revolution.
C02	Estimate Atatürk's Principles in historical perspective.
C03	List the basic qualifications of Turkish foreign policy.
C04	Assess the recent Turkish history.
C05	Review current developments by comparing them with the historical conditions.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**51**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10
C01	3	3	1	3		1	1			4
C02	3	3	1	3		1	1			4
C03	3	3	1	3		1	1			4
C04	3	3	1	3		1	1			4
C05	3	3	1	3		1	1			4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE216	Basic Electric and Electronics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE216	Basic Electric and Electronics	2	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to give basic information about electronic elements and to teach students the structures, working principles and applications of these elements.
Teaching Methods and Techniques:
Electrical Units, series and parallel circuits, avometers and oscilloscope, resistors, capacitors and coils, diode, NPN and PNP type transistors, thyristor and triac, integrated circuits, operational amplifiers, timer integrated circuits.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. M. Bahattin Çelik
Assistants:

Recommended or Required Reading

Resources Automobile electrical and electoric systems Tom Denton Hodder Headline Group,1995.,Basic Electronics, A. Çolpan H. Vural N. Bölük Ankara 1997.
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Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Electrical Units, Ohm law, Power, etc.	-	-
2	Series, parallel and mixed circuits	-	-
3	Avometres	-	-
4	Oscilloscope	-	-
5	Resistors	-	-
6	Capacitors and coils	-	-
7	RLC series circuits	-	-
8	Diodes	-	-
9	NPN and PNP type transistors	-	-
10	Studying of various circuits with transistors	-	-
11	Thyristor triac and diac	-	-
12	Operational amplifiers	-	-
13	Timer integrated circuits	-	-
14	Studing on various circuist	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Students make measurements in vehicles using basic electrical electronics knowledge and measuring instruments.
C02	Recognise the electrical and electronic systems in motor vehicles.
C03	Analysis the electric and electronic circuits.
C04	Perform electronic circuit applications.
C05	Diagnose the electric and electronic problems in the field of automotive engineering by using electrical and electronic knowledge.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	1	%20
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	1	10	10
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**98**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P11	P12
C01	2		3		4	1	1	3	4
C02		3		2	1	4	3	2	1
C03	3		1	2		5	1		3
C04	2	3	1	4	1	2	2	3	4
C05		2	1	2	2		1	4	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE218	Engineering Materials				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE218	Engineering Materials	3	2	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To give information about basic materials and material selection. To gain knowledge and application skills about destructive and non-destructive inspection methods in the determination of mechanical and physical properties of materials. To improve the properties of materials and gain information about drawing and interpretation of equilibrium diagrams.
Teaching Methods and Techniques:
Classification of materials, Atomic structure, interatomic bonds, Brafis cage and lattice systems, Crystal mistakes, X-ray analysis method, Allotropy, Mechanical properties of metals, Mechanical tests applied to materials, Publishing, Solidification, Methods of improving properties of metals, Forming mechanisms, Fe-Fe3C equilibrium diagrams, Fe- Fe3C equilibrium diagrams, TTT and equilibrium diagrams, Eutectic, eutectoid and peritectic transformations, Equilibrium diagrams of eutectic systems, Fe
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Yakup KAYAProf.Dr. Bilge DEMİRAsist Prof.Dr. Harun ÇUĞ

Recommended or Required Reading

Resources	Çeviri Dr. Mehmet Erdoğan, "", 1999

Course Category

Mathmatics and Basic Sciences	:	50	**Education**	:	0
Engineering	:	50	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Materials science and engineering, Classification of materials, Material selection and design, Atomic structure, Atomic links,		
2	Crystal and crystal structures, Simple cubic, Surface center cubic, volume center cubic, Heggonal tight packings		
3	Bravis cage and crystal systems, X-ray diffraction pattern, Allotropy		
4	Crystal defects, Zero dimension, One dimensional, two and three dimensional faults, Dislocations		
5	Shaping mechanisms; Slip, twinning, grain boundary shift.		
6	Mechanical properties of materials, Destructive test methods, Tensile, compression and creep test		
7	Impact notch and toughness, bending, fatigue, hardness test methods and fracture		
8	Midterm		
9	Publishing and publishing mechanisms, Publishing and surface finishing methods		
10	Solidification of metals, nucleation and growth of crystals, solidification errors in metals,		
11	Mechanisms for improving the properties of metals Working hardening, Precipitation hardening, Grain hardening, Cold defc		
12	Gibbs phase law, Phase calculations, Evaluation of equilibrium diagrams		
13	Equilibrium diagrams of solid solutions, eutectic, eutectoid, peritectic systems		
14	Eutectic, eutectoid and peritectic transformations on Fe-Fe3C equilibrium diagram and equilibrium diagram		
15	TTT and CCT conversion curves and triple phase diagrams		
16	final exam		
17	final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Classify engineering materials.
C02	He knows the structure of the material and can explain the ties between the materials.
C03	Know the crystallographic structure, can calculate the atomic occupancy factor.
C04	Classify crystal defects.
C05	Knows and explains the mechanisms of strength enhancement.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	14	2	28
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	3	3	9
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	3	3	9
Total Work Load			**74**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
C01	5	5	2			1					
C02	5	5	2			1					
C03	5	5	2			1					
C04	5	5	2			1					
C05	5	5	2			1					

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE208	Manufacturing Processes II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE208	Manufacturing Processes II	4	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To provide students with knowledge about hot and cold forming of metals, traditional and non-traditional metal removal processes, and to gain the ability to choose the manufacturing methods necessary for the production of a part.
Teaching Methods and Techniques:
Forming processes, principles of metal forming, hot and cold forming of metals, forging processes, forging defects, rolling processes, sheet and profile rolling, extrusion principles and types, rod and wire drawing processes, tube drawing, pipe production methods, sheet metal forming, cutting and punching processes, mold design principles, bending and folding, spinning, stretching, forming process, drawing processes, hydro-mechanical forming. Introduction to machining processes, metal cutting theory, chip formation and chip types, cutting tool materials, tool wear, surface roughness. Sawing; hand saw, band and circular saw, Screwing operations; screw types, tapping and reaming, Turning, machine types, cutting tool geometry, cutting parameters, machining time and power calculation, operation types, drilling, taper turning, threading, knurling. Milling; milling types, milling machines, cutting tools, cutting parameters, operations. Drilling, drill benches, reaming, boring. Shaper and planing operations. Broaching; broaching machines, broach design and manufacturing. Grinding processes; grinding types, surface grinding, cylindrical grinding, centerless grinding, hole grinding, stone types and properties, stone sharpening. Honing and processing principles, Lapping and its types, super finishing processes. Non-traditional machining processes; basic principles and types, electrical discharge machining; erosion theory, tool design and manufacturing, machining parameters, wire electrical discharge machining, abrasive jet machining, electrochemical machining.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Mustafa Günay
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Çapan, L. "Metallere Plastik Şekil Verme", Çağlayan Basımevi, İstanbul, (1999),Degarmo, E. P., Black, J. T., Kohser, R. A., Klamecki, B. E. Materials and Processes in Manu

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	
Engineering	:	60	**Science**	:	10
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Forming processes, principles of metal forming, hot and cold forming of metals		
2	Forging processes, forging machines, forging defects, rolling processes, sheet and profile rolling		
3	Extrusion principles and types, rod and wire drawing processes, tube drawing		
4	Pipe production methods		
5	Sheet metal forming, cutting and punching processes, mold design principles		
6	Bending and folding, spinning, stretching, forming process, drawing processes, hydro-mechanical forming		
7	Introduction to machining processes, metal cutting theory, chip formation, cutting tool materials, tool wear (Assignment de		
8	Sawing; hand saw, band and circular saw, Screwing operations; screw types, tapping and reaming		
9	Turning, machine types, cutting tool geometry, cutting parameters, machining time and power calculation, operation types		
10	Milling; milling types, milling machines, cutting tools, cutting parameters, operations		
11	Drilling, drill benches, reaming, boring. Shaper and planing operations		
12	Broaching; broaching machines, broach design and manufacturing. Grinding processes; grinding types, surface grinding, cy		
13	Non-traditional machining processes; basic principles and types		
14	Electrical discharge machining, wire electrical discharge machining, abrasive jet machining, electrochemical machining		
15	Mid-term exam for this course is done between 7-15th weeks. The weekly course schedule is postponed a week for the exa		

Course Learning Outcomes

No	Learning Outcomes
C01	Learns the principles of metal forming and can select the forming method to be applied for the manufacture of parts
C02	Understand cutting theory, cutting tool types and parameters affecting chip formation
C03	Gains the ability to select machining parameters in traditional machining methods
C04	Learn the usage requirements of non-traditional machining methods
C05	Gains the ability to choose the most suitable manufacturing method and / or methods for part production

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	12	2	24
Assignments	1	15	15
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**105**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C02						2			2			
C03				3	3							3
C04	4							4			4	
C05		5	5				5			5		

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE212	Measurement Technique				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE212	Measurement Technique	3	2	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
1.teach the measurement technique principles to students, 2.give the measurement ability to students.
Teaching Methods and Techniques:
The measurement and control. The measurement techniques. Measurement of the size, angle and area. Classic measuring and control devices. Caliper, micrometer, marking gauge, comparator, indicator, gage. Surface roughness. Hardness measurement techniques. Coordinate measuring. Measurement of viscosity, speed, torque, power and vibration. Pressure, flow and temperature measuring. Energy productivity. Uncertainty analysis. Design and reporting of the experiments.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Ahmet Emrah Erdoğdu
Assistants:

Recommended or Required Reading

Resources Genceli, O.F., 'Ölçme Tekniği: Boyut, Basınç, Akış ve Sıcaklık Ölçmeleri', Birsen Yayınevi, İstanbul, 1995,Holman, J.P., Experimental Methods for Engineers, McGraw-Hill In
-
-
-
-

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	30	**Science**	:	10
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	The description of the measurement and control. The measurement techniques.	-	-
2	Measurement devices of the size, angle, area, and measurement process.	-	-
3	Classic measurement and control devices:Caliper, micrometer and marking gauge.	-	-
4	Comparator, indicator and gage.	-	-
5	The description of surface roughness and surface roughness measurement device	-	-
6	Hardness measurement techniques.	-	-
7	Coordinate measurement device.	-	-
8	Measurements of viscosity, speed, torque, power and vibration.	-	-
9	Pressure measurement. Devices used and their functions.	-	-
10	Flow measurement. Relevant devices and their functions.	-	-
11	Temperature measurement. Devices used and their functions.	-	-
12	Energy productivity devices.	-	-
13	Uncertainty analysis.	-	-
14	Design and reporting of the experiments. Presentation of the reports.	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Upon successful completion of this course, students/learners will be able to: Obtain the measurement ability in experimental studies
C02	Define the speed, torqu and power measurement techniques.
C03	Analyze the experimental data.
C04	compute the uncertainty analysis for experimental studies.
C05	report the experimental results.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	5	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	9	3	27
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	9	9
Practice	14	1	14
Laboratory	0	0	0
Project	0	0	0
Final examination	1	12	12
Total Work Load			**90**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	3		2	3		4	1	1		2		3
C02		2		3	1			4			3	1
C03	2	1		3		4	2		2	1		3
C04			3		4		2	1		3	2	
C05	3	2			3	2		2	3		1	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE222	Numerical Analysis				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE222	Numerical Analysis	2	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To have students gain the ability of 1.Computing errors in numerical methods, 2.Solving non-linear equation systems, 3.Solving linear equation systems, 4.Computing diveded differences tables, 5.Solving interpolation problems, 6.Solving derivation and integration problems with mumerical analysis methods
Teaching Methods and Techniques:
The representation of number in computer system. Error concept, Taylor and Mclauren Series, Convergency methods to nonlinear equation system Lineer equation systems, Diveded difference, interpolation,Backward interpolation, Numerical derivative, Numerical integration, Euler, Taylor ve Runge-Kutta methods.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Mehmet Bakırcı
Assistants:

Recommended or Required Reading

Resources Numerical Methods for Engineers Seventh Edition by Steven C. Chapra and Raymond,Yakowitz S., Szidarovszky F.,An Introduction to Numerical Computations, Macmillan, Numerical Methods for Engineers Seventh Edition by Steven C. Chapra and Raymond

Course Category

Mathmatics and Basic Sciences	:	80	**Education**	:	
Engineering	:	20	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Review of Calculus: Limits and Continuity, Differentiability, Integral, Taylor Polynomial and Series		1. Richard Burden, Douglas Faires, Num
2	Round-off Errors and Computer Arithmetic		1. Richard Burden, Douglas Faires, Num
3	The Bisection Method, The Newton's Method		1. Richard Burden, Douglas Faires, Num
4	Fixed-Point Iteration Method		1. Richard Burden, Douglas Faires, Num
5	The Jacobi and Gauss-Siedel Iterative Techniques		1. Richard Burden, Douglas Faires, Num
6	Interpolation and the Lagrange Polynomial		1. Richard Burden, Douglas Faires, Num
7	Interpolation and Divided Differences		1. Richard Burden, Douglas Faires, Num
8	Midtern exam		1. Richard Burden, Douglas Faires, Num
9	Cubic Spline Interpolation, Least Squares Approximation		1. Richard Burden, Douglas Faires, Num
10	Numerical Differentiation, Richardson's Extrapolation		1. Richard Burden, Douglas Faires, Num
11	Numerical Integration, the Trapezoidal and Simpson's Rule, Romberg Integration		1. Richard Burden, Douglas Faires, Num
12	The Elementary Theory of Initial-Value Problems, Euler's Method		1. Richard Burden, Douglas Faires, Num
13	Higher-Order Taylor Methods, Runge-Kutta Methods		1. Richard Burden, Douglas Faires, Num
14	Final exam		1. Richard Burden, Douglas Faires, Num

Course Learning Outcomes

No	Learning Outcomes
C01	Perform error analysis.
C02	Calculate the roots of nonlinear equations.
C03	Compute numerical derivative and integration.
C04	Develop and Implement algorithms for numerical solutions of engineering problems.
C05	Apply numerical methods to engineering problems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	2	28
Assignments	14	2	28
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	14	1	14
Project	0	0	0
Final examination	1	2	2
Total Work Load			**102**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	5	5	3	3	3	3	3	3	3	3	3	5
C02	5	4	3	3	3	3	3	3	3	3	3	5
C03	5	3	3	3	3	3	3	3	3	3	3	5
C04	5	3	3	3	3	3	3	3	3	3	3	5
C05	5	3	3	3	3	3	3	3	3	3	3	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE214	Strength Of Materials II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE214	Strength Of Materials II	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course aims to provide mechanical engineering students with the ability to analyze stress and strain components in a structural member under different loading conditions, analyze displacement in a beam, analyze buckling in a column, and design and select suitable structural elements using the principles of mechanics.
Teaching Methods and Techniques:
Shearing Stresses in Beams and Thin-Walled Members, Transformations of Stress and Strain, Principal Stresses under a Given Loading, Deflection of Beams, Columns, Energy Methods.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:
Dr. Özden İŞBİLİR
Assistants:

Recommended or Required Reading

Resources Mechanics of Materials, 9th Edition, R.C. Hibbeler, 2013, Pearson, ISBN:978-0133254426,Mechanics of Materials, 6th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., J
Strength of Materials II course notes

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:	40	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Shear Stresses in Beams and Thin-Walled Members- Shear force on the horizontal face of a beam- Shear stress on on the l		
2	Shear Stresses in Beams and Thin-Walled Members- Longitudinal shear force on a beam with arbitrary shape- Shearing str		
3	Transformations of Stress and Strain- Transformation of plane stress- Principal stresses, maximum shearing stress- Mohr's		
4	Transformations of Stress and Strain- General state of stress- Application of Mohr's circle to the three-dimensional analysis		
5	Transformations of Stress and Strain- Stresses in thin-walled pressure vessels- Transformation of plane strain- Mohr's circle		
6	Principal Stresses under a Given Loading- Principal stresses in a beam- Design of transmission shafts		
7	Principal Stresses under a Given Loading- Stress analysis under combined loadings		
8	Deflection of Beams- Deformation of a beam under transverse loading- Equation of the elastic curve- Direct determination		
9	Deflection of Beams- Statically indeterminate beams- Method of superposition- Application of superposition to statically ind		
10	Deflection of Beams- Moment-area theorems - Bending-moment diagrams by parts- Use of moment-area theorems with st		
11	Columns- Stability of structures- Euler's formula		
12	Columns- Eccentric Loading; the Secant Formula- Design of Columns under a Centric Load- Design of Columns under an Ec		
13	Energy Methods- Strain energy- Elastic strain energy for normal stresses- Elastic strain energy for shear stresses- Strain en		
14	Energy Methods- Impact loading- Calculation of deflection using work and energy method- Calculation of deflection using C		

Recommended Optional Programme Components

MEE102 Statics
MEE203 Strength Of Materials I

Course Learning Outcomes

No	Learning Outcomes
C01	Defines stress and strain components on structural members in various directions.
C02	Determines stress and strain components under combined loading.
C03	Determines the equation of the elastic curve of a beam using different methods.
C04	Calculates buckling of a column and analyze stability.
C05	Solves mechanics problems using different energy methods.
C06	Designs and selects structural components under various loading conditions.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	5	%10
Assignment	5	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	2	26
Assignments	5	1	5
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**108**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04
All	4	5	4	4
C01	4	5	4	4
C02	4	5	4	4
C03	4	5	4	4
C04	4	5	4	4
C05	4	5	4	4
C06	4	5	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

FOL282	Technical Foreign Language II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	FOL282	Technical Foreign Language II	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
In global world ,it is too important following developed technology and new acedemic studies.By this lecture, the students can learn technical English and this enables to beter understand of acedemic issue or new design techonology. Furthermore , their translation and communication skills can improve by this way.
Teaching Methods and Techniques:
Basic technical terms of industrial engineering, systems engineering, operations research, computer engineering, hardware and network software engineering, metallurgical engineering, iron and steel casting, ceramic engineering, mechanical engineering, mechatronics and mechanic,electrical engineering, automotive engineering in English
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Şafak BAYIRAsist Prof.Dr. Suat ALTUNAsist Prof.Dr. Mustafa SEKMENAsist Prof.Dr. Murat TEKELİOĞLUAssociate Prof.Dr. İsmail KARACANAsist Prof.Dr. Celalettin BAYKARA

Recommended or Required Reading

Resources E. H. Glendinning and N. Glendinnig, "Oxford English for Electrical and Mechanical Engineering", Oxford University Press, 1995,Eugene J. Hall, "The Language of Mechanic

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic technical terms of industrial engineering in English		
2	Basic technical terms of systems engineering in English		
3	Basic technical terms of operations research in English		
4	Basic technical terms of computer engineering in English		
5	Basic technical terms of hardware and network engineering in English		
6	Basic technical terms of software engineering in English		
7	Basic technical terms of metallurgical engineering in English		
8	Basic technical terms of iron and steel casting in English		
9	Basic technical terms of ceramic engineering in English		
10	Basic technical terms of mechanical engineering in English		
11	Basic technical terms of mechatronics and mechanic in English		
12	Basic technical terms of hydromechanic and hydrolic machines in English		
13	Basic technical terms of electrical engineering in English		
14	Basic technical terms of automotive engineering in English		
15	Midterm exam is done between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	This lecture enables not only learn different occupational terms but also develope presentation skills by learning technological development with literature searching.Besides thisy, this lecture is to be a guide for work life and working area of students.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	9	9
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P07	P08
C01	5	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE220	Thermodynamics II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
4	MEE220	Thermodynamics II	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach the concepts of second law such as energy quality, entropy and exergy. To teach the second law analysis. To teach the application of the laws of thermodynamics to power and cooling cycles.
Teaching Methods and Techniques:
Clausius inequality and the definition of entropy, the principle of the increase of entropy, entropy balance for closed and open systems. Adiabatic yields. Pure substances, liquids and solids, and entropy exchange of ideal gases. Exergy, second law analysis. Gas power cycles (Otto, Diesel, Stirling, Ericsson, Brayton), steam power cycles (Rankine), Cogeneration, combined gas-steam power cycles. Refrigeration cycles (vapor compression, gaseous, absorption and thermoelectric), heat pumps.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Erhan KayabaşıProf.Dr. Kamil ArslanDr. Enes KılınçDr. Abdulrazzak AKROOT
Assistants:

Recommended or Required Reading

Resources Y.A. Cengel, M.A. Boles, Thermodynamics: an Engineering Approach 9th Edition, 2019.,M.T. Moran and H.N. Shapiro, Fundamentals of Engineering Thermodynamics
Y.A. Çengel and M.A. Boles, "Thermodynamics: An engineering approach 5th edition", McGraw-Hill, New York.

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	70	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Entropy		
2	Entropy		
3	Exergy		
4	Exergy		
5	Exergy Balance		
6	Gas power cycles		
7	Gas power cycles		
8	Midterm Exam		
9	Steam power cycles		
10	Steam power cycles		
11	Combined Power Cycles		
12	Combined Power Cycles		
13	Refrigeration cycles		
14	Refrigeration cycles		
15	Heat pumps		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Calculate and interpret the second law efficiency of thermodynamics.
C02	Knows cooling and power systems in detail.
C03	Can make thermodynamic analysis in theoretical and real cycles.
C04	Can apply exergy model to power cycles.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%50
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	10	4	40
Assignments	2	10	20
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**105**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P08	P09	P10	P11	P12
All	5	5	5	5	5	5	5	5	5	5	5
C01	5						5				
C02	5										
C03	5										
C04	5				5					5	5

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC307	Communication Skills				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC307	Communication Skills	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach base business concepts of behavioral sciences and relationships between individual, environment individuality, culture, attitude.
Teaching Methods and Techniques:
Historical development of behavioral sciences, Scientific methods of social psychology, Research techniques of social psychology, Individual and its environment, Individuality-character relationship.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Undefined Dekanlık
Assistants:

Recommended or Required Reading

Resources 1.Taylor S.E., L.A.Peplau ve D.O. Sears Social Psychology Prentice Hall New Jersey 2000, . ,

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Behavioral sciences' relationship with other social sciences		
2	Historical development of behavioral sciences		
3	Scientific methods of social psychology		
4	Research techniques of social psychology		
5	Individual and its environment		
6	Individual and its environment (continued)-Midterm exam		
7	Individuality-character relationship		
8	Individuality-character relationship		
9	Theoretical approaches to individuality		
10	Theoretical approaches to individuality (continued)		
11	Culture, education and individuality		
12	Culture, education and individuality (continued)		
13	Dimensions of attitude		
14	Measurement techniques of attitude		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	List base business concepts of behavioral sciences and relationships among individual, environment individuality, culture, attitude.
C02	Put forward an opinion about employees behaviors.
C03	Explain organizational behaviors with modern management approaches.
C04	Recognize of management (Operations Management, Marketing, Accounting, Finance, Human Resources, Quantitative Methods and Management-Organization).
C05	Work effectively in multi-disciplinary research teams
C06	Örgütsel davranış teorileri yardımı ile insan davranışları ile organizasyon arasında ilişki kurar.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01						3	4	4	4	4	4	4
C02						3	4	4	4	4	4	4
C03						3	4	4	4	4	4	4
C04						3	4	4	4	4	4	4
C05						3	4	4	4	4	4	4
C06						3	4	4	4	4	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE327	Computer Aided Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE327	Computer Aided Design	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The main objective of this course is to teach the students the basics of AutoCAD programme in 2D and 3D.
Teaching Methods and Techniques:
This course is about learning a CAD software programme to be able to draw in 2 dimension. In this course the students will learn AutoCAD sofware programme to learn how to draw an architectural drawing or any other 2 and 3 dimensional drawings.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Mehmet Erdi Korkmaz
Assistants:

Recommended or Required Reading

Resources	Rooney Joe and Steadman P. Principles Of Computer Aided Design. UCL Press Ltd, The Open University, 1994 ISBN 1-85728-222-1, Library classmark T 353 P7 Shah J.J.
	Rooney Joe and Steadman P. Principles Of Computer Aided Design. UCL Press Ltd, The Open University, 1994 ISBN 1-85728-222-1, Library classmark T 353 P7 Shah J.J.

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	30	**Science**	:	0
Engineering Design	:	30	**Health**	:	0
Social Sciences	:	0	**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction, general information about CAD, basic drawing commands		
2	Layers, editing commands		
3	Drawing a simple floor plan		
4	Drawing a simple floor plan		
5	Block editor, Wblock, Hatch settings		
6	Block editor, Wblock, Hatch settings		
7	Text, Dimensions		
8	Plotting techniques, array, align, fillet		
9	Drawing section example		
10	Keyboard shortcut settings		
11	Dynamic blocks		
12	Dynamic blocks		
13	Layout sheets		
14	Presentation techniques		

Course Learning Outcomes

No	Learning Outcomes
C01	To use dimensions on an architectural drawing.
C02	To create Traditional Architectural Design Process steps in Digital Environment,
C03	To gain knowledge about 2D digital media
C04	To gain knowledge about 3D digital media

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	7	7
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**129**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC311	Critical Analytic Thinking Techniques				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC311	Critical Analytic Thinking Techniques	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this lecture is to educate student to think in a critical way.
Teaching Methods and Techniques:
Definitions, brain as the thinking organ, Grouping thinking, optional thinking and properties, Critical and Analytical thinking.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Undefined Dekanlık
Assistants:

Recommended or Required Reading

Resources Elder L., Richard P., "", 2003

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	What is the critical and analytical thinking		
2	The brain: Organ of thought		
3	Classification of thinking		
4	The properties of voluntary and involuntary thinking		
5	The methods of voluntary and involuntary thinking		
6	Content of critical and analytical thinking		
7	Stages of critical and analytical thinking		
8	Stages of critical and analytical thinking		
9	Factors affecting critical and analytical thinking		
10	How should critical and analytical thinking be done		
11	The problem solving in critical and analytical thinking		
12	Development problem solving strategies in critical and analytical thinking		
13	Application problem solving strategies in critical and analytical thinking		
14	Providing solution to problems in critical and analytical thinking		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Sınavı Final exam		
17	Final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Ability for CAT.
C02	Increaing communication skills.
C03	Having info of CAT.
C04	CAT applications.
C05	CAT applications at mechanical engineering.
C06	Learning of thinking of voluntary.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01								3		4	2	
C02								3		4	2	
C03								3		4	2	
C04								3		4	2	
C05								3		4	2	
C06								3		4	2	

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE339	Energy Management				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE339	Energy Management	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Imparting fundamental knowledge on Energy Management
Teaching Methods and Techniques:
General definitions / General Energy Situation of Turkey and the world / General Structure of the Turkish Industry / Energy Management Principles / Energy Savings Study Methods / Energy Accounting / Measurement, Instrumentation and Process Control / Insulation / Combustion Systems of Boiler / Calculation of Boiler Efficiency / Steam Generation and Distribution Systems / Heat recovery from condensate and blowdown / Waste Heat and Environmental Impact
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources Sustainable Energy Management,-

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	60	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	General definitions		
2	General Energy Situation of Turkey and the world / General Structure of the Turkish Industry		
3	Energy Management Principles		
4	Energy Savings Study Methods / Energy Accounting		
5	Measurement, Instrumentation and Process Control		
6	Insulation		
7	Combustion Systems of Boiler		
8	Midterm		
9	Efficiency Calculations in Boilers		
10	Steam Generation and Distribution Systems		
11	Steam Generation and Distribution Systems		
12	Heat recovery from condensate and blowdown		
13	Heat recovery from condensate and blowdown		
14	Waste Heat and Environmental Impact		
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Students shall gain knowledge on energy efficiency and sustainability.
C02	To gain knowledge of energy audit.
C03	To gain knowledge on importance of measurement.
C04	To gain knowledge on importance of energy efficiency.
C05	To gain knowledge on importance of heat recovery systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**118**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC303	Engineering Economics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	CEC303	Engineering Economics	2	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Understand the importance of occupational health and safety in the context of the right to live. Emphasizing the importance of occupational health and safety in terms of employers and employees and presenting them in a structure combining theory and practice.
Teaching Methods and Techniques:
Basic concepts about Occupational Health and Safety (OHS). Basic working areas of ergonomics. Occupational safety concept. Causes of work accidents, prevention models, calculation of costs, investigation and reporting. Concept of occupational disease, types, prevention methods. Occupational safety methods in workshops and laboratories. Personal protectors and machine protectors. Fire and explosion prevention methods. Principles and objectives of first aid. OHS Legislation.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Instructor İsmail TOPRAK
Assistants:

Recommended or Required Reading

Resources Dal, J., Ergonomics For beginners, Taylor Francis, 2001.,Kroemer, K., Kroemer, H., Kroemer-Elbert, K., Ergonomics, Prentice Hall, 2nd Ed., 2000.,Kroemer, K., Office Ergo

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	10	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to occupational health and safety.		
2	Fundamentals of occupational health and safety.		
3	Factors that are harmful in the workplace.		
4	Occupational safety management systems.		
5	Chemical risk factors.		
6	Physical risk factors.		
7	Biological risk factors.		
8	Material Safety Data Sheets and Preparation.		
9	Occupational accidents and prevention policies.		
10	Risk assessment and analysis methods.		
11	Risk assessment and analysis methods.		
12	Explosions and fires: Types of combustion and fire.		
13	Types of explosion and explosion.		
14	Preparing emergencies and emergency action plan.		

Course Learning Outcomes

No	Learning Outcomes
C01	Define basic concepts related to occupational health and safety.
C02	Express the importance of occupational health and safety in the framework of the right to live.
C03	Apply legal rules and principles to existing occupational health and safety disputes.
C04	Analyze occupational health and safety problems.
C05	Can solve problems related to occupational health and safety in the workplace.
C06	Learns the principles and objectives of first aid.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**50**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	5	5	5	5	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC305	Entrepreneurship				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC305	Entrepreneurship	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To introduce set-up and development as well as knowledge of entrepreneurship on the historical and society level. The course offers students a good arena to understand what entrepreneurship is and if it is something for them.
Teaching Methods and Techniques:
The course introduces the students to the preceding and early phases of an enterprise. It provides the students with basic ideas about entrepreneurial orientation, opportunity recognition
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Prof.Dr. Refik POLAT

Recommended or Required Reading

Resources Çetindamar, Dilek, (2002) Türkiyede Girişimcilik, TÜSİAD Yayınları(Yayın No:TÜSİAD-T/2002-12/340,

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Descriptionof the role of entrepreneurship.		
2	Research in the discipline of business.		
3	Research in the discipline of business.		
4	Nature of entrepreneurship.		
5	Entrepreneurial orientation.		
6	Entrepreneurial orientation.		
7	Entrepreneurial orientation.		
8	Development of an enterprise.		
9	Development of an enterprise.		
10	Development of an enterprise.		
11	Development of an enterprise.		
12	Launching a new venture.		
13	Launching a new venture.		
14	Stories on Enterpreneurship.		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Describe the role of entrepreneurship research in the discipline of business.
C02	Comprehend the nature of entrepreneurship, entrepreneurship and entrepreneurial orientation.
C03	Comprehend entrepreneurship on EU and national level.
C04	Clarify and apply the basics of launching a new venture.
C05	Apply financial planing and product planing in the business plane.
C06	İş Planı İçinde Uretim Planları öğrenilir.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01			3	1	4	4	4	4	2	5	5	4
C02			3	1	4	4	4	4	2	5	5	4
C03			3	1	4	4	4	4	2	5	5	4
C04			3	1	4	4	4	4	2	5	5	4
C05			3	1	4	4	4	4	2	5	5	4
C06			3	1	4	4	4	4	2	5	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE301	Fluid Mechanics I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE301	Fluid Mechanics I	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To introduce basic properties and importance of fluids in engineering applications. To teach and apply basic methods employed for analysis of engineering problems involving fluids.
Teaching Methods and Techniques:
Introduction fundamental concepts and fluid properties. Description and classification of fluid motion. Fluid statics. Buoyancy and stability. Concepts of system and control volume. Derivation and application of basic equations in integral form for a control volume. Motion of fluid elements (kinematics).
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Introduction to Fluid Mechanics, D. F. Young, B. R. Munson, T. H. Okiishi and W.W. Huebsch, John Wiley & Sons, Inc.,Fluid Mechanics Fundamentals and Applications, Y

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	INTRODUCTION: Definition of fluid, fluid mechanics in engineering, scope of fluid mechanics, methods of analysis, dimensi		
2	INTRODUCTION: Definition of fluid, fluid mechanics in engineering, scope of fluid mechanics, methods of analysis, dimensi		
3	FUNDAMENTAL CONCEPTS: Definition of continuum, fluid as a continuum, velocity field, timeline,pathline, streakline and st		
4	FUNDAMENTAL CONCEPTS: Definition of continuum, fluid as a continuum, velocity field, timeline,pathline, streakline and st		
5	FUNDAMENTAL CONCEPTS: Viscosity, Newtonian and non-Newtonian fluids, vapor pressure and surface tension, descriptio		
6	FUNDAMENTAL CONCEPTS: Viscosity, Newtonian and non-Newtonian fluids, vapor pressure and surface tension, descriptio		
7	FLUID STATICS: The basic equation of fluid statics, analysis of hydrostatic force on plane submerged surfaces.		
8	FLUID STATICS: Analysis of hydrostatic force on curved submerged surfaces. Buoyancy and stability.		
9	FLUID STATICS: Analysis of hydrostatic force on curved submerged surfaces. Buoyancy and stability.		
10	FLUID STATICS: Analysis of fluids in rigid-body motion.		
11	FLUID STATICS: Analysis of fluids in rigid-body motion.		
12	DIFFERENTIAL ANALYSIS OF FLUID MOTION: Derivation of continuity equation. Stream function for two-dimensional incor		
13	DIFFERENTIAL ANALYSIS OF FLUID MOTION: Derivation of continuity equation. Stream function for two-dimensional incor		
14	DIFFERENTIAL ANALYSIS OF FLUID MOTION: Motion of fluid elements (kinematics), derivation of momentum equation.		

Course Learning Outcomes

No	Learning Outcomes
C01	Understanding of basic fluid properties and fundamental concepts of the fluid mechanics.
C02	Derivation and application of governing equation of fluid statics, and prediction of resultant hydrostatic force acting on submerged surfaces.
C03	Information about fluid particle motion (kinematic)

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	1	14
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	2	2
Practice	7	2	14
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**80**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	4	5	3	1	2	1		1			1

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE305	Heat Transfer				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE305	Heat Transfer	4	4	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Giving basic informations about heat transfer.
Teaching Methods and Techniques:
General definitions and concepts, heat transfer mechanisms, general heat equation, one-dimensional and steady heat conduction, transient heat conduction, convection heat transfer, forced convection, internal flow, external flow, natural convection, heat exchangers.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Heat and Mass Transfer: Fundamentals and Applications, 5th Edition, Yunus Cengel, Afshin Ghajar, McGraw-Hill Education, 2014.

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic of Heat Transfer: Heat transfer mechanisms, conduction, thermal conductivity, convection and radiation		
2	Heat Conduction: General heat conduction equation, boundary and initial conditions, setady one dimensional heat conducti		
3	Steady Heat Conduction: Steady heat conduction in plane walls, thermal contact resistance, generalized thermal resistance		
4	Steady Heat Conduction: Critical radius of insulation, heat transfer from finned surfaces, fin equation, fin efficiency, fin effe		
5	Transient Heat Conduction: Lumped system analysis, transient conduction in large plane walls, cylinders and spheres.		
6	Numerical Methods in Steady Conduction: Finite difference formulation of one-dimensional and two-dimensional steady hea		
7	Numerical Methods in Transient Conduction: One and two dimensional transient heat conduction, controlling numerical erro		
8	Forced Convection: Fundamentals of convection, classification of fluid flows, velocity boundary layer, thermal boundary lay		
9	Forced Convection: Fundamentals of convection, classification of fluid flows, velocity boundary layer, thermal boundary lay		
10	External Forced Convection: Drag force and heat transfer in external flow, parallel flow over flat plates, flow across cylinde		
11	Internal Forced Convection: Mean velocity, mean temperature, the entry region, constant surface heat flux and temperatur		
12	Natural Convection: Physical mechanism, natural convection over surfaces and inside enclosures, combined natural and for		
13	Thermal Radiation: Blackbody radiation, radiation intensity, radiative properties, Kirchhoff's law, atmospheric and solar radi		
14	Radiation Heat Transfer: Radiation heat transfer between black surfaces, between diffuse gray surfaces, radiation shields		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to understand the basic laws of heat transfer.
C02	Students will be able to analyze the problems related to steady heat conduction for simple geometries.
C03	Students will be able to develop solutions for transient heat conduction for simple geometries.
C04	Students will be able to make solutions for simple geometries related to natural convection.
C05	Students will be able to solve practical engineering problems by modeling heat transfer.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%5
Project	1	%5
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	2	2
Practice	7	2	14
Laboratory	0	0	0
Project	1	3	3
Final examination	1	2	2
Total Work Load			**111**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	4	5	3	1	2	1		1			1

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE399	Industrial Practice I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE399	Industrial Practice I	0	0	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Provided sufficient practical work in the field of application.
Teaching Methods and Techniques:
Predominantly working in the field of machine and manufacturing systems in a government agencies or private organizations which provide services in industrial practice
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Associate Prof.Dr. İbrahim ÇAYIROĞLU

Recommended or Required Reading

Resources Possessed resources during learning preriod,

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	30	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	10	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Recognition of the plant		
2	Studies in relevant department		
3	Studies in relevant department		
4	Work experience		
5	Work experience		
6	Work experience		
7	Work experience		
8	Work experience		
9	Work experience		
10	Work experience		
11	Work experience		
12	Work experience		
13	Work experience		
14	Work experience		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Providing industrial services in the field of computer systems and will have sufficient practical background in the field of practice.
C02	[illegible]
C03	To gain the ability of utilization of tecniques and modern means for engineering applications.
C04	To gain the ability of working in a interdisciplinary teams.
C05	To recognize the required knowledge about factory organization.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%0
Quizzes	0	%0
Assignment	1	%50
Attendance	0	%0
Practice	1	%50
Project	0	%0
Final examination	0	%0
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	1	16	16
Presentation	0	0	0
Mid-terms	0	0	0
Practice	4	34	136
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**152**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	4	4	4	4	4	3	4	3	4	2	1	2
C02	4	4	4	4	4	3	4	3	4	2	1	2
C03	4	4	4	4	4	3	4	3	4	2	1	2
C04	4	4	4	4	4	3	4	3	4	2	1	2
C05	4	4	4	4	4	3	4	3	4	2	1	2

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC309	International Communication				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC309	International Communication	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this lecture is to educate students how to communicate in the conditions of globalizing world.
Teaching Methods and Techniques:
Definiton of international communication, Purpose and Progress of International communication, a short history of international communication. Relationship between international communication to basic definitions such as economy, culture, politics. The relevance of the communication process with the process of globalization, international, technology, raw material, organization, and the transfer of the law.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Prof.Dr. Emrah DENİZ

Recommended or Required Reading

Resources	Bülbül A.R. (2000), Uluslar arası iletişim, İstanbul, Nobel Yayın Dağıtım,

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to international communicetion		
2	Communication techniques		
3	Communication techniques		
4	Using foreign languages for communication		
5	Using foreign languages for communication		
6	Using foreign languages for communication		
7	Communication Methods		
8	Communication Methods		
9	Communication Methods		
10	Communication Methods		
11	Dialogue Skills		
12	Dialogue Skills		
13	Dialogue Skills		
14	Discussions		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Define what international communication is.
C02	Improve communication skills.
C03	Explain international trading laws.
C04	Express the communication processes with the process of globalization.
C05	Uluslar arası iletişim becerisi kazanır.
C06	Küreselleşme süreci ile uluslar arası iletişim sürecini öğrenmek.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	1		2	1	4	5	2	3	3	5	5	5
C02	1		2	1	4	5	2	3	3	5	5	5
C03	1		2	1	4	5	2	3	3	5	5	5
C04	1		2	1	4	5	2	3	3	5	5	5
C05	1		2	1	4	5	2	3	3	5	5	5
C06	1		2	1	4	5	2	3	3	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC301	Labour Law				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC301	Labour Law	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach the basic concepts of labor law and employee-employer rights, basic properties of syndicates.
Teaching Methods and Techniques:
Individual Labour law: Concept of Labour Law, Sections of labour law, sources of labour law, Basics of labour law: employee, employer relationships, workplace, plant, Labor contracts and kinds, labour contracts making
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Undefined Dekanlık
Assistants:

Recommended or Required Reading

Resources Elder L. Richard P. 2003, Analytical Thinking,

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Subject of Labor Law, basic concepts and history		
2	Application fields of individual labor law		
3	Labor contract, kinds and application		
4	Labor contract, kinds and application		
5	End of labor contract		
6	Results of end of labor contract		
7	Working regulation		
8	Specifically protected groups		
9	social security of labor		
10	Short term insurances		
11	Long term insurances		
12	Social security of free workers		
13	Social security of free workers		
14	Risk groups based on labor law		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Explain labor law concepts
C02	Define concepts of labor safety and security
C03	Recognize employee-employer relationships
C04	Modify labour safest and job security
C05	Recognize labor contracts and kinds, labor contracts making
C06	İş sözleşmeleri nasıl yapılacağını açıklayabilir.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01						4	3	4	5	5	5	4
C02						4	3	4	5	5	5	4
C03						4	3	4	5	5	5	4
C04						4	3	4	5	5	5	4
C05						4	3	4	5	5	5	4
C06						4	3	4	5	5	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE303	Machine Elements I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE303	Machine Elements I	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The ability of understanding basic static and streght information, classifying machine elements with their properties, understanding working mechanisms of systems, Selectinh the proper mechine element.
Teaching Methods and Techniques:
General concepts, Fatigue, Material selection, Riveted, welded, soldered connections. Force and torque load. Connectivity and power screws. Shafts. Two-dimensional analysis. Anchor bolts, springs. Oils, sliding and rolling bearings. The worm gears, helical and worm gear. Couplings and clutches. Belt - pulley systems. Chain - gear mechanisms. Friction gears.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Associate Prof.Dr. İbrahim ÇAYIROĞLU

Recommended or Required Reading

Resources • Makine Elemanları Mustafa Akkurt,Cilt I-II, Birsen Yayınevi, İstanbul, 2005. • Makine Elemanları ve Konstrüksiyon Örnekleri Fatih C. Babalık,Uludağ Üni, 1997,

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	30	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	General concepts		
2	Fatigue		
3	Material selection		
4	Riveted, welded and soldered joints		
5	Force and torque load shafts.		
6	Screws		
7	Two-dimensional analysis		
8	Wedges and springs		
9	Friction and oils		
10	Sliding and rolling bearings		
11	Gears and worm gear mechanisms		
12	Couplings, clutches and brakes		
13	V - belt mechanisms (Giving Project 1, Turn 16 week)		
14	Chain mechanism, friction wheels (Giving Project 2, Turn 16 week)		
15	Midterm Exam, done between 7 and 15 weeks. Topics forward is taken a week after the exam.		
16	Final exam week		
17	Final exam week		

Course Learning Outcomes

No	Learning Outcomes
C01	Identify machine components and systems.
C02	Chose machine elements together with the manufacturing and desing stages.
C03	Describe welding, soldering, adhesive bonded and riveted connections.
C04	Recongize elements using in shaft-hub, pins and pin connections.
C05	Do bolt sizing and connections calculations
C06	Recognize friction, lubrication.
C07	Describe sliding bearings and rolling bearings.
C08	Describe worm gears, wormsystems,couplings, brakes, clutches, mechanisms of belt pulley.
C09	Calculate on the chain mechanisms and friction wheels

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	1	30	30
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**118**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	4	5	5	4	3	4	3	3	3	3	4	2
C02	4	5	5	4	3	4	3	3	3	3	4	2
C03	4	5	5	4	3	4	3	3	3	3	4	2
C04	4	5	5	4	3	4	3	3	3	3	4	2
C05	4	5	5	4	3	4	3	3	3	3	4	2
C06	4	5	5	4	3	4	3	3	3	3	4	2
C07	4	5	5	4	3	4	3	3	3	3	4	2
C08	4	5	5	4	3	4	3	3	3	3	4	2
C09	4	5	5	4	3	4	3	3	3	3	4	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE329	Machine Tools				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE329	Machine Tools	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Having knowledge about machine tools industry. Defining optimal and economical machine tools selection criteria according to machining process. Designing of driving systems and mechanism in machine tools according to machine tool construction. Choosing proper machine tool and equipments according to machining quality. Having knowledge about machine tools and their operation areas.
Teaching Methods and Techniques:
Classification of machine tools. Driving systems and construction of machine tools, design principles of machine tools, turning machines, milling machines, sawing machines, drilling machines, broaching machines, grinding machines, gear cutter machines, super finish machines. CNC Machinetools, Numerical Micro and nano machine tools, smart machine tools.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Ahmet Fatih Yılmaz
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Talaş Kaldırma Bilimi ve Teknolojisi CNC Takım Tezgahları ve Üretim Otomasyonu, Mustafa AKKURT, Birsen Yayınevi, 2009 Takım Tezgahları Tasarımı, Faruk MENDİ, Gazi
Talaş Kaldırma Bilimi ve Teknolojisi CNC Takım Tezgahları ve Üretim Otomasyonu, Mustafa AKKURT, Birsen Yayınevi, 2009
Takım Tezgahları Tasarımı, Faruk MENDİ, Gazi Kitapevi, 1999
Takım Tezgahları, H. Oktay BODUR, Birsen Yayınevi, 1984
Takım Tezgahları, Faruk AKÜN, İTÜ Yayınları, 1973-1978, Cilt 1 ve 2
Lecture Notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	30	**Science**	:	30
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Machine tools, basic concepts and classifications		Lecture Notes Part 1
2	Constructive structures of machine tools and elements		Lecture Notes Part 2
3	Drive systems in machine tools		Lecture Notes Part 2
4	Mechanisms in machine tools		Lecture Notes Part 2
5	Working principles of lathe and its mechanism		Lecture Notes Part 3
6	Working principles of drilling machine tool and its mechanism		Lecture Notes Part 3
7	Working principles of milling machine tool and its mechanism		Lecture Notes Part 3
8	Midterm 1		
9	Working principles grinding and superfinish machine tool, their mechanism		Lecture Notes Part 4
10	Working principles of broaching and planing machine tools and their mechanism		Lecture Notes Part 5
11	The functions, working principles and mechanisms of gear benches		Lecture Notes Part 6
12	Saw cutting machine tools and their mechanism		Lecture Notes Part 7
13	Numerical controlled machine tools- general principles		Lecture Notes Part 8
14	Accuracy in machine tools and test methods		Lecture Notes Part 9
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Gaining information about design, production and application of machine tools.
C02	Gaining inforation about turning machines, milling machines, sawing machines, drilling machines, broaching machines, grinding machines, gear cutter machines, super finish machines.
C03	Gaining ability of choosing appropriate machine tool for machining operations.
C04	Gaining knowledge about construction of machine tools and main drive mechanisms.
C05	Gaining knowledge about construction elements of machine tools.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	13	2	26
Hours for off-the-c.r.stud	13	2	26
Assignments	4	10	40
Presentation	2	8	16
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	8	8
Total Work Load			**126**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE307	Mechanisms				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE307	Mechanisms	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Solving the problems of mechanisms with the basic principles of kinematics.
Teaching Methods and Techniques:
Mechanism Technique Main Concepts, Element Pairs, Kinematic Chains, Degrees of Freedom, Mobility, Four Bar Mechanism and Grashoff's Theorem, Binding Angles, Velocities and Accelerations,Cam Mechanisms, Motion Charts, Profiles Determination of Cam, Cam mechanisms and constructions, mechanisms, Power Transmission, Special Mechanisms
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. İsmail ESEN
Assistants:

Recommended or Required Reading

Resources Mechanisms, Linkages and Mechanical Controls, Nicholas P. Chironis, Mc Graw-Hill Book Company,1995,Design of Machinery: An Introduction to the Synthesis and Analys

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to the main concepts of pairs of elements.		
2	According to the classification of construction of mechanisms, four bar linkage, slider-crank mechanism.		
3	Arm-slide mechanism, kinematics, kinematic chain, the definitions of degrees of freedom .		
4	Applications.		
5	Grubler Criteria and determining the degree of freedom of mechanisms, kinematic chain .		
6	Grashof's theorem and four-bar mechanisms.		
7	Applications.		
8	Midterm 1.		
9	Slider-Crank Mechanism, Inverted Slider-Crank Mechanism.		
10	Slider-Crank Mechanism, Inverted Slider-Crank Mechanism.		
11	Vector Loop Equations, Raven's Method, The Freudenstein Equation.		
12	Vector Loop Equations, Raven's Method, The Freudenstein Equation.		
13	General planar motion velocity and acceleration.		
14	General planar motion velocity and acceleration .		
15	Final exam.		

Course Learning Outcomes

No	Learning Outcomes
C01	To ensure the selection, development and design skills of a machine, part or process, the expected performance, manufacturing characteristics, affordability and efficiency
C02	To learn mechanism to analyze the problems encountered.
C03	To learn engineering design and analysis, such as computer software and modern methods of achieving the ability to use modern engineering techniques and knowledge
C04	To learn determination of the mechanisms in terms of high efficiency.
C05	Solving mechanism problems based on basic principles.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	1,50	19,50
Assignments	1	12	12
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**77,50**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	4	5	4	4	4	4	5	5	5	3	5
C01	2	4	3	4	4	4	4	3	3	3	5	3
C02	4	4	3	4	4	5	5	5	3	3	3	5
C03	3	4	5	5	4	4	3	3	3	5	3	4
C04	2	5	3	5	4	5	5	3	3	5	3	5
C05	2	4	4	3	4	4	4	3	5	3	3	3

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC305	Occupational Health and Safety I				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	CEC305	Occupational Health and Safety I	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Understand the importance of occupational health and safety in the context of the right to live. Emphasizing the importance of occupational health and safety in terms of employers and employees and presenting them in a structure combining theory and practice.
Teaching Methods and Techniques:
Basic concepts about Occupational Health and Safety (OHS). Basic working areas of ergonomics. Occupational safety concept. Causes of work accidents, prevention models, calculation of costs, investigation and reporting. Concept of occupational disease, types, prevention methods. Occupational safety methods in workshops and laboratories. Personal protectors and machine protectors. Fire and explosion prevention methods. Principles and objectives of first aid. OHS Legislation.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Instructor İsmail TOPRAKProf.Dr. Bilge DEMİR
Assistants:

Recommended or Required Reading

Resources	Dal, J., Ergonomics For beginners, Taylor Francis, 2001.,Kroemer, K., Kroemer, H., Kroemer-Elbert, K., Ergonomics, Prentice Hall, 2nd Ed., 2000.,Kroemer, K., Office Ergo desr sunumları

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	10	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to occupational health and safety.		
2	Fundamentals of occupational health and safety.		
3	Factors that are harmful in the workplace.		
4	Occupational safety management systems.		
5	Chemical risk factors.		
6	Physical risk factors.		
7	Biological risk factors.		
8	Material Safety Data Sheets and Preparation.		
9	Occupational accidents and prevention policies.		
10	Risk assessment and analysis methods.		
11	Risk assessment and analysis methods.		
12	Explosions and fires: Types of combustion and fire.		
13	Types of explosion and explosion.		
14	Preparing emergencies and emergency action plan.		

Course Learning Outcomes

No	Learning Outcomes
C01	Define basic concepts related to occupational health and safety.
C02	Express the importance of occupational health and safety in the framework of the right to live.
C03	Apply legal rules and principles to existing occupational health and safety disputes.
C04	Analyze occupational health and safety problems.
C05	Can solve problems related to occupational health and safety in the workplace.
C06	Learns the principles and objectives of first aid.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**50**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	5	5	5	5	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC303	Patent and Industrial Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	ESC303	Patent and Industrial Design	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
This course explores intellectual property rights, patent application for the industrial design and its examination, rights derived from industrial patents, protection of the rights of designer and patent owners, and international agreements. This course is to train student's capacity in the thinking, method, and skill in industrial design. It is expected that the students will be able to understand and grasp the logic of design process for industrial artefacts.
Teaching Methods and Techniques:
Introduction to intellectual property rights, Product design and development, Industrial design, General provisions, Patent application for the industrial design and its examination. Industrial design patent, Rights derived from industrial patents, Industrial design use, Protection of the rights of designer and patent owners, International agreements, Examination of sample patents, Preparation of a sample patent.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof. Dr. Cemal ÖZCAN

Recommended or Required Reading

Resources Eric Baker, "", Chronicle Books, 1990,Richard Stim Attorney, "", 2012,Jim Lesko, "", 2007

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	80	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	10	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to intellectual property rights		
2	Product design and development		
3	Industrial design		
4	General provisions		
5	Patent application for the industrial design and its examination		
6	Industrial design patent		
7	Rights derived from industrial patents		
8	Industrial design use		
9	Protection of the rights of designer and patent owners		
10	International agreements		
11	Examination of sample patents I		
12	Examination of sample patents II		
13	Preparation of a sample patent I		
14	Preparation of a sample patent II		
15	Mid-term exam for this course is done between 7-15th weeks. The weekly course schedule is postponed a week for the ex		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Explain quality and manufacturing relations in design
C02	Express design strategies.
C03	Classify technology production and R&D studies.
C04	Invent new idea and compose a product.
C05	Evaluate Industrial design and patent.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	1	%20
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	4	1	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01				3		4			4		4	
C02				3		4			4		4	
C03				3		4			4		4	
C04				3		4			4		4	
C05				3		4			4		4	

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE343	Project Design Principles				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE343	Project Design Principles	2	1	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to teach students the basics of conduction, convection and radiation heat transfer and to provide students to solve basic heat transfer problems using analytical solution techniques, feature tables, and related graphics.
Teaching Methods and Techniques:
Heat transfer mechanisms, general heat conduction equation, steady heat conduction, thermal resistance concept, heat transfer from finned surfaces, transient heat conduction, heat convection, and heat radiation.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Kamil ARSLANDr. Enes KILINÇ
Assistants:

Recommended or Required Reading

Resources

F. P. Incropera and D. P. DeWitt, Fundamentals of Heat and Mass Transfer, 6th Ed., John Wiley, 2007. ,Y. A. Çengel ve A. J. Ghajar, Isı ve Kütle Transferi: Esaslar ve Uyg
Y. A. Çengel ve A. J. Ghajar, Isı ve Kütle Transferi: Esaslar ve Uygulamalar, 4. Basımdan Çeviri, Çeviri Editörü: Vedat Tanyıldızı, Palme Yayınevi, 2019.
Y. A. Çengel and A. J. Ghajar, Heat and Mass Transfer: Fundamentals and Applications, 6th Ed., McGraw-Hill, 2020.
F. P. Incropera and D. P. DeWitt, Fundamentals of Heat and Mass Transfer, 6th Ed., John Wiley, 2007.

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	50	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction and basic concepts, heat transfer mechanisms: conduction, convection, and radiation.	-	-
2	One dimensional and general heat conduction equation.	-	-
3	Boundary and initial conditions, steady heat conduction in plane walls.	-	-
4	Thermal resistance concept and thermal resistance networks.	-	-
5	Heat conduction in cylinders and spheres.	-	-
6	Heat transfer from finned surfaces.	-	-
7	Transient heat conduction, lumped system analysis.	-	-
8	Midterm exam.	-	-
9	Transient heat conduction in large plane walls, long cylinders and spheres with spatial effects.	-	-
10	Fundamentals of convection.	-	-
11	External forced convection.	-	-
12	Internal forced convection.	-	-
13	Natural convection.	-	-
14	Fundamentals of thermal radiation.	-	-
15	Radiation heat transfer.	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Learns heat transfer mechanisms.
C02	Derives general heat conduction equations and reduces these equations to one and two dimensional heat transfer problems.
C03	Determines the boundary conditions for heat conduction problems and solves steady one-dimensional heat conduction problems.
C04	Gains knowledge about continuous heat conduction.
C05	Learns convection heat transfer.
C06	Learns fundamentals of radiation heat transfer.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	14	3	42
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**103**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE321		Refrigeration Technology			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	MEE321	Refrigeration Technology	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Students learn to cooling methods, cooling systems, cooling system components and refrigerants.
Teaching Methods and Techniques:
Cooling methods, basic mechanical refrigeration systems, cooling system, auxiliary elements, refrigerants and oils, household-type coolers.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources	1: KARADENİZ Y.,HOROZ İ.,COŞKUN S.,"Soğutma Tekniği ve Uygulamaları", 2: ÖZKOL N.,"Uygulamalı Soğutma Tekniği", TMMOB Makine Mühendisleri Odası 115 No'lu Ya
	1: KARADENİZ Y.,HOROZ İ.,COŞKUN S.,"Soğutma Tekniği ve Uygulamaları", 2: ÖZKOL N.,"Uygulamalı Soğutma Tekniği", TMMOB Makine Mühendisleri Odası 115 No'lu Ya

Course Category

Mathmatics and Basic Sciences	:	25	**Education**	:	
Engineering	:	25	**Science**	:	20
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definition of Refrigeration Cycles and Basic Concepts		
2	Thermodynamics II. Law and the Reverse Carnot Cycle		
3	Steam Compressed Cooling Systems		
4	Superheating and Overcooling in Vapor Compression Refrigeration Systems		
5	Progressive Compression Cooling Systems		
6	Real Cooling Cycles and Application Examples		
7	Steam Compressed Cooling System Elements and Capacity Determination		
8	Midterm		
9	Cooling Devices and Equipment		
10	Cooling Devices and Equipment		
11	Thermoelectric and Absorption Cooling		
12	Water Chillers and Evaporative Cooling		
13	Industrial and Household Cooling Devices		
14	Vehicle Air Conditioners and Refrigerated Cooling Systems		
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Student knows and explains the methods of cooling.
C02	Basic Mechanical Refrigeration staff know their duties and locations are used.
C03	Knows the structure and elements of the household type of commercial coolers.
C04	Knows characteristics of refrigerant gases.
C05	Knows protective properties of oils used in refrigeration devices and the locations used in.
C06	Learning household-type coolers.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**100**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	4	4	3	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

SEC002	Social Elective Course				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	SEC002	Social Elective Course	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

SEC001	Technical Elective Course				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	SEC001	Technical Elective Course	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

DEG305	Values Education				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
5	DEG305	Values Education	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
This course aims at providing some general information and evaluation about concepts of morals and values, literature on morals in terms of religion and philosphy, processes of getting values, models of values education and values of Turkish society.
Teaching Methods and Techniques:
The meaning of value, Definations of value and morals, brief literature on morals in terms of religion and philosophy,models of values education, schools and values education, development of ethics and character in child, values of Turkish National Education, teaching of values in schools, Values of Turkish society. Our individual values, our social values. Value erosion.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. M. Bahattin ÇELİK
Assistants:

Recommended or Required Reading

Resources
Inglehard, R., Human Values and Social Changes, Leiden: Brill, 2003.,Hamdi Kızıler, Değerler Eğitimi, KBÜ yayınları, 2019.
Inglehard, R., Human Values and Social Changes, Leiden: Brill, 2003.
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Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	30
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	60	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	The Meaning of Concept of Value The Significance of Values Education	-	-
2	The content of the values aducation		
3	The Source of Values and the Influential Factors in the Formation Process: Religion, Family and Society.	-	-
4	Culture, Education and Media.	-	-
5	Role Model in the Formation of Values. Impact of Values on Character Training	-	-
6	Individual Values (Humility, Forgiveness, Being Scientific, Courage, Generosity, Honesty, Friendship, Sensitivity, Trustworth	-	-
7	Individual Values (Credibility, Modesty, Tolerance, Virtue, Righteousness, Mercy, Hospitality, Moderation, the Spirit of Shari	-	-
8	Individual Values (Patience, Simplicity, Sincerity, Respect, Exchange Greetings, Love, Truthfulness, Thanksgiving, Thriftines	-	-
9	Social Values (Justice, Family, Freedom, Peace, Solidarity and Consciousness of Democracy).	-	-
10	Social Values (Public Consciousness of Earth's Environment, Aesthetics, Being a Ghazi, Brotherhood, Martyrdom, Public Cor	-	-
11	Erosion of Values and its Reflections Individual Reflections (Violence, Murder and Suicide, Drug Addiction, Sexuality, Ostrac	-	-
12	Erosion of Values and its Reflections Social Reflections (the Destruction of Traditional Family Structure and Alienation)	-	-
13	Erosion of Values and its Reflections Global Reflections (Social and Economic Injustice, Education and Health Inequalities)	-	-
14	Reflections on Islamic World. Reflections of Western World.	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	The student realizes his own values.
C02	It forms its own value system.
C03	Understands the importance of the concept of value.
C04	Students understand that values for peace and tranquility should be respected in society.
C05	The student knows that there is a conflict environment and injustice in societies that do not protect their values.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	4	4	16
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**48**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P08	P09	P10
All	3	5	3
C01	4	4	2
C02	4	4	2
C03	4	4	2
C04	5	5	4
C05	3	4	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE340	Basics Of Hvac				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE340	Basics Of Hvac	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Basic information about Heating ventilation and air conditioning. Installation of air conditioning systems must be considered, air velocity, temperature and relative humidity measurements conduct disclosure and explanation of concepts. To give the basics of air conditioning and project rules.
Teaching Methods and Techniques:
Thermal Comfort. Heating, ventilation and air-conditioning the relationship between. Psychrometric diagram and applications. Air conditioning. Central air conditioning units and parts. Design and calculation of air ducts. Aeration project application examples.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources R. Yamankaradeniz, İ.Horuz, S.Coşkun, Ö.Kaynaklı, N.Yamankaradeniz, İklimlendirme esasları ve Uygulamaları, Dora Yayınları, 2012. ,Klima Tesisatı, Isısan Çalıçmaları N

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	20	**Science**	:	
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	The principles of the ventilation system, indoor air quality, hygiene rules and the necessity of air conditioning.		
2	Concepts and relations related to thermal comfort and psychometry		
3	Basic Psychrometry Applications and Living Spaces and Industrial Facilities for Indoor Weather Conditions		
4	Components and Working Principles of Air Conditioning Facilities		
5	Heating Systems Components and Working Principles		
6	Psychrometric Applications of Summer Air Conditioner		
7	Psychrometric Applications of Summer Air Conditioner		
8	Midtherm Exam		
9	Psychrometric Applications of Winter Air Conditioner		
10	Psychrometric Applications of Winter Air Conditioner		
11	Heat Loss Calculation		
12	Heat Loss Calculation		
13	Heat Gain Calculation		
14	Heat Gain Calculation		
15	According to Heat Gain Calculation; Determination of Air Flow, Air Channel and System Element Capacities		

Course Learning Outcomes

No	Learning Outcomes
C01	İklimlendirmeyle learned about the basic definitions.
C02	Equipment selection and design of air-conditioning system is learned.
C03	Ventilation systems and variations learned.
C04	Ventilation can be prepared project.
C05	Air Conditioning project can draw.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	1	20	20
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**122**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE328	Cnc Programming				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE328	Cnc Programming	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To prepare the part program manually by using ISO Standard codes in CNC control systems [Fanuc, Meldas, Fagor etc.] which are widely used in industry, lathes and milling machines.
Teaching Methods and Techniques:
The most widely used CNC control systems in the industry. Differences between control systems. Programming techniques on the machine control panel. Control systems that can be programmed with ISO standard codes. Manual program development techniques and applications for CNC turning and milling machines in accordance with ISO coding system.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Gökhan SUR
Assistants:

Recommended or Required Reading

Resources 1. Gülesin, M., Güllü, A., Avcı, Ö., AKDOĞAN, G., "CNC Torna ve Freze Tezgahlarının Programlanması", Asil Yayın, Ankara, 2005.

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	0
Engineering	:	30	**Science**	:	20
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	FANUC CNC Lathes and Programming, CNC Lathe for the "G" Preparatory Functions, CNC Lathe for the "M" Miscellaneous f		
2	Cylindrical Turning Simulation and It s Applications, Taper Turning Simulation and Applications, Circular Interpolation "G02		
3	FANUC CNC milling and programming, Work Coordinate System Setting The Desired Point, Send to The Machine Zero Point		
4	FANUC Milling Cycles, Rectangular Pocket Milling Cycle, Circular Pocket Milling Cycle, Finally Return Cycle "G98 and G99," L		
5	SIEMENS CNC Lathes and Programming, Cylindrical Turning, Taper Turning, Circular Interpolation, Cycles, Rough Longitud		
6	Programming of the SIEMENS CNC Milling Machine,Slot Milling, Level Milling, Pocket Milling, Drilling and Reaming, Drilling,		
7	Cycles of SIEMENS CNC Milling Machines, Rectangular Pocket Milling Cycle, Circular Pocket Milling Cycle, Left Tapping Cycl		
8	MAZAK CNC Lathe and Programming, Cylindrical Turning, Taper Turning, Circular Interpolation, Cycles, Rough Longitudinal		
9	MAZAK CNC Milling Machines and Their Programming, Slot Milling, Level Milling, Pocket Milling, Drilling and Reaming, Drillir		
10	Cycles of MAZAK CNC Milling Machine, Rectangular Pocket Milling Cycle, Circular Pocket Milling Cycle, Left Tapping Cycle, F		
11	HEIDENHAIN for CNC Lathe Programming, Cylindrical Turning, Taper Turning, Circular Interpolation, Cycles, Rough Longitu		
12	HEIDENHAIN CNC Milling Machines and Their Programming, Slot Milling, Level Milling, Pocket Milling, Drilling and Reaming,		
13	"HEIDENHAIN for CNC Milling Machine Cycles, Rectangular Pocket Milling Cycle, Circular Pocket Milling Cycle, Left Tapping		
14	Endustrial applications		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	describe codes used in ISO coding system.
C03	write CNC programs for Fanuc, Meldas, Fagor control systems.
C05	write program for the machine part which will be manufactured in CNC turning lathe and/or milling machine.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	7	84
Assignments	1	40	40
Presentation	0	0	0
Mid-terms	1	16	16
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	24	24
Total Work Load			**206**
ECTS Credit of the Course			**8**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC318	Contemporary Topics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC318	Contemporary Topics	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach students the importance of biomedical engineering in terms of science, technology and society and to aim students to be scientific literate individuals.
Teaching Methods and Techniques:
New techniques and application areas used in biomedical engineering, the basis of personalized treatment approaches, stem cell therapy and application areas, nanotube, genetic testing and ethical paradoxes.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. İdris KABALCI
Assistants:

Recommended or Required Reading

Resources J.D. Enderle, J.D. Bronzino,Introduction to biomedical engineering,Academic Press, 2012.,N.H.C. Hwang, S.L-Y. Woo,Frontiers in Biomedical Engineering: Proceedings of t

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	10
Engineering	:	10	**Science**	:	10
Engineering Design	:	10	**Health**	:	10
Social Sciences	:	10	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	History of biomedical science.		
2	Interaction with other disciplines.		
3	Biomedical engineering in developed and developing countries.		
4	Biomedical engineering in our country.		
5	Special applications in biomedical engineering.		
6	Brain secrets, Live copy.		
7	Genetically modified organisms (GMO), Genetic copying.		
8	Viruses, Cancer biology.		
9	The importance of organ transplantation and organ donation.		
10	Chemical substances and natural chemicals, their development processes and their effects on nature.		
11	Use of nanotechnology in biomedical engineering.		
12	Use of polymer technologies in biomedical engineering.		
13	Bioinformatics.		
14	Bioinformatics.		

Course Learning Outcomes

No	Learning Outcomes
C01	Understand the importance of biomedical engineering in terms of science, technology and society.
C02	Learn the connection of biomedical engineering with current life.
C03	Students will be interested in Biomedical Engineering and will be able to follow developments in biology, medicine and engineering and gain critical thinking skills.
C04	Describes the fields of application of individual drug therapy and nanoparticles.
C05	List the new techniques and application areas used in Biomedical Engineering.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	1	1
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**49**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	5	5	5	5	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC310	Corporate Behavior				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC310	Corporate Behavior	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to introduce technical and humanistic aspects of industrial R&D and R&D management and to explain importance of technology, impacts of technology and permanent development of technology.
Teaching Methods and Techniques:
Configuration of technology and industry. Adventages of technology and competition. Technologic options, strategies and analitic tools. Partnerships and strategic agreements. Technology and structure. Technology and process. Technology and culture. Technology and total quality. Technology transfers. R&D management. R&D productivity. National politics and and R&D. Technoparks and innovational organizastions. University-industry R&D association. Patents and legal regulations. R&D trends.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof. Dr. Ozan BÜYÜKYILMAZ

Recommended or Required Reading

Resources 1. ÖRGEV M., ŞENTURAN Ş. , (2007),
2. Temel İşletmecilik Bilgileri, İstanbul,. Türkmen Kitabevi. MUCUK İ., (2003)
3. Modern İşletmecilik, İstanbul, Türkmen K

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Configuration of technology and industry		
2	Adventages of technology and competition		
3	Technologic options, strategies and analitic tools		
4	Partnerships and strategic agreements		
5	Technology and structure		
6	Technology and process		
7	Technology and culture		
8	Technology and total quality		
9	Technology transfers		
10	Creativeness and change		
11	Creativeness and change		
12	National politics and and R&D		
13	Technoparks and innovational organizastions. University-industry R&D association.		
14	Patents and legal regulations. R&D trends		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Recognize R&D, R&D management and R&D techniques.
C02	Explain R&D concepts and differences between R&D concepts.
C03	Memorize princeples for establishing R&D management system.
C04	Employ in-house R&D management.
C05	Recognize patents and legal regulations

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01					3	4	5	5	5	5	4	4
C02					3	4	5	5	5	5	4	4
C03					3	4	5	5	5	5	4	4
C04					3	4	5	5	5	5	4	4
C05					3	4	5	5	5	5	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE308	Dynamics Of Machinery				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE308	Dynamics Of Machinery	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The goal of this course is to record students with an understanding of basic concepts in the machine theory.
Teaching Methods and Techniques:
It expresses mechanism, machine descriptions, the basic elements of the transaction types are the basic mechanisms, mechanisms and machines units (arm mechanisms, crank-biyel makanizmaları, etc.). Mechanisms of freedom. Machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechanisms, balancing, balancing. Return to düzgünsüzlüğü and the flywheel; return düzgünsüzlüğü, volanın needs to be resized. Mechanical vibrations; Single-grade, sönümlü-sönümsüz degrees of freedom, free and forced vibration isolation, vibration study of the movements. Torsional vibrations.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. İsmail ESEN
Assistants:

Recommended or Required Reading

Resources 1)John Uicker, Gordon Pennock and Joseph Shigley, Theory of Machines and Mechanisms
2)E. Söylemez, "Mechanisms", METU Publication No.64, 2000.,

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	40	**Science**	:	0
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	the basic elements of the mechanism, machine descriptions, mechanisms, mechanisms to transaction types and basic mecl		
2	the basic elements of the mechanism, machine descriptions, mechanisms, mechanisms to transaction types and basic mecl		
3	General degrees of freedom.		
4	General degrees of freedom.		
5	General degrees of freedom.		
6	machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechani		
7	machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechani		
8	Midterm week		
9	machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechani		
10	return to the düzgünsüzlüğü and the flywheel; return düzgünsüzlüğü, volanın needs to be resized.		
11	return to the düzgünsüzlüğü and the flywheel; return düzgünsüzlüğü, volanın needs to be resized.		
12	return to the düzgünsüzlüğü and the flywheel; return düzgünsüzlüğü, volanın needs to be resized.		
13	mechanical vibrations; Single-grade, sönümlü-sönümsüz degrees of freedom, free and forced vibration isolation, vibration s		
14	mechanical vibrations; Single-grade, sönümlü-sönümsüz degrees of freedom, free and forced vibration isolation, vibration s		
15	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	analyze the basic elements of the mechanism, machine descriptions, mechanisms, mechanisms to transaction types and basic mechanisms (arm mechanisms, crank-biyel makanizmaları, etc.).
C02	learn general degrees of freedom.
C03	describe machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechanisms, balancing, balancing.
C04	return to the düzgünsüzlüğü and the flywheel; return düzgünsüzlüğü, volanın needs to be resized.
C05	Mekanik titreşimler; Tek serbestlik dereceli, sönümlü-sönümsüz, serbest ve zorlanmış titreşim hareketlerinin incelenmesi, titreşim izolasyonu. Burulma titreşimleri.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	1	14	14
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**102**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	4	5	2	2	2	3	3	3	4	2	4
C01	3	4	5	2	2	2	2	3	3	5	1	3
C02	3	4	5	2	2	5	4	3	3	4	2	4
C03	3	4	5	2	2	3	5	3	3	4	2	3
C04	3	4	5	2	2	2	2	3	3	3	3	4
C05	3	4	5	2	2	3	4	3	3	2	3	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE350	Engineering Ethics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE350	Engineering Ethics	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
This course aims to provide students an interactive study of ethical theory and development of engineering ethics
Teaching Methods and Techniques:
What Is Ethics? Ethics in the Business World, Including Ethical Considerations in Decision Making, Ethics in Information Technology, Ethics for IT Workers and IT Users, Computer and Internet Crime, Privacy, Freedom of Expression, Intellectual Property, Software Development, The Impact of Information Technology on Productivity and Quality of Life, Social Networking, Ethics of IT Organizations
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Oğuzhan MENEMENCİOĞLU
Assistants:

Recommended or Required Reading

Resources
Engineering Ethics: Concepts and Cases, by Charles E. Harris, Michael S. Pritchard, and Michael J. Rabins, Wadsworth, 4th Edition.,Ethics in Information Technology, by G
Ethics in Information Technology, by George W. Reynolds, Cengage Learning, Inc, 4-5th Edition.
Engineering Ethics: Concepts and Cases, by Charles E. Harris, Michael S. Pritchard, and Michael J. Rabins, Wadsworth, 4th Edition.

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	: 30	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	: 40	**Field**	: 30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	What Is Ethics? Ethics in the Business World, Including Ethical Considerations in Decision Making, Ethics in Information Tec		
2	What Is Ethics? Ethics in the Business World, Including Ethical Considerations in Decision Making, Ethics in Information Tec		
3	Ethics for IT Workers and IT Users		
4	Ethics for IT Workers and IT Users		
5	Computer and Internet Crime		
6	Computer and Internet Crime		
7	Privacy		
8	Privacy		
9	Freedom of Expression		
10	Intellectual Property		
11	Software Development		
12	The Impact of Information Technology on Productivity and Quality of Life		
13	Social Networking		
14	Ethics of IT Organizations		

Course Learning Outcomes

No	Learning Outcomes
C01	Describe a clear definition of ethics
C02	Describe a clear definition of engineering ethics
C03	To develop understanding of the ethical issues that engineers often face in professional practice
C04	To develop appreciation and ability about ethical issues
C05	Explain the importance of professional ethics as an engineer

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%40
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%110**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	2	14	28
Hours for off-the-c.r.stud	2	12	24
Assignments	1	5	5
Presentation	1	10	10
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**87**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE302	Fluid Mechanics II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE302	Fluid Mechanics II	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Teach derivation and application of basic equations in differential form governing the fluid motion, solution of differential equations to find velocity distribution, calculation of forces exerted by flows on bodies.
Teaching Methods and Techniques:
Bernoulli and energy equations. Momentum equations. Dimensional analysis and modeling. Incompressible viscous flow, Navier-Stokes equations. Boundary layer in laminar and turbulent flow. Incompressible flows and solutions in ducts. Flow around immersed bodies. Introduction to compressible flow.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Introduction to Fluid Mechanics, D. F. Young, B. R. Munson, T. H. Okiishi and W.W. Huebsch, John Wiley & Sons, Inc.,Fluid Mechanics Fundamentals and Applications, Y

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	BERNOULLI EQUATION		
2	ENERGY EQUATION		
3	LINEAR MOMENTUM EQUATION		
4	LINEAR MOMENTUM EQUATION		
5	ANGULAR MOMENTUM EQUATION		
6	ANGULAR MOMENTUM EQUATION		
7	DIMENSIONAL ANALYSIS AND MODELING		
8	DIMENSIONAL ANALYSIS AND MODELING		
9	INTERNAL FLOW		
10	INTERNAL FLOW		
11	INTERNAL FLOW		
12	EXTERNAL FLOW: DRAG AND L		
13	EXTERNAL FLOW: DRAG AND L		
14	COMPRESSIBLE FLOW		

Course Learning Outcomes

No	Learning Outcomes
C01	Learns to use Bernoulli and Energy equations.
C02	Calculate the forces and moments applied to the body by the fluid.
C03	Have knowledge about the compressible flow subject.
C04	Gains knowledge of dimensional analysis and modeling.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	1	14
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	2	2
Practice	7	2	14
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**80**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	4	5	3	1	2	1		1			1

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC304	Human Resources Management				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC304	Human Resources Management	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
It is aimed that students have recognition of principles like conditionality, being scientific and being historical while evaluating cases and problems. •It is aimed that students have ability to function on a project as a team member or leader. •Improving the ability of oral and written communication. •It is aimed that students have recognition of universal values like reconciliation, change and sharing. •It is aimed that students have ability to analyze, explain and solve the problems
Teaching Methods and Techniques:
Personnel management, definitions and scope. Relationship with other sciences. Personnel problems and solutions. Personnel control. Human resources (internal resourcing and outsourcing). Work load analysis. Workforce analysis. Personnel evaluation methods. Personnel education and development. Work evaluation techniques. Wage systems. Motivation. Leardership. Complaint mechanism. Communication. Discipline. Health and protection.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Hakan TAHTACI

Recommended or Required Reading

Resources 1. Yıldız,. Gültekin. İnsan Kaynakları Yönetimi,
2. International Finance Investment Management Consulting CO. (FCC), Ankara -Sabuncuoğlu,
3. İnsan Kaynakla

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Personnel management, definitions and scope. Relationship with other sciences.		
2	Personnel problems and solutions.		
3	Personnel function organization.		
4	Personnel control.		
5	Human resources (internal resourcing and outsourcing)		
6	Work load analysis		
7	Work load analysis		
8	Personnel evaluation methods		
9	Personnel education and development		
10	Work evaluation techniques		
11	Wage systems		
12	Motivation. Leardership		
13	Complaint mechanism. Communication. Discipline		
14	Health and protection		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Explain development and purpose of human resources concept.
C02	Recognize of basic functions of human resources management.
C03	Identify of human resources information systems.
C04	Comprehending the importance of human resources management for organizations.
C05	Explain and solve the problems related to human resources.
C06	Explain health and protection.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01					5	5	4	4	3	5	3	3
C02					5	5	4	4	3	5	3	3
C03					5	5	4	4	3	5	3	3
C04					5	5	4	4	3	5	3	3
C05					5	5	4	4	3	5	3	3
C06					5	5	4	4	3	5	3	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE342	Hydraulics and Pneumatics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE342	Hydraulics and Pneumatics	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The use of a technological necessity of hydraulic and elektrohidrolik in the sector of many systems of recognition of closely, the theoretical and practical information system design, design and make it available.
Teaching Methods and Techniques:
Introduction to hydraulics, basic principles in hydraulics, standard symbols in hydraulics, hydraulic pipes and hoses, hydraulic pumps, hydraulic motors, hydraulic cylinders, sealing elements, hydraulic valves, oil reservoir, filters, hydraulic accumulators, hydraulic fluids, electro-hydraulic systems, error in hydraulic systems search, application areas of hydraulic systems in industry, hydraulic and electrohydraulic circuit applications.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. M. Bahattin Çelik
Assistants:

Recommended or Required Reading

Resources H.Exner, R.-İ. (1991). Basic Principles And Components Of Fluid Technology. Lohr: Mannesmann Rexroth Ag.,D. Merkle, B. (1996). Hydraulics, İstanbul: Festo Didactic Tü

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	0
Engineering	:	30	**Science**	:	10
Engineering Design	:	20	**Health**	:	0
Social Sciences	:	0	**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to hydraulic.		
2	Basic principles of hydraulic.		
3	Hydraulic standard symbols.		
4	Hydraulic pipes and hoses.		
5	Hydraulic pumps.		
6	Hydraulic motors.		
7	Hydraulic cylinders, sealing elements.		
8	Midterm exam.		
9	Hydraulic valves, oil tank and filters.		
10	Hydraulic accumulator and fluid.		
11	Electro-hydraulic systems.		
12	Hydraulic systems fault search.		
13	Hydraulic systems application areas in the industry.		
14	Hydraulic and electro-hydraulic circuit applications.		
15	Hydraulic and electro-hydraulic circuit applications.		
16	Final exam.		

Course Learning Outcomes

No	Learning Outcomes
C01	They know the basic principles of hydraulic.
C02	They recognize the standard symbols of hydraulic.
C03	Categorize hydraulic pumps.
C04	Chooses suitable hydraulic motors for the job.
C05	They make hydraulic and electro-hydraulic circuit applications.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	1	10	10
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**100**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
C01	5	5	5	5	5	4	1	3	2	2	
C02	5		5		5	4		3	2	2	1
C03	5	5	5	5	5		1		2		1
C04		5	5	5		4	1	3	2	2	1
C05	5	5	5	5	5	4	1	3		2	1

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE344	Industrial and Residential Energy Efficiency				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE344	Industrial and Residential Energy Efficiency	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to teach students energy saving methods in industry and buildings and to enable students to conduct energy audits in industry and buildings using analytical solution techniques and related data.
Teaching Methods and Techniques:
Energy audit services, fired systems, energy and mass balances, waste heat recovery, energy saving methods in boilers, electric motors, pumps and fans, compressed air systems, and lighting, steam systems, thermal insulation in industry and building envelope, and cogeneration systems.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Yaşar YETİŞKENDr. Enes KILINÇ
Assistants:

Recommended or Required Reading

Resources	Sanayide Enerji Yönetimi Esasları, Cilt: 1, 2, 3, 4, T.C. Enerji ve Tabii Kaynaklar Bakanlığı Enerji İşleri Genel Müdürlüğü, 2018. ,W. C. Turner, Energy Management Handbo Sanayide Enerji Yönetimi Esasları, Cilt: 1, 2, 3, 4, T.C. Enerji ve Tabii Kaynaklar Bakanlığı Enerji İşleri Genel Müdürlüğü, 2018. W. C. Turner, Energy Management Handbook, 5th Ed., Fairmont Press, 2005.

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	60	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to energy efficiency, energy auditing services.	-	-
2	Fuels and combustion, fired systems.	-	-
3	Energy and mass balances.	-	-
4	Waste heat recovery.	-	-
5	Increasing energy efficiency in boilers.	-	-
6	Increasing energy efficiency in boilers.	-	-
7	Steam systems.	-	-
8	Midterm exam.	-	-
9	Industrial insulation and building envelope.	-	-
10	Industrial insulation and building envelope.	-	-
11	Energy efficiency in electric motors.	-	-
12	Energy efficiency in pumps and fans.	-	-
13	Compressed air systems.	-	-
14	Lighting efficiency.	-	-
15	Cogeneration systems.	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Learn energy auditing services.
C02	Have knowledge about fired systems and waste heat recovery.
C03	Learn and apply energy saving methods in boilers, electric motors, pumps and fans, compressed air systems, and lighting.
C04	Have knowledge about steam systems, thermal insulation in industry and building envelope, and cogeneration systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	1	%0
Project	1	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	14	1	14
Laboratory	0	0	0
Project	2	10	20
Final examination	1	2	2
Total Work Load			**122**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE330	Introduction To Finite Element Analysis				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE330	Introduction To Finite Element Analysis	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach different methods of solution of engineering problems by finite elements method.
Teaching Methods and Techniques:
Introduction to the finite element method, Element types, Spring and beam elements, Plane stress and plane strain elements. Expression of the geometry and element behavior function. Theory of interpolation functions and acquisition methods.Addition procedures and Joining the boundary conditions to system equations, Error and convergence analysis. Developing the stiffness matrix and load vector. Isoparametric finite elements, Computer applications. Developing progam in FORTRAN and computer application.Presentation of ANSYS finite element analysis program. Solution of various type of construction problems with the help of this program (Static analysis of beams and plates, static analysis of plane and space frame system).
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Prof.Dr. Ahmet DEMİR

Recommended or Required Reading

Resources • M.YASAR "ANSYS 11.0 Notes", Karabük • Erdogan Madenci,Ibrahim Guven, "THE FINITE ELEMENT METHOD AND APPLICATIONS IN ENGINEERING USING ANSYS", The

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	30	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Fundamentals of Finite Element Method		
2	Element Types and Shape Functions (Submission homework 1)		
3	Parametric Elements (Submission homework 2)		
4	Time-dependent problems (Submission homework 3)		
5	Finite Element Formulation (Submission homework 4)		
6	Adaptation of the Finite Element Method to PC (Submission homework 5)		
7	Addition procedures (Submission homework 6)		
8	Joining the boundary conditions to system equations		
9	Addition procedures and Joining the boundary conditions to system equations (Submission homework 7)		
10	Error and convergence analysis. (Submission homework 8)		
11	Developing the stiffness matrix and load vector (Submission homework 9)		
12	Isoparametric finite elements (Submission homework 10)		
13	Developing progam in C# and computer application. (Given project 1)		
14	Ansys package program presentation (Given project 2)		
15	Midterm Exam, done between 7 and 15 weeks. Topics forward is taken a week after the exam.		
16	Final exam week (Submission projects)		
17	Final exam week		

Course Learning Outcomes

No	Learning Outcomes
C01	Recognize the finite element method used in various engineering fields.
C02	Solve various engineering problems using finite element method.
C03	Develop computer programmes needed in the application of this method.
C04	Sonlu Elemanlar Yöntemi ile çözüm yapan paket programları kullanabilir.
C05	Kullanılan Paket programlar ile proje geliştirebilir.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	0	%0
Project	1	%20
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	0	0	0
Assignments	10	2	20
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	2	8	16
Final examination	1	16	16
Total Work Load			**102**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE348	Machine Elements II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE348	Machine Elements II	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of the course is providing basics of designing, construction and analysis of mechanical elements in manufacturing of machines.
Teaching Methods and Techniques:
Couplings and Clutches, Gear Mechanisms, Tribology, Journal Bearings, Rolling Bearings
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. Okan ÜNAL
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources
Fundamentals of Machine Elements: Schmid, Steven R,Shigley's Mechanical Engineering Design
Shigley's Mechanical Engineering Design
Shigley's Mechanical Engineering Design Book

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Couplings and Clutches / Couplings		
2	Couplings and Clutches / Classification of Clutches		
3	Couplings and Clutches / Force-Torque Analysis of Clutches		
4	Gear Mechanisms / Classifications and Characteristics		
5	Gear Mechanisms / Force-Torque Analysis		
6	Gear Mechanisms / Spur Gears		
7	Gear Mechanisms / Helical Gears		
8	Gear Mechanisms / Bevel and Worm Gears		
9	Midterm Exam		
10	Tribology / Friction		
11	Wear and Lubrication		
12	Journal Bearings / Fundamentals of Journal Bearings		
13	Journal Bearings / Computational Methods of Journal Bearings		
14	Rolling Bearings / Fundamentals of Rolling Bearings		
15	Rolling Bearings / Computational Methods of Rolling Bearings		
16	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Ability of stress analysis of machine elements
C02	Designing of machine elements
C03	Making connections between machine elements
C04	Investigating tribological behaviours of machine elements
C05	Improving mechanical properties of materials of machine elements
C06	Preparing machine element projects and technical drawings
C07	Manufacturing prototypes of machine elements for industrial applications
C08	Ability of computer aided modelling of machine elements and software applications

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	4	6	24
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**110**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	4	3	5	2	3	4	5	4	4	4	5	4
C02	3	5	4	2	5	4	5	4	2	3	5	3
C03	5	2	5	5	5	5	4	4	2	5	3	5
C04	4	4	4	4	4	4	5	5	5	5	5	5
C05	4	5	5	5	4	4	4	5	4	3	3	3
C06	4	3	4	3	4	5	5	4	5	4	2	3
C07	4	4	5	2	5	4	5	4	2	5	5	3
C08	5	5	5	4	4	4	2	5	4	5	4	3

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC306	Management Systems				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC306	Management Systems	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach scientific knowledge and abilities for managing production and service systems
Teaching Methods and Techniques:
Definition of management. Historical development of management concept. Definition, and types of organization. Organization charts. Managemant of information, learning, culture, structure, continuity, power and politics in organizations. Management etics. Gender and management. Management functions (planning, organising, carrying out, coordination, auditing). New management techniques. Management with objectives. Management according to exceptions. Quality control chambers. Benchmarking. Management of change. Strategic management. Relationships between organizations.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Undefined Dekanlık
Assistants:

Recommended or Required Reading

Resources 1. Chelsom, J. V., Payne, A. C., Reavill, R. P., Management for Engineers, Scientists and Technologists, 2004,
2. Salvendy, G., Handbook og Industrial Engineering, \

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definition of management.		
2	Historical development of management concept.		
3	Definition, and types of organization. Organization charts and divisions		
4	Definition, and types of organization. Organization charts and divisions		
5	Managemant of information, learning, culture, structure, continuity, power and politics in organizations		
6	Management etics		
7	Management functions (planning, organising, carrying out, coordination, auditing)		
8	Management functions (planning, organising, carrying out, coordination, auditing)		
9	New management techniques		
10	Management with objectives		
11	Management according to exceptions		
12	Quality control chambers		
13	Benchmarking. Management of change. Strategic management		
14	Relationships between organizations		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Attain capability of managing production and service systems.
C02	Solve the problems about managing production and service systems.
C03	Form authority and responsibility consciousness.
C04	Explain leader skills, manager skills.
C05	Distinguish relationships between organizations.
C06	[illegible]

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%35
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	10	1	10
Assignments	1	4	4
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01					5	5	5	5	5	5	4	4
C02					5	5	5	5	5	5	4	4
C03					5	5	5	5	5	5	4	4
C04					5	5	5	5	5	5	4	4
C05					5	5	5	5	5	5	4	4
C06					5	5	5	5	5	5	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

CEC306	Occupational Health and Safety II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	CEC306	Occupational Health and Safety II	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
Understand the importance of occupational health and safety in the context of the right to live. Emphasizing the importance of occupational health and safety in terms of employers and employees and presenting them in a structure combining theory and practice.
Teaching Methods and Techniques:
Basic concepts about Occupational Health and Safety (OHS). Basic working areas of ergonomics. Occupational safety concept. Causes of work accidents, prevention models, calculation of costs, investigation and reporting. Concept of occupational disease, types, prevention methods. Occupational safety methods in workshops and laboratories. Personal protectors and machine protectors. Fire and explosion prevention methods. Principles and objectives of first aid. OHS Legislation.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Instructor İsmail TOPRAK
Assistants:

Recommended or Required Reading

Resources Goetsch, D. L., Industrial Safety and Health: In the Age of High Technology, MacMillan Pub., 1993.,Dal, J., Ergonomics For beginners, Taylor Francis, 2001.,Karwowski, W

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	0	**Health**	:	0
Social Sciences	:	10	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basics of occupational safety, occupational safety culture, related laws and regulations.		
2	Legal rights and responsibilities.		
3	Danger-Risk concept, protection of accidents.		
4	Major industrial accidents and large industrial enterprises: Examples of major industrial accidents related to fire, explosion		
5	Occupational diseases.		
6	Occupational health, work safety committees and duties established in the workplaces, SSK and health services.		
7	Toxicology: Toxic substances to be taken into the body, excretion and effects.		
8	Ergonomics and parameters.		
9	Working at height.		
10	Personal protective equipment.		
11	First aid and emergency.		
12	Working with display tools.		
13	Ventilation and air conditioning principles.		
14	OHS ethics.		

Course Learning Outcomes

No	Learning Outcomes
C01	Define basic concepts related to occupational health and safety.
C02	Express the importance of occupational health and safety in the framework of the right to live.
C03	Apply legal rules and principles to existing occupational health and safety disputes.
C04	Analyze occupational health and safety problems.
C05	Can solve problems related to occupational health and safety in the workplace.
C06	Learns the principles and objectives of first aid.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**50**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	5	5	5	5	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE336		Renewable Energy Resources			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE336	Renewable Energy Resources	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is about the scientific understanding of renewable energy sources and related analysis to teach
Teaching Methods and Techniques:
Principles of renewable energy, Essentials of fluid Dynamics, Solar Energy, Photovoltaic systems, Hydro energy, Wind energy, Biomass and Biofuels, Wave energy, Geotermal energy, Energy systems, storoge and transmission
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Emrah Deniz
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources 1-ACAR, M. (2007). Alternatif Enerji Kaynakları. İstanbul: Nobel Yayın Dağıtım. 2-ŞEN, Z. (2002). Temiz Enerji Kaynakları. Ankara: Su Vakfı Yayınları
J Twidell and T. Weir, 2006, "Renewable Energy Resources",Taylor &Francis -Edited by Godfrey Boyle, 2004, "Renewable Energy: Power for a Sustainable Future", Oxforf

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	30	**Science**	:	20
Engineering Design	:	20	**Health**	:	0
Social Sciences	:	10	**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to principles of renewable energy, specific principles of renewable energy		
2	Introduction to essentials of fluids dynamics, conservation of energy, conservation of momentum		
3	Viscosity, flow in pipe		
4	Heat transfer, heat circuit analysis and terminology		
5	Heat conduction, convection, heat transfer by mass transport		
6	Introduction to solar cell, extraterrestrial solar radiation, geometry of Earth and Sun		
7	Geometry of collector, Effects of the Earth's atmosphere, measurement of solar radiation		
8	Midterm		
9	Introduction to photovoltaic systems, photovoltaic systems and applications		
10	Introduction to hydro-energy, principles, Hydroelectric systems, social and environmental aspects.		
11	Introduction to wind power energy, turbine types, electricity generation and mechanical power		
12	Biomass and biofuels, biofuels classification, biomass production, social and environmental aspects		
13	Wave energy, wave motion, wave power		
14	Geothermal energy; energy systems, storage		
15	Biological and chemical storage, Heat storage, electrical storage: batteries and accumulator, distribution energy, electrical		
16	Final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Being able to learn energy concept and energy sustainability.
C02	Being able to the apply basic principles of physics to renewable energy technology
C03	Being able to learn the basic concepts of fluid mechanics
C04	Being able to learn the basic concepts of conservation of energy
C05	Being able to understand the relationship between energy resources and the environment

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	1	%0
Project	1	%20
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	3	14	42
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	30	30
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	30	30
Total Work Load			**102**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	3	3	4	4	3	2	3	3	4	4	4
C01	4	3	3	4	4	3	2	3	3	4	4	4
C02	4	3	3	4	4	3	2	3	3	4	4	4
C03	4	3	3	4	4	3	2	3	3	4	4	4
C04	4	3	3	4	4	3	2	3	3	4	4	4
C05	4	3	3	4	4	3	2	3	3	4	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC302	Research and Presentation Skills				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC302	Research and Presentation Skills	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to teach scientific research and analysizing techniques and to teach the use of obtaining data and presentation of obtaining data.
Teaching Methods and Techniques:
Scientific research and analysis techniques. Data collecting and data analyisis according to scientific research techniques. Reporting the results of researchs according to report writing techniques. Presentation of research subjects. The use of presentation equipments and technologies.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Yasin DÖNMEZAssociate Prof.Dr. Fatma Zehra TANAsist Prof.Dr. Hilal UYGURTÜRK

Recommended or Required Reading

Resources Karasar, Niyazi. (1996) Bilimsel Araştırma Yöntemleri, 8. Bs, Ankara, 3 A Araş. Yayını. Kaptan, Saim. (1973). Bilimsel Araştırma Teknikleri, Ankara, Ayyıldız Mat. Rıkan, Rau

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Scientific research and analysis techniques		
2	Scientific research and analysis techniques		
3	Scientific research and analysis techniques		
4	Data collecting and data analyisis according to scientific research techniques		
5	Data collecting and data analyisis according to scientific research techniques		
6	Data collecting and data analyisis according to scientific research techniques		
7	Reporting the results of researchs according to report writing techniques		
8	Reporting the results of researchs according to report writing techniques		
9	Reporting the results of researchs according to report writing techniques		
10	Reporting the results of researchs according to report writing techniques		
11	Presentation of research subjects		
12	Presentation of research subjects		
13	The use of presentation equipments and technologies		
14	The use of presentation equipments and technologies		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Carry out scientific research and analysis.
C02	Represent effectively obtaning results both in school life and business life.
C03	Recognize ethics in research activities.
C04	Use literatür for scientific research.
C05	Prepare an effective presentation.
C06	Present research subjects

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	4	4
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	6	6
Total Work Load			**50**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	1	1	4	1	5	5	5	5	5	4	3	3
C02	1	1	4	1	5	5	5	5	5	4	3	3
C03	1	1	4	1	5	5	5	5	5	4	3	3
C04	1	1	4	1	5	5	5	5	5	4	3	3
C05	1	1	4	1	5	5	5	5	5	4	3	3
C06	1	1	4	1	5	5	5	5	5	4	3	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE346	Robotics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE346	Robotics	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The objective of this course is to educate mechanical engineering students on fundamentals of robot construction, robot mechanisms and solving kinematic and dynamic equations belong to them.
Teaching Methods and Techniques:
The objective of this course is to educate mechanical engineering students on fundamentals of robot construction, robot mechanisms and solving kinematic and dynamic equations belong to them.
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. İsmail ESEN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Robotics for Engineers, Yoram Koren, McGraw Hill

Course Category

Mathmatics and Basic Sciences	: 20		**Education**	:	
Engineering	: 50		**Science**	: 10	
Engineering Design	: 10		**Health**	:	
Social Sciences	:		**Field**	: 10	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Robot Description and Types of Robot Controlling		
2	Classification of Robots.		
3	Usage of Robots in the Industry.		
4	Manipulation Methods in Robot Construction.		
5	Motion Transport Parts.		
6	Wrist Mechanisms and Other Construction Parts.		
7	Classification and Selection of Robot Sensors.		
8	Midterm exam.		
9	Kinematic Analysis.		
10	Kinematic Analysis.		
11	Inverse Kinematic Analysis.		
12	Inverse Kinematic Analysis.		
13	Path Planning.		
14	Controlling of Robots.		
15	Final exam.		

Course Learning Outcomes

No	Learning Outcomes
C01	It can make mechanical design for industrial robotic systems.
C02	Knows kinematic and dynamic properties of mechanical, hydraulic and pneumatic motion elements.
C03	It can select the driving, transmitting and laying elements used in robotic systems.
C04	t makes kinematic analysis of robotic manipulators with all kinds of open and closed kinematic chains.
C05	It can do end and joint trajectory planning of robotic systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	1	%10
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	3	42
Assignments	1	36	36
Presentation	0	0	0
Mid-terms	1	4	4
Practice	14	1	14
Laboratory	0	0	0
Project	0	0	0
Final examination	1	4	4
Total Work Load			**128**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC316	Social Media				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC316	Social Media	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The purpose of this course is required for a media plan is to learn the steps and strategies.
Teaching Methods and Techniques:
In this course, it will be examine important of media planning, using media planning in PR and advertising, planning goals and methods.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Undefined Dekanlık

Recommended or Required Reading

Resources Arnold Barban, Steven M.Cristol, Frank J.Kopec, "", İstanbul: Epsilon Yay., 1995,Bilgen Başal, "", İstanbul: Çantay Yay., 1998,Mehmet Özkundakçı, "", İstanbul:Hayat Yay.

Course Category

Mathmatics and Basic Sciences	: 0	**Education**	: 0
Engineering	: 0	**Science**	: 0
Engineering Design	:	**Health**	: 0
Social Sciences	: 0	**Field**	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to media planning and Media term		
2	Media planning term, Media kinds, Advantages and disadvantages of media		
3	Main terms about media planning (Reach, frequency, GRPs, CPM, CPP)		
4	Marketing strategy and media planning		
5	Media planning in PR and Media planning in advertising		
6	Media buying and planning in mass media		
7	Buying and planning in digital media		
8	Midterm		
9	Buying and planning in local media.		
10	Buying and planning in social media.		
11	Media buying and planning in outdoor advertising.		
12	Media planning process		
13	Determination of marketing goals Determination of target market/audience.		
14	Determination of geographical region,Determination of timing		
15	Campaign period Continuous pattern Flight pattern Pulsing pattern		
16	Final		
17	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Distinguish medias in terms of PR and advertising effects.
C02	Recognize main terms of media planning.
C03	Describe tools and methods for using media planning.
C04	Evaluate a media planning of a firm.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	1	14
Hours for off-the-c.r.stud	12	1	12
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	16	16
Total Work Load			**50**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P10	P11	P12
C01	5	5	5	5	4	5	5	4	5	5	5
C02	5	5	5	5	4	5	5	4	5	5	5
C03	5	5	5	5	4	5	5	4	5	5	5
C04	5	5	5	5	4	5	5	4	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

SEC004	Social Elective Course				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	SEC004	Social Elective Course	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

ESC312	Standardization				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	ESC312	Standardization	2	2	2

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Propose of this course is to teach policies and international applications of standardization.
Teaching Methods and Techniques:
Standardization Policies, the standardization, International Standardization in trade in Turkey, the implementation of the mandatory Standards in Turkey
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Undefined Dekanlık
Assistants:

Recommended or Required Reading

Resources 1. Orhan Küçük, Standardizasyon ve Kalite, 2004
,

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	100	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Historical development and standardization		
2	Turkish standards institution (TSE) and standardization		
3	Quality concept and elements of the		
4	Total Quality Management		
5	Total quality control		
6	Quality assurance and quality assurance Systems		
7	Quality assurance and quality assurance Systems		
8	ISO 9000 Quality Assurance Systems		
9	ISO 9000 Quality Assurance Systems		
10	The concept of the week: Vocational Standards and Turkey Applications		
11	Instance Profession Standard		
12	The basics of quality manual		
13	Editing Documents and Liabilities		
14	Sample quality manual		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		
50	Historical development and standardization		
51	Final Exam		
52	Final Exam		
53	Midterm exam is given between 7th and 15th weeks.		
54	Sample quality manual		
55	Editing Documents and Liabilities		
56	The basics of quality manual		
57	Instance Profession Standard		
58	The concept of the week: Vocational Standards and Turkey Applications		
59	ISO 9000 Quality Assurance Systems		
60	ISO 9000 Quality Assurance Systems		
61	Quality assurance and quality assurance Systems		
225130	Turkish standards institution (TSE) and standardization		
225132	Quality concept and elements of the		
225134	Total Quality Management		
225136	Total quality control		
225138	Quality assurance and quality assurance Systems		

Course Learning Outcomes

No	Learning Outcomes
C01	Explain the importance and need of standardization.
C02	Explain Quality and Quality Concepts.
C03	Express the importance of Quality Assurance.
C04	Determine the International Standards.
C05	Explain the Occupational Standards.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.

P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	0	0	0
Assignments	1	12	12
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All					2	2			3	2	2
C01					2	2			3	2	2
C02					2	2			3	2	2
C03					2	2			3	2	2
C04					2	2			3	2	2
C05					2	2			3	2	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE356	System Dynamics and Control				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	MEE356	System Dynamics and Control	3	3	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To teach mathematical and dynamical models of engineering systems and their control.
Teaching Methods and Techniques:
Basic concepts, definitions, classification of control systems, the establishment of mathematical models and simulation of physical systems, transfer functions, frequency response, the control circuit stability, root locus method, transient and steady state response analysis of systems, the use of Matlab and Simulink, the block diagrams
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Asist Prof.Dr. Zafer ALBAYRAKInstructor Dr. Kenan IŞIKAsist Prof.Dr. Cihan MIZRAKAsist Prof.Dr. Aytül BOZKURT

Recommended or Required Reading

Resources • İbrahim Yüksel, Otomatik Kontrol / Sistem Dinamiği ve Denetim Sistemleri, Nobel Yayınları, Ankara, 2009
• Eronini I. Umez-Eronini, System Dynamics and Control,<

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	30	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to control systems		
2	Mathematical modeling of engineering systems		
3	Mathematical modeling of engineering systems (Homework 1 Delivery date: Week 5)		
4	Time response of systems		
5	Time response of systems (Homework 2 Delivery date: Week 7)		
6	Simulation and mathematical modeling of physical systems		
7	Simulation and mathematical modeling of physical systems		
8	Block diagrams (Homework 3 Delivery date: Week 10)		
9	Transfer functions		
10	Stability analysis (Homework 4 Delivery date: Week 12)		
11	Stability analysis		
12	Transient and steady response analysis of systems (Homework 5 Delivery date: Week 12)		
13	Using MATLAB and Simulink		
14	Using MATLAB and Simulink		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Define the structure of control systems.
C02	Explain the fundamental concepts,terminology and purpose of control sysyems.
C03	Compose mathematical models of various physical systems.
C04	Analyse the time domain transient and steady state response of zero, first and second order systems.
C05	Perform the simulation of mechatronic systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	2	24
Assignments	5	3	15
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	14	14
Total Work Load			**103**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	4	3	4	5	3	3	3	3	5	3	2	4
C02	4	3	4	5	3	3	3	3	5	3	2	4
C03	4	3	4	5	3	3	3	3	5	3	2	4
C04	4	3	4	5	3	3	3	3	5	3	2	4
C05	4	3	4	5	3	3	3	3	5	3	2	4

Karabük University

Faculty of Engineering
Mechanical Engineering

SEC003	Technical Elective Course				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
6	SEC003	Technical Elective Course	3	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	:	**Science**	:
Engineering Design	:	**Health**	:
Social Sciences	:	**Field**	:

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4058	Additive Manufacturing				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4058	Additive Manufacturing	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To have information about additive manufacturing methods, the usage area, purpose of this technology and the advantages it brings compared to conventional manufacturing technologies, providing information about the variety of materials used in software, equipment and methods and part design criteria, support design, material selection criteria, final processes It is aimed to give information about the manufacturing criteria.
Teaching Methods and Techniques:
Introduction to additive manufacturing (IR) technologies / Reverse engineering in additive manufacturing - (3D digitization, data generation, data capture, point cloud, filtering) / Software and STL files in additive manufacturing / Orientation and slicing strategies / Toolpath creation / Supports in IR and minimum volume support usage model, cost model / Photopolymerization (FP) technique based additive manufacturing methods, process parameters / Photopolymerization process (curing depth) model / FP laser scanning models (Weave, Aces etc.) and self-shrinkage model / FP technique based additive design criteria and finishing processes in manufacturing / Powder bed melting (TYE); Powder bed melting mechanisms depending on the materials and materials used / Solid state sintering- Partial melting- Full melting- Chemical bonding / SLS, SLM, EBM methods, parameters, energy model / Design criteria and finishing processes in TYE / Extrusion based (EB) additive production; parameters, materials, cartesian 3d printer, delta 3b printer, polar 3b printer, scara 3b printer / design criteria and finishing processes in EB additive manufacturing / Polyjet, Inkjet methods / Direct energy accumulation method, principles and basic principles, hybrid additive manufacturing methods
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. Selami Sağıroğlu
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Gibson, Ian, David W. Rosen, and Brent Stucker ," Additive Manufacturing Technologies Rapid Prototyping to Direct Digital Manufacturing. Springer, 2010. Andreas Gebha
Gibson, Ian, David W. Rosen, and Brent Stucker ," Additive Manufacturing Technologies Rapid Prototyping to Direct Digital Manufacturing. Springer, 2010.
Andreas Gebhardt, " Understanding Additive Manufacturing", Hanser Verlag, 2015
Srivatsan, T. S., and T. S. Sudarshan, "Additive Manufacturing: Innovations, Advances, and Applications". CRC Press, 2015.
Chee Kai Chua, Kah Fa, Leong, "3D Printing and Additive Manufacturing, World Scientific", 2014
Amit Bandyopadhyay, Susmita Bose, "Additive Manufacturing", 2015, CRC Press
Carneiro, O.S., Silva, A.F. ve Gomes, R., 2015, "Fused deposition modeling with polypropylene", Materials & Design, 83, 768– 776

Course Category

Mathmatics and Basic Sciences	:	25	**Education**	:	
Engineering	:	25	**Science**	:	25
Engineering Design	:	25	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to additive manufacturing, principles, classification and basic concepts		
2	Reverse engineering in additive manufacturing, (3D digitization, data generation, data capture, point cloud, filtering)		
3	Software in additive manufacturing, STL files, data development in STL and topological problems in STL		
4	Orientation and slicing strategies in additive manufacturing, step effect		
5	Toolpath creation, support development and minimum volume support usage model in additive manufacturing, cost model		
6	Additive manufacturing methods based on photopolymerization technique; material, process parameters		
7	Photopolymerization process (curing depth) model, scanning models (Weave, Aces etc.), self-shrinkage model		
8	Midterm Exam 1		
9	Powder bed melting methods; Powder bed melting mechanisms depending on the materials and materials used		
10	Powder bed melting; SLS, SLM, EBM, method-dependent parameters, energy model		
11	Extrusion based additive manufacturing method; parameters, materials, cartesian 3d printer, delta 3b printer, polar 3b prin		
12	Manufacturing methods, principles and basic principles with Inkjet and Binder jet		
13	Direct energy storage method, principles and fundamentals, Hybrid additive manufacturing methods		
14	Final		

Recommended Optional Programme Components

MEE327 Computer Aided Design

Course Learning Outcomes

No	Learning Outcomes
C01	To have knowledge about additive manufacturing technologies
C02	To gain the ability to choose the appropriate additive manufacturing method for the purpose
C03	To learn part and support design criteria in additive manufacturing methods
C04	Learning the effects of process parameters on part quality in additive manufacturing methods

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	15	4	60
Assignments	1	20	20
Presentation	1	20	20
Mid-terms	1	20	20
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**182**
ECTS Credit of the Course			**7**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	4	3	4	3	4	2	3	2	3	3
C01	5	4	4	3	4	3	4	3	3	2	3	2
C02	5	4	4	3	4	3	4	3	3	2	3	4
C03	5	4	4	3	4	3	4	4	3	2	3	4
C04	5	4	4	3	4	3	4	5	3	2	3	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4021	Advanced Strength				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4021	Advanced Strength	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
This course aims to provide automotive engineering students with the ability to analyze the strength of materials' problems simply and logically and to solve them using the basic principles of mechanics.
Teaching Methods and Techniques:
Introduction, Concept of stress, Stress and deformation under axial loading, Stress and deformation under torsion, Stress and deformation under pure bending, Analysis and design of beams for bending
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:
Dr. Özden İŞBİLİR
Assistants:

Recommended or Required Reading

Resources Mechanics of Materials, 9th Edition, R.C. Hibbeler, 2013, Pearson, ISBN:978-0133254426,Mechanics of Materials, 6th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., J
Cisimlerin Mukavemeti, 6. Basımdan Çeviri, Ferdinand P. Beer, E. Russell Johnston Jr., John T. Dewolf, David F. Mazurek, Çevirenler: Ayşe Soyuçok, Özgün Soyuçok, Litera

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:	40	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction and Concept of Stress- Introduction- A Review of the Methods of Statics- Stresses in the Members of a Structu		
2	Introduction and Concept of Stress- Application to the analysis and design of simplestructures- Stress on an oblique plane-		
3	Stress and Deformation Under Axial Loading- Normal strain under axial loading- Engineering stress-strain diagram- True st		
4	Stress and Deformation Under Axial Loading- Deformation under axial loading- Statically indeterminate cases- Thermal stre		
5	Stress and Deformation Under Axial Loading- Shear stress and deformation- Relation among the material properties- Stress		
6	Torsion- Stresses in a Shaft- Elastic deformation under torsion- Stress in the elastic range		
7	Torsion- Statically indeterminate shafts- Design of shafts- Stress concentrations in shafts		
8	Torsion- Plastic deformations under torsion- Elasto-plastic deformation under torsion- Residual Stresses under torsion		
9	Pure Bending- Deformations in a symmetric member under pure bending- Stresses and deformations in the elastic Range		
10	Pure Bending- Deformations in a transverse cross section- Bending of composite members- Stress concentrations		
11	Pure Bending- Plastic deformation- Elasto-plastic deformation- Residual stresses		
12	Pure Bending- Eccentric axial loading- Unsymmetric bending		
13	Analysis and Design of Beams forBending- Shear and bending moment diagrams- Relations among diagrams		
14	Analysis and Design of Beams forBending- Design of prismatic beams for bending- Nonprismatic beams		

Course Learning Outcomes

No	Learning Outcomes
C01	Explains the stress, types of stress and deformation.
C02	Calculates stresses, elasto-plastic stress and residual stresses under axial loading.
C03	Determines shear stresses and twist angles in shafts under torsion.
C04	Calculates normal stresses in beams exposed to simple bending.
C05	Draws the shear force and the bending moment diagrams along the beam depending on the loading and supports.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	5	%10
Assignment	5	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	2	24
Assignments	5	2	10
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**111**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P07
All	5	4	3	5	4
C01	5	4	3	5	4
C02	5	4	3	5	4
C03	5	4	3	5	4
C04	5	4	3	5	4
C05	5	4	3	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4044	Agricultural Machinery				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4044	Agricultural Machinery	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to teach the agricultural mechanization system, general features of agricultural equipment and machinery for agricultural production, agricultural tractors and energy resources in agriculture.
Teaching Methods and Techniques:
In this course, agricultural tools and machinery using in agricultural production will be explained as theoretical and applied.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Refik Polat
Assistants:

Recommended or Required Reading

Resources

1. Roth O. Lawrence ve H. L. Field. 1991. Introduction to Agricultural Engineering: A Problem Solving Approach. Van Nostrand Reeinhold, 115 Fifth Avenue, New York NY,
Advances in Agricultural Machinery and Technologies, Editor: Guangnan Chen
Agricultural Machinery & Mechanization, Editor: Segun R. Bello

Course Category

Mathmatics and Basic Sciences	:	15	**Education**	:	
Engineering	:	30	**Science**	:	10
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	15

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Mechanization in Agriculture and Agricultural Mechanization	-	-
2	The Physical, Chemical and Biological Properties of Soil	-	-
3	Soil Tillage Equipment and Machinery, Moldboard Plow and Disc Plow	-	-
4	Cultivators, Harrows, Subsoiler	-	-
5	Cultivators, Harrows, Subsoiler	-	-
6	Rototillers and Rollers	-	-
7	Sowing-Planting Machines, Mechanical Sowing Machines and Pneumatic Sowing Machines	-	-
8	Sowing Norm and Settings	-	-
9	Fertilizing Machinery	-	-
10	Agricultural War Machinery	-	-
11	Reaping-Harvest Machinery	-	-
12	Reaping-Harvest Machinery	-	-
13	Seed Cleaning and Classification Machinery	-	-
14	Agricultural Machinery Management	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Recognize agricultural machinery.
C02	Identify Turkey's General Characteristics of Agricultural, Agricultural Mechanization Status, Level of Mechanization of Turkey and Comparison with the world.
C03	Explain definitions and Concepts Related to Mechanization Management And Planning.
C04	Calculate mechanical performance, power performance, driver performance, capacity and values.
C05	Explain expense Forecasting Methods (Purchasing Costs, Fixed Costs, Operating Expenses, Indirect Expenses machine).
C06	Makes the choice of size and power for the tractor. Chooses the working width for agricultural machinery. Learns the rent or purchase decision criteria.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%20
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	1	14
Assignments	1	35	35
Presentation	0	0	0
Mid-terms	1	14	14
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	14	14
Total Work Load			**119**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	4	5	3	2	4	2	4	5	4	4	4
C01				5			2					
C02			4					4		4		
C03											4	
C04		5			4							4
C06						3						

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4031		Air Conditioning and Ventilation Systems Design			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4031	Air Conditioning and Ventilation Systems Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Teaching tp project Fundamentals and rules of air conditioning.
Teaching Methods and Techniques:
The introduction of ventilation and air conditioning systems, and the introduction of the machines belonging to this system, representing use and purpose as practical.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources	HVAC Systems Design Handbook, Roger W. Haines and Lewis Wilson 2003; Ventilation Systems: Design and Performance, Hazim B. Awbi 2007; Uygulamalı havalandırma
	HVAC Systems Design Handbook, Roger W. Haines and Lewis Wilson 2003; Ventilation Systems: Design and Performance, Hazim B. Awbi 2007; Uygulamalı havalandırma

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	40	**Science**	:	0
Engineering Design	:	40	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Principles of air conditioning systems, interior air quality, hygiene rules and climate redirect necessity.		
2	Thermal comfort and related concepts and relations Psychrometry		
3	Equations and diagrams related to air conditioning operation.		
4	All kinds of living space and industrial facilities (residential, hotels, factories, etc..) Indoor air conditions.		
5	Heat gain and loss calculation.		
6	Heat gain and loss calculation.		
7	Heat gain and loss calculation.		
8	Midtherm		
9	Air duct system sizing.		
10	Air duct system sizing.		
11	Ventilation openings, culverts, etc. difüzörlerle. election and related calculations.		
12	The noise level and air conditioning systems to prevent roads		
13	Design of air conditioning and ventilation plant		
14	Cost analysis of the prepared the project.		
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Learning about the basic definitions of air conditioning.
C02	Learn equipment selection and design of air conditioning system.
C03	Types of ventilation systems and to learn.
C04	Ventilation can be prepared project.
C05	Cooling system design is learned.
C06	Can draw of air conditioning project.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**116**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	3	5	4	3	3	4	5	5	4	5	4

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4020	Applications of Finite Element Analysis				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4020	Applications of Finite Element Analysis	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach the modeling of complex systems with the simulation method and to examine them with the help of models.
Teaching Methods and Techniques:
Introduction to simulation and classification of simulation model types, stochastic, discrete simulation, Monte Carlo simulation and applications, variance reduction techniques, equal and opposite random numbers, control variable, indirect measurement, importance sampling. Output analysis, terminated models, non-terminated models, comparison of systems, response surface, optimization. System dynamics, agent based simulation, agent environment interaction, state charts, hybrid simulation models.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Mehmet Erdi Korkmaz
Assistants:

Recommended or Required Reading

Resources
None,
North, M.J., 2007. Managing Business Complexity: Discovering Strategic Solutions With Agent Based Modeling and Simulation, Oxford University Press.

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:	60	**Health**	:	0
Social Sciences	:	0	**Field**	:	20

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to simulation and classification of simulation model types		
2	Stochastic, discrete simulation, Monte Carlo simulation and applications		
3	Variance reduction techniques, equal and opposite random numbers		
4	Control variable		
5	Output analysis, finite models		
6	Infinite models		
7	Comparison of systems		
8	Response surface methodology		
9	System dynamics		
10	Agent based simulation		
11	Agent environment interaction		
12	State charts		
13	Hybrid simulation models		
14	Indirect measurement, importance sampling		

Course Learning Outcomes

No	Learning Outcomes
C01	Ability to build simulation models of complex systems
C02	Ability to build agent-based simulation models
C03	Ability to build hybrid simulation models
C04	Ability to use variance reduction techniques in simulation models
C05	Ability to use advanced techniques in the analysis of simulation outputs

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	9	126
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	14	14
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**202**
ECTS Credit of the Course			**8**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P04	P05
C01	5	5	5
C02	5	5	5
C03	5	5	5
C04	5	5	5
C05	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4023	Biofluid Dynamics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4023	Biofluid Dynamics	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
This course elaborates on the application of fluid mechanics principles to major human organ systems. The course is an introduction to physiologically relevant fluid flow phenomena, underlying physical mechanisms from an engineering perspective. The focus of the course is on the integration of various fluid mechanics concepts to address relevant problems of the human body's systems.
Teaching Methods and Techniques:
Biorheology, Circulatory biofluid mechanics, Synovial fluid in joints, Biofluid dynamics of the human brain, Respiratory biofluid mechanics, Flow and pressure measurement techniques in human body
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	C. Kleinstreuer, Biofluid Dynamics: Principles and Applications, CRC Press, Taylor&Francis Group, 2006. ,Aksel, M. H. and Eralp, O. C, Gas Dynamics, Prentice Hall, Inc., E

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Review of basic fluid mechanics		
2	Review of basic fluid mechanics		
3	Biorheology		
4	Biorheology		
5	Circulatory biofluid mechanics		
6	Circulatory biofluid mechanics		
7	Synovial fluid in joints		
8	Synovial fluid in joints		
9	Biofluid dynamics of the human brain		
10	Biofluid dynamics of the human brain		
11	Respiratory biofluid mechanics		
12	Respiratory biofluid mechanics		
13	Flow and pressure measurement techniques in human body		
14	Flow and pressure measurement techniques in human body		

Course Learning Outcomes

No	Learning Outcomes
C01	Understand the physiology and anatomy of studied systems.
C02	Analyze fluid mechanics models currently used for clinical research problems.
C03	Integrate fluid dynamics engineering concepts to examine and to model the biological flow in human body.
C04	Identify specific diseases and how they are related to fluid dynamics.
C05	Have the capability to carry out a biofluid dynamics design project.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%5
Project	1	%5
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	7	2	14
Laboratory	0	0	0
Project	1	3	3
Final examination	1	5	5
Total Work Load			**117**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	5	3	1	2	1	5	1	4	3	1	4
C01	4	5	3	1	2	1	5	1	4	3	1	4
C02	4	5	3	1	2	1	5	1	4	3	1	4
C03	4	5	3	1	2	1	5	1	4	3	1	4
C04	4	5	3	1	2	1	5	1	4	3	1	4
C05	4	5	3	1	2	1	5	1	4	3	1	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4019	Composite Materials and Manufacturing Methods				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4019	Composite Materials and Manufacturing Methods	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Objectives of this course are: having the student's ability to understand the engineering materials and their properties and using these concepts in engineering application.
Teaching Methods and Techniques:
Introduction to Composites Composites Matrices and Properties (Polymers, Metal and Ceramics) Reinforced Materials ; Fibers (glass and carbon) and Whiskers and Particulates Manufacturing of Polymers/Metal Matrices Composites Interface between matrices and reinforcements.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:
Dr. Gökhan SUR
Assistants:

Recommended or Required Reading

Resources Advanced Composites Manufacturing, Timothy G. Gutowski (Ed),Composite Manufacturing Technology, Bratukhin, A.G. and Bogolyubov V.S.,Composites Manufacturing: M
Composite Materials and Manufacturing Methods course notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	40	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definition and importance of composite		
2	Types of composites		
3	Metal amtrix composites		
4	Aluminium matrix compsoites		
5	Manufacturing of metal matrix composites		
6	Ceramic matrix composites		
7	Manufacturing of ceramic matrix composites		
8	plastic matrix materials and their composites		
9	Midterm examination		
10	Thermosets and thermoplastic composites		
11	Reinforcement materials, Fibres		
12	Manufacturing of polymer matrix composites		
13	Determination of design parameters and production method for production		
14	Composite materials technology		
15	Recent developments in composite materials		
16	Final examination		
17	Resit examiation		

Course Learning Outcomes

No	Learning Outcomes
C01	Define Composite Materials and classify Engineering Materials according to their structures
C02	Know the reinforcement materials and their properties and understand the role of reinforcement material
C03	Know the reinforcement materials and their properties and understand the role of reinforcement material
C04	Know the importance of the interface and learn the interface bonds
C05	Comprehend the composite production methods and their advantages and disadvantages
C06	Understand the importance of lightness, shaping (plastic) and strength for engineering materials and the development of these properties

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	3	39
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	25	25
Total Work Load			**121**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	2	4	3	2	2	3	2	2	2	2	2
C01	4	2	4	3	2	2	3	2	2	2	2	2
C02	4	2	4	3	2	2	3	2	2	2	2	2
C03	4	2	4	3	2	2	3	2	2	2	2	2
C04	4	2	4	3	2	2	3	2	2	2	2	2
C05	4	2	4	3	2	2	3	2	2	2	2	2
C06	4	2	4	3	2	2	3	2	2	2	2	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4034	Computational Fluid Dynamics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4034	Computational Fluid Dynamics	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The course covers introductory aspects of Computational Fluid Dynamics (CFD) with focus on flow and heat transfer problems. It will be learned to the latest advancements in discretization methods for engineering problems. The programming languages and commercial softwares will be used.
Teaching Methods and Techniques:
Fundamental concepts, Governing equations, Turbulence modeling, Finite volume discretization of steady and unsteady diffusion and advection processes, Techniques for the solution of compressible and incompressible flows.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Essentials of Computational Fluid Dynamics, by Mueller,Essential Computational Fluid Dynamics, by Zikanov,Computational Fluid Mechanics and Heat Transfer, by Pletcher

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definitions and fundamental principles		
2	Conservation laws of fluid motion and boundary conditions		
3	Turbulence and its modelling		
4	Turbulence and its modelling		
5	The finite volume method for diffusion problems		
6	The finite volume method for convection-diffusion problems		
7	The finite volume method for convection-diffusion problems		
8	Solution algorithms for pressure-velocity couplingin steady flows		
9	Solution of discretized equations		
10	Solution of discretized equations		
11	The finite volume method for unsteady flows		
12	The finite volume method for unsteady flows		
13	Implementation of boundary conditions		
14	Errors and uncertainty in CFD modelling		

Course Learning Outcomes

No	Learning Outcomes
C01	Gains knowledge of fundamental concepts of CFD.
C02	Gains knowledge of governing equations of flow and heat transfer problems.
C03	Gains knowledge of turbulence modeling.
C04	Gains knowledge of finite volume discretization of steady and unsteady processes.
C06	Gains knowledge about solution of compressible and incompressible flows.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%5
Project	1	%5
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	7	2	14
Laboratory	0	0	0
Project	1	3	3
Final examination	1	5	5
Total Work Load			**117**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	5	3	1	2	1	5	1	4	3	1	4
C01	4	5	3	1	2	1	5	1	4	3	1	4
C02	4	5	3	1	2	1	5	1	4	3	1	4
C03	4	5	3	1	2	1	5	1	4	3	1	4
C04	4	5	3	1	2	1	5	1	4	3	1	4
C06	4	5	3	1	2	1	5	1	4	3	1	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4011		Computer Aided Manufacturing			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4011	Computer Aided Manufacturing	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To identify the Computer Aided Manufacturing processes. To understand the manufacturing processes using in formation of product. To recognize the application and potential benefits of the automation and CAM concepts. To inform about the manufacturing processes supported from computer-based systems, tools and systems using in industry. To list the elements in Computer Aided Manufacturing medium. To explain the different automation techniques using in industry.
Teaching Methods and Techniques:
Computer-Aided Manufacturing (CAM) and components. Flexible manufacturing systems (ECS) and examples. The structure of the computer-controlled manufacturing systems. Design process steps in the CAD / CAM systems and the structure of the CAD system. Standard data base used in CAD/CAM systems and data exchange between systems in the Standard data base. CAD/CAM data transfer and data flow. Design techniques using in CAD/CAM systems, the transition phase from design to manufacturing. Computer Aided Process Planning (CAPP) in CAM, approaches using in process planning, data flow in CAPP. Group technology, the role of group technology in CAD/CAM integration, work-time distribution during part fabrication, group in the part production.
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. Selami Sağıroğlu
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources mastercam,solidcam
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Course Category

Mathmatics and Basic Sciences	: 25		**Education**	:	
Engineering	: 25		**Science**	: 25	
Engineering Design	: 25		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	To learn the integrated ways of mechanical, electronic and information technology for manufacturing.		
2	To obtain information about the hierarchical and distributed computer control supported software and hardware.		
3	To obtain information about data collection, monitoring, processing and spreading.		
4	To obtain about sensors, tool control and station control. To learn the factory local area networks and their protocols.		
5	To learn the functioning of Computer Aided Design/Manufacturing (CAD/CAM) in manufacturing medium.		

Course Learning Outcomes

No	Learning Outcomes
C01	Computer-Aided Manufacturing (CAM) and Components
C02	Flexible Manufacturing Systems (ECS) and Examples. The Structure of The Computer-Controlled in Manufacturing Systems
C03	Design Process Steps in the CAD / CAM Systems and the Structure of The CAD System
C04	Standard Data Base Used in CAD/CAM Systems and Data Exchange between Systems in the Standard Data Base.
C05	Standard Data Base Used in CAD/CAM Systems and Data Exchange between Systems in the Standard Data Base.
C06	Definition of start point. Creating a stock. Setting the stock. Chosing a tool. Adding a new tool.
C07	Group technology, the role of group technology in CAD/CAM integration, work-time distribution during part fabrication, group in the part production.
C08	BSD code preparation methods, properties of CAD/CAM programs. DNC systems and structure. CAD/CAM integration.
C09	Product Design Techniques. 3 Dimensional Machinery, Product Modeling Techniques on the computer.
C10	Required operations for surface processing. BSD codes generate methods and BSD machine code sending.
C11	To plan the computer aided process with modeling of parts in CAD medium
C12	CAM Strategy Development
C13	CAM Strategy Development
C14	CAM Strategy Development

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	1	14	14
Assignments	10	4	40
Presentation	0	0	0
Mid-terms	15	1	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	18	3	54
Total Work Load			**151**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	5	4	4	3	3	2	2	3	3	4
C01	5	5	5	4	4	3	3	2	2	3	3	4
C02	5	5	5	4	4	3	3	2	2	3	3	4
C03	5	5	5	4	4	3	3	2	2	3	4	4
C04	5	5	5	4	4	3	3	2	2	3	3	4
C05	5	5	5	4	4	3	3	2	2	3	3	4
C06	5	5	5	4	4	3	3	2	2	3	3	4
C07	5	5	5	4	4	3	3	2	2	3	4	4
C08	5	5	5	4	4	3	3	2	2	3	3	4
C09	5	5	5	4	4	3	3	2	2	3	3	4
C10	5	5	5	4	4	3	3	2	2	3	3	4
C11	5	5	5	4	4	3	3	2	2	3	3	4
C12	5	5	5	4	4	3	3	2	2	3	3	4
C13	5	5	5	4	4	3	3	2	2	3	3	4
C14	5	5	5	4	4	3	3	2	2	3	3	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4052	Digital Control System Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4052	Digital Control System Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Understanding of Modeling of Digital Control Systems, Signal sampling and Shannon Theorem. Understanding the behavior properties of poles in the Z plane, frequency response and geometric location of roots. Learning the stability analysis of digital control systems and PID and RST type control methods.
Teaching Methods and Techniques:
Repetition of continuous time control systems. Introduction to digital control systems. Signal sampling and Shannon theorem. The z transform. Difference equations. Discrete state equations. Discrete time transfer function. Stability of discrete time systems. Nyquist criteria. PID controller design in the Z plane. RST controller design.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Fatih PEHLİVAN
Assistants:

Recommended or Required Reading

Resources 2. Ioan D. Landau, Gianluca Zito, Digital Control Systems, (Springer, 2006 ISBN:1846280559),1. M. Kemal Sarıoğlu, Yücel Aydın, Digital Control Systems, (Birsen Yayınevi

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	50	**Science**	:	
Engineering Design	:	50	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Continuous-time control systems		
2	Structures and principles of digital control systems		
3	Components of digital control systems		
4	Signal sampling and Shannon's theorem		
5	Z transform		
6	Discrete-time state equations		
7	Discrete-time state equations		
8	MIDTERM EXAM		
9	Discrete-time transfer function		
10	Discrete-time transfer function		
11	Stability of linear discrete-time systems		
12	Controller design in the complex plane		
13	Zero-pole simplification, Feed-forward		
14	Zero-pole simplification, Feed-forward		
15	Parallel and cascade structures		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will recognize the basic features of digital control systems
C02	Students will gain the ability to transfer dynamic system models in continuous time to discrete time.
C03	Students will conduct stability analysis with frequency response
C04	Ability to design PID and RST controllers in the complex plane

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	13	13
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**126**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	5	5	5	5	3	3	1	4	4	5	4	4
C02	5	5	5	5	3	3	1	4	4	5	4	4
C03	5	5	5	5	3	3	1	4	4	5	4	4
C04	5	5	5	5	3	3	1	4	4	5	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4002	Electric and Hybrid Vehicles				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4002	Electric and Hybrid Vehicles	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to give basic information about electronic elements and to teach students the structures, working principles and applications of these elements.
Teaching Methods and Techniques:
Electrical Units, series and parallel circuits, avometers and oscilloscope, resistors, capacitors and coils, diode, NPN and PNP type transistors, thyristor and triac, integrated circuits, operational amplifiers, timer integrated circuits.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. M. Bahattin Çelik
Assistants:

Recommended or Required Reading

Resources Automobile electrical and electoric systems Tom Denton Hodder Headline Group,1995.,Basic Electronics, A. Çolpan H. Vural N. Bölük Ankara 1997.
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Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Electrical Units, Ohm law, Power, etc.	-	-
2	Series, parallel and mixed circuits	-	-
3	Avometres	-	-
4	Oscilloscope	-	-
5	Resistors	-	-
6	Capacitors and coils	-	-
7	RLC series circuits	-	-
8	Diodes	-	-
9	NPN and PNP type transistors	-	-
10	Studying of various circuits with transistors	-	-
11	Thyristor triac and diac	-	-
12	Operational amplifiers	-	-
13	Timer integrated circuits	-	-
14	Studing on various circuist	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Students make measurements in vehicles using basic electrical electronics knowledge and measuring instruments.
C02	Recognise the electrical and electronic systems in motor vehicles.
C03	Analysis the electric and electronic circuits.
C04	Perform electronic circuit applications.
C05	Diagnose the electric and electronic problems in the field of automotive engineering by using electrical and electronic knowledge.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	1	%20
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	1	10	10
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**98**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P11	P12
C01	2		3		4	1	1	3	4
C02		3		2	1	4	3	2	1
C03	3		1	2		5	1		3
C04	2	3	1	4	1	2	2	3	4
C05		2	1	2	2		1	4	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4059	Elevators and Escalators				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4059	Elevators and Escalators	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of the course is to give students the ability to make calculations in elevator and escalator design.
Teaching Methods and Techniques:
Electric elevator systems, Elevator parts, TS 4190-1 / 2 standards, Lift application project: Calculations, Lift application project: Project preparation, TSE EN 81-1 standard, Escalators
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Fatih PEHLİVAN
Assistants:

Recommended or Required Reading

Resources	Asansörler ve Yürüyen Merdivenler,E.İmrak

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Elevator systems		
2	Elevator Parts		
3	Elevator Parts		
4	TS 4190-1 / 2 standards		
6	TS 4190-1 / 2 standards		
7	Elevator application project: Project Preparation		
8	Midterm Exam		
9	Elevator application project: Calculations		
10	Elevator application project: Calculations		
11	Escalators		
12	Constructions of escalators and bands		
13	Constructions of escalators and bands		
14	Projecting principles of elevators and escalators		
15	Projecting principles of elevators and escalators		
16	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	They will be able to determine the basic requirements for elevator systems
C02	They will be able to determine the appropriate elevator design for the requirements
C03	They will be able to create the elevator application project
C04	They will be able to determine the appropriate escalator design for the requirements
C05	They will be able to determine escalator project requirements

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	10	120
Assignments	1	10	10
Presentation	0	0	0
Mid-terms	1	16	16
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	24	24
Total Work Load			**212**
ECTS Credit of the Course			**7**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	3	4	4	5	3	2	4	4	5	2	4
C01	2	3	3	3	5	3	2	4	4	5	2	4
C02	3	3	4	3	5	2	2	4	4	5	2	4
C03	4	3	4	4	5	3	2	4	4	5	2	4
C04	3	3	4	4	5	3	2	4	4	5	2	4
C05	4	3	3	4	5	3	2	4	4	5	2	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4008	Gas Dynamics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4008	Gas Dynamics	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Providing detailed theoretical and practical information about gas dynamics
Teaching Methods and Techniques:
One-dimensional compressible flows including basic concepts; isentropic flow; normal and oblique shock waves; flows with heat transfer (Rayleigh line), friction (Fanno line), simple waves, steady flows, steady flow and one-dimensional, unsteady flow
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Aksel, M. H. and Eralp, O. C, Gas Dynamics, Prentice Hall, Inc., Englewood Cliffs, New Jersey, 1994., Robert D. Zucker, Oscar Biblarz, Fundamentals of Gas Dynamics, 3rd

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definitions and Fundamental Principles		
2	Definitions and Fundamental Principles		
3	Control Volume Analysis		
4	Control Volume Analysis		
5	Introduction to Compressible Flow		
6	Introduction to Compressible Flow		
7	Varying-Area Adiabatic Flow		
8	Varying-Area Adiabatic Flow		
9	Normal Shocks		
10	Normal Shocks		
11	Moving and Oblique Shocks		
12	Prandtl–Meyer Flow		
13	Fanno Flow		
14	Rayleigh Flow		

Course Learning Outcomes

No	Learning Outcomes
C01	Gains knowledge of control volume analysis.
C02	Gains knowledge of compressible flow.
C03	Gains knowledge of adiabatic flow.
C04	Gains knowledge of normal shock waves.
C06	Gains knowledge about Prandtl-Meyer, Fanno and Rayleigh flows.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%5
Project	1	%5
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	7	2	14
Laboratory	0	0	0
Project	1	3	3
Final examination	1	5	5
Total Work Load			**117**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	5	3	1	2	1	5	1	4	3	1	4
C01	4	5	3	1	2	1	5	1	4	3	1	4
C02	4	5	3	1	2	1	5	1	4	3	1	4
C03	4	5	3	1	2	1	5	1	4	3	1	4
C04	4	5	3	1	2	1	5	1	4	3	1	4
C06	4	5	3	1	2	1	5	1	4	3	1	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4004	Heat Exchangers				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4004	Heat Exchangers	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To inform about the definition, importance, usage purpose and place of heat exchangers, to inform them about their classification, to have knowledge about heat analysis methods of heat exchangers, to design and calculate various heat exchangers, to have information about design parameters, to make economic analysis, to have knowledge about simulations of heat exchangers.
Teaching Methods and Techniques:
Introduction to heat exchangers, Constructions of heat exchangers, Flow arrangements in heat exchangers, Heat calculations of heat exchangers, Logarithmic Average Temperature Difference method, Effectiveness-NTU method, Cross flow on pipe bundle, Economic analysis of heat exchangers, Pressure drop in heat exchangers, Simulation of heat exchangers.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Erhan Kayabaşı
Assistants:

Recommended or Required Reading

Resources

Isı değiştiricileri, Prof.Dr. Osman F. Genceli ,Heat Exchangers, selection,rating, and thermal design, Sadık Kakaç, Hongtan Liu,Fundamentals of Heat Exchanger Design, Ra
1. Isı değiştiricileri, Prof.Dr. Osman F. Genceli
2. Heat Exchangers, selection, rating, and thermal design, Sadık Kakaç, Hongtan Liu
3. Fundamentals of Heat Exchanger Design, Ramesh K. Shah and Dusan P. Sekulic

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	: 70	**Science**	:
Engineering Design	: 30	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to heat Exchangers		
2	Introduction to heat Exchangers		
3	Heat calculations of parallel flow heat exchangers		
4	Heat calculations of counter flow heat exchangers		
5	Cross flow over bank of tube		
6	Cross flow over bank of tube		
7	Ecomonic analysis of heat exchangers		
8	Economic analysis of heat exchangers		
9	Pressure drop in heat exchangers		
10	Pressure drop in heat exchangers		
11	Economic analysis in case of pressure drop in heat exchangers		
12	Economic analysis in case of pressure drop in heat exchangers		
13	Simulation of heat exchangers		
14	Simulation of heat exchangers		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to analyze different types of heat exchangers and the material properties used in their construction.
C02	Students will be able to calculate heat transfer parameters related to heat exchangers of different types and geometries.
C03	Students will gain the ability to perform heat analysis of heat exchangers.
C04	Students will be able to make economic analysis of heat exchangers.
C05	Students will gain the ability to simulate heat exchangers.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%50
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	2	10	20
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**124**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	5	1	2	1	1	5	3	5	1	5
C01	5											
C02		5										
C03												5
C04											5	
C05					5							

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4009	Hydraulic Machinery				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4009	Hydraulic Machinery	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Introduction to hydraulic machine theory, turbine and pump design principles and use in engineering applications
Teaching Methods and Techniques:
Classification of hydraulic machinery; Theory of turbomachinery; Euler`s theorem; Velocity diagram; Francis turbine; head, specific speed, power, efficiency, and definitions; Dimensional analysis and similarity; Hill curves; Cavitations; Design of Francis, Kaplan, Pelton and Banki turbines; Centrifual pumps; head-flow rate, specific speed, power, efficiency and cavitations definitions; Operating point for different pump systems; Design of centrifugal pump; Axial pumps, Volumetric pumps.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Mehmet BAKIRCI
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources 1. Özgür, C. 1983. Su Makinaları Dersleri, İTÜ, Sayı:1260, 345 s., İstanbul. 2. Başeşme, H. 2003. Hidroelektrik Santrallar ve Hidroelektrik Santral Tesisleri, EÜAŞ Hidrolik S

1. Özgür, C. 1983. Su Makinaları Dersleri, İTÜ, Sayı:1260, 345 s., İstanbul. 2. Başeşme, H. 2003. Hidroelektrik Santrallar ve Hidroelektrik Santral Tesisleri, EÜAŞ Hidrolik S

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	20	**Science**	:	10
Engineering Design	:	20	**Health**	:	0
Social Sciences	:	0	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction: Hydraulic machines, their usage, classification. Scope of hydraulic machines: turbine and pump examples. Be		
2	Fundamental Concepts Of Turbomachines: Theory of turbomachines. Energy transfer between fluid and rotor. Euler theory		
3	Hydraulic Turbines: Classification. Layout of a hydro-electrical power plant. Francis turbines. Diffuser. Definition of turbine		
4	Basic Equations For Turbines: Definition of fundamental terms and derivation of governing equations for turbines: head, sp		
5	Dimensional Analysis & Similarity Theory: Dimensional analysis. Similarity theory. Similarity rules: geometrical, kinematical		
6	Cavitation: Definition of cavitation. Analysis of effective parameters on cavitation. Developing cavitation criteria. Effect of c		
7	Francis Turbines: Definition of design parameters. Derivation of design tools. Calculation of turbine main c		
8	Midterm		
9	Kaplan Turbines: Introduction to Kaplan turbines. Definition of design parameters and methodology. Formulation of main c		
10	Pelton Turbines: Introduction to Pelton turbines. Derivation of formula for velocity polygon and power calculation. Definitio		
11	Banki & Bulb Turbines: Introduction to Banki and Bulb turbines and their applications for low head and small scale hydroele		
12	Centrifugal Pumps: Principles of centrifugal pump operation. Derivation of fundamental equations: manometrical head-flow		
13	Analysis of Pumping Systems: Finding operating point for different pump systems; single, parallel, serial pumps; pipe chara		
14	Analysis Of Centrifugal Pumps: Definition of design parameters, pump and blade designs		
15	Axial Pumps: Introduction to axial pumps and their usage; Volumetric Pumps: Introduction to volumetrical pumps and their		
16	final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Defines the principles of hydraulic machines
C02	Calculates and designs turbine and pump

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	3	14	42
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	45	45
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	45	45
Total Work Load			**132**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	4	3	3	4	4	3	2	3	3	3	3	5
C02	4	3	3	4	4	3	2	3	3	3	3	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE459	Industrial Practice II				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE459	Industrial Practice II	0	0	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To strengthen the theoretical knowledge of students and ensure their application, to create opportunities for them to decide on their career goals and to direct them to create a professional foundation.
Teaching Methods and Techniques:
* Continuing mechanical and / or automotive engineering applications. * Vocational Education * Practical Applications * Professional Ethics practices * Environmental Health Practices
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Samet Uslu
Assistants:

Recommended or Required Reading

Resources	Staj yapılan işletmede kullanılan kaynaklar.

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	100	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Mesleki Deneyim ve Uygulamalar		
2	Mesleki Deneyim ve Uygulamalar		
3	Mesleki Deneyim ve Uygulamalar		
4	Mesleki Deneyim ve Uygulamalar		

Course Learning Outcomes

No	Learning Outcomes
C01	Makina ve Otomotiv Mühendisliği ile ilgili ulusal ve uluslararası gelişmeleri açıklar ve raporlar.
C02	İş yaşamı, hukuku, sorumlulukları ve şirket-çalışan ilişkilerini tanır.
C03	Mesleki deneyim kazanır.
C04	Mühendislikte ekonomi, pazarlama ve proje değerlendirme kurallarını kullanır.
C05	İş hayatında meslek ahlakı ve çevre sağlığı kurallarını uygular.
C06	Makina ve Otomotiv Mühendisliği Anlanlarında Modern Teknik ve Metotları kullanır.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	1	%100
Project	0	%0
Final examination	0	%0
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	6	20	120
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**120**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	5	5	5	5	5	5	5	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE409	Industrial Traning				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE409	Industrial Traning	5	5	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
It is for students to be trained as engineers who know how to apply and become effective and privileged in the market.
Teaching Methods and Techniques:
It is for students to be trained as engineers who know how to apply and become effective and privileged in the market.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. Selami Sağıroğlu
Assistants:

Recommended or Required Reading

Resources Documents of the applied enterprise

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	50	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	50

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Workplace Training		
2	İş Yeri Eğitimi		
3	İş Yeri Eğitimi		
4	İş Yeri Eğitimi		
5	İş Yeri Eğitimi		
6	İş Yeri Eğitimi		
7	İş Yeri Eğitimi		
8	İş Yeri Eğitimi		
9	İş Yeri Eğitimi		
10	İş Yeri Eğitimi		
11	İş Yeri Eğitimi		
12	İş Yeri Eğitimi		
13	İş Yeri Eğitimi		
14	Workplace Training		

Course Learning Outcomes

No	Learning Outcomes
C01	Many important values such as business ethics, problem solving ability and experience that are not provided in formal education conditions will be gained to students.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%100
Project	0	%0
Final examination	0	%0
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	5	70
Hours for off-the-c.r.stud	5	4	20
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	10	10
Practice	4	4	16
Laboratory	0	0	0
Project	0	0	0
Final examination	2	10	20
Total Work Load			**136**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	5	4	5	4	4	5	4	5	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4016		Internal Combustion Engines			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4016	Internal Combustion Engines	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to teach basic information about the structure, operation and cycles of internal combustion engines.
Teaching Methods and Techniques:
Working principles of engines. Thermodynamic cycles of internal combustion engines, engine performance parameters, friction force in the cylinder and lubrication system, combustion in engines, alternative fuels, mixture formation. Emissions in engines. Engine tests, engine characteristics, new technologies. Thermal losses in engines.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Associate Prof.Dr. Mehmet ÇELİK
Assistants:

Recommended or Required Reading

Resources
Internal Combustion Engines Nobel Publications
Internal Combustion Engines Birsen Publications

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	
Engineering	:	20	**Science**	:	10
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	40

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Working principles of engines		
2	Working principles of engines		
3	Thermodynamic cycles of internal combustion engines.		
4	Thermodynamic cycles of internal combustion engines.		
5	Engine performance parameters		
6	Combustion in engines.		
7	Combustion in engines.		
8	Mid-terms		
9	Alternative fuels.		
10	Alternative fuels.		
11	Mixture formation		
12	Emissions in engines.		
13	Engine tests, engine characteristics, new technologies.		
14	Thermal losses in engines.		
15	Final Exam		

Recommended Optional Programme Components

MEE4030 Vehicle Technologies

Course Learning Outcomes

No	Learning Outcomes
C01	Learns the working principles of engines.
C02	Learns the thermodynamic cycles of internal combustion engines.
C03	Learns engine performance parameters.
C04	Learns the friction force and lubrication system in the cylinder.
C05	Learns the burning phenomenon in engines.
C06	Learns alternative fuels and mixture formation.
C07	Learns the emissions and causes of engines.
C08	Learns engine tests, engine characteristics and new technologies.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	1	10	10
Hours for off-the-c.r.stud	1	10	10
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	45	45
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	55	55
Total Work Load			**120**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All											2	
C01	4		3		4	4			3			
C03	3		3									
C04		3			4	4			3			
C05												3
C06							2			4		
C07		4						4				
C08				4	4	4						4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4035	Introduction to Bioengineering				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4035	Introduction to Bioengineering	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Description of bioengineering concept and provide the students with the working fields comprised by bioengineering, in general.
Teaching Methods and Techniques:
Definition of Bioengineering study areas, other disciplines that constitute Bioengineering, discussion about the subjects that bioengineering interest of. Current state of Bioengineering and its future status, deliberating on how approaches of engineering and biology are combined in order to solve problems of science and technology. Ethics and latest advances in bioengineering.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Introduction to bioengineering, S.A.Berger, W.Goldsmith E.R.Lewis Introduction to Bioengineering course notes

Course Category

Mathmatics and Basic Sciences	:	25	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:	20	**Health**	:	25
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definition of Bioengineering, current state and its future		
2	Structure of Bioengineering		
3	Combining approaches of engineering and biology in order to solve problems of science and technology		
4	Other disciplines constituting Bioengineering.		
5	Other disciplines constituting Bioengineering.		
6	Fields that Bioengineering comprise of		
7	Preparation techniques for oral and written presentations.		
8	Bioengineering and applications in life sciences.		
9	Midterm examination		
10	Bioengineering and Biotechnology.		
11	Bioengineering and Medicine		
12	Bioengineering and Nanotechnology		
13	Overall view to biomedical devices		
14	Bioengineering and ethics		
15	Latest advances in Bioengineering.		
16	Final Examination		
17	Resit Examination		

Course Learning Outcomes

No	Learning Outcomes
C01	Student will get the preliminary knowledge about this multidisciplinary science at the inception of his/her study in Bioengineering department.
C02	Students will gain the ability of combining approaches of engineering and biology in order to solve problems of science and technology
C03	The students will have the fundamentals about bioengineering and applications in life sciences
C04	The students will have knowledge in detail about all of the engineering sciences and other sciences composing bioengineering.
C05	The students will gain perception of science and have knowledge about the latest advances in bioengineering

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	3	39
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	25	25
Total Work Load			**121**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	2	2	3	2	2	3	3	3	1	3	2
C01	3	2	2	3	2	2	3	3	3	1	3	2
C02	3	2	2	3	2	2	3	3	3	1	3	2
C03	3	2	2	3	2	2	3	3	3	1	3	2
C04	3	2	2	3	2	2	3	3	3	1	3	2
C05	3	2	2	3	2	2	3	3	3	1	3	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4043	Introduction to Biomechanics				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4043	Introduction to Biomechanics	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The purpose of this course is to introduce students to concepts of mechanics as they apply to human body and movement, particularly those pertaining to exercise, sport, and physical activity. The student should gain an understanding of the mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective.
Teaching Methods and Techniques:
Basic Statics and Joint Mechanics, Musculoskeletal Anatomy, Basic Dynamics to Human Motion, Structure, Function, and Adaptation of Major Tissues and Organs, Fundamental Strength of Materials in Biological Tissues, Introduction to Viscoelasticity, Biofiluids
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Biomechanics: Motion, Flow, Stress and Growth, Y.C. Fung, Springer-Verlag, 1990,Biomechanics, Concepts and Computation, C. Oomens, M. Brekelmans, F. Baaijens, Car Introduction to Biomechanics course notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	30	**Science**	:	
Engineering Design	:	30	**Health**	:	20
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction, general introduction to biomechanics		
2	Introduction to biomechanics: Terms, axes, planes, biological structures, internal and external prostheses		
3	Introduction to biomechanics: Terms, axes, planes, biological structures, internal and external prostheses		
4	Anatomical information: Parts of the body, bone, muscle and circulatory systems		
5	Anatomical information: Parts of the body, bone, muscle and circulatory systems		
6	Elasticity: Strain, strain, equilibrium equations		
7	Elasticity: Hook's law and applications		
8	Viscoelasticity: Relaxation and creep		
9	Midterm examination		
10	Viscoelasticity: Kelvin and Maxwell models, generalized models		
11	Viscoelasticity: Creep and relaxation functions		
12	Biofluid mechanics: Basic definitions and viscosity		
13	Biofluid mechanics: Continuity equation and momentum equation		
14	Biofluid mechanics: Fully developed laminar flow		
15	Current applications		
16	Final examination		
17	Resit examination		

Course Learning Outcomes

No	Learning Outcomes
C01	Understanding the basic mechanical properties of living tissues such as bone, muscle, ligament and tendon
C02	To be able to evaluate and criticize human activities in the light of learned mechanical information
C03	Understanding the laws of mechanics and applying these laws conceptually to biomaterials
C04	To understand human movements in a precise and well-defined way in mechanical anatomical terms

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	3	39
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	25	25
Total Work Load			**121**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	3	4	4	2	2	3	2	2	2	2	2
C01	3	3	4	4	2	2	3	2	2	2	2	2
C02	3	3	4	4	2	2	3	2	2	2	2	2
C03	3	3	4	4	2	2	3	2	2	2	2	2
C04	3	3	4	4	2	2	3	2	2	2	2	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4025	Inventive Problem Solving in Engineering Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4025	Inventive Problem Solving in Engineering Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The course will include the definition of engineering problems, classification of problems open ended and closed ended problems, engineering designs; conceptual design, embodiment design, detailed design, concurrent engineering, team work, human as a social entity in team works, project management, project proposal writing, an innovative problem solving technique: TRIZ (Theory of Inventive Problem Solving)
Teaching Methods and Techniques:
Engineering designs; conceptual design, embodiment design, detailed design, Materials and Process Selection, the definition of quality characteristics
Prerequisites and co-requisities:

Course Coordinator:
Dr. mehmet bakırcı
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	İnventive Problem Solving in Engineering Design Course Notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	5
Engineering	:	20	**Science**	:	10
Engineering Design	:	20	**Health**	:	5
Social Sciences	:	20	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Definition of engineering problems		
2	Classification of problems open and closed ended problems		
3	Engineering designs; conceptual design, embodiment design, detailed design		
4	Design techniques		
5	Concurrent engineering		
6	Team work, human as a social entity in team works		
7	Materials and Process Selection, the definition of quality characteristics		
8	midterm		
9	Ideas through innovative projects and An innovative problem solving technique:TRIZ (Theory of nventive Problem Solving)		
10	Project management: Constructing a project proposal		
11	Managing a project		
12	Project proposal writing		
13	Perform Presentations		
14	Perform Presentations		
15	final exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Understanding of engineering problems; ;
C02	Finding engineering solutions to the problems and design product/process in light of the solutions;
C03	Team Work
C04	Project proposal writing and managing projects according to the proposals
C05	Improvement of students' written and oral communication;
C06	Development of innovative thinking

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%20
Quizzes	0	%0
Assignment	0	%20
Attendance	0	%0
Practice	0	%10
Project	0	%20
Final examination	0	%30
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	45	45
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	45	45
Total Work Load			**118**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	3	3	3	3	3	3	3	3	3	3	3	3
C01	3	3	3	3	3	3	3	3	3	3	3	3
C02	3	3	3	3	3	3	3	3	3	3	3	3
C03	3	3	3	3	3	3	3	3	3	3	3	3
C04	3	3	3	3	3	3	3	3	3	3	3	3
C05	3	3	3	3	3	3	3	3	3	3	3	3
C06	3	3	3	3	3	3	3	3	3	3	3	3

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4028	Machine Technology				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4028	Machine Technology	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Having knowledge about machine tools industry. Defining optimal and economical machine tools selection criteria according to machining process. Designing of driving systems and mechanism in machine tools according to machine tool construction. Choosing proper machine tool and equipments according to machining quality. Having knowledge about machine tools and their operation areas.
Teaching Methods and Techniques:
Classification of machine tools. Driving systems and construction of machine tools, design principles of machine tools, turning machines, milling machines, sawing machines, drilling machines, broaching machines, grinding machines, gear cutter machines, super finish machines. CNC Machinetools, Numerical Micro and nano machine tools, smart machine tools.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Ahmet Fatih Yılmaz
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Talaş Kaldırma Bilimi ve Teknolojisi CNC Takım Tezgahları ve Üretim Otomasyonu, Mustafa AKKURT, Birsen Yayınevi, 2009 Takım Tezgahları Tasarımı, Faruk MENDİ, Gazi
Talaş Kaldırma Bilimi ve Teknolojisi CNC Takım Tezgahları ve Üretim Otomasyonu, Mustafa AKKURT, Birsen Yayınevi, 2009
Takım Tezgahları Tasarımı, Faruk MENDİ, Gazi Kitapevi, 1999
Takım Tezgahları, H. Oktay BODUR, Birsen Yayınevi, 1984
Takım Tezgahları, Faruk AKÜN, İTÜ Yayınları, 1973-1978, Cilt 1 ve 2
Lecture Notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	30	**Science**	:	30
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Machine tools, basic concepts and classifications		Lecture Notes Part 1
2	Constructive structures of machine tools and elements		Lecture Notes Part 2
3	Drive systems in machine tools		Lecture Notes Part 2
4	Mechanisms in machine tools		Lecture Notes Part 2
5	Working principles of lathe and its mechanism		Lecture Notes Part 3
6	Working principles of drilling machine tool and its mechanism		Lecture Notes Part 3
7	Working principles of milling machine tool and its mechanism		Lecture Notes Part 3
8	Midterm 1		
9	Working principles grinding and superfinish machine tool, their mechanism		Lecture Notes Part 4
10	Working principles of broaching and planing machine tools and their mechanism		Lecture Notes Part 5
11	The functions, working principles and mechanisms of gear benches		Lecture Notes Part 6
12	Saw cutting machine tools and their mechanism		Lecture Notes Part 7
13	Numerical controlled machine tools- general principles		Lecture Notes Part 8
14	Accuracy in machine tools and test methods		Lecture Notes Part 9
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Gaining information about design, production and application of machine tools.
C02	Gaining inforation about turning machines, milling machines, sawing machines, drilling machines, broaching machines, grinding machines, gear cutter machines, super finish machines.
C03	Gaining ability of choosing appropriate machine tool for machining operations.
C04	Gaining knowledge about construction of machine tools and main drive mechanisms.
C05	Gaining knowledge about construction elements of machine tools.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	13	2	26
Hours for off-the-c.r.stud	13	2	26
Assignments	4	10	40
Presentation	2	8	16
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	8	8
Total Work Load			**126**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	3	4	3	3	4	4	4	4	5	3	3
C01	5	3	4	3	3	4	4	4	5	5	4	4
C02	4	3	5	3	3	3	4	4	4	5	3	3
C03	5	3	4	2	4	4	4	4	5	5	4	4
C04	4	3	3	2	3	3	4	4	4	5	3	3
C05	5	3	4	4	3	4	4	4	4	5	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4017	Maintenance in Manufacturing				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4017	Maintenance in Manufacturing	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
"1. To introduce main subjects and updated concepts related quality. 2. To introduce SPC methods and related computer programs. 3. To give some information about inspection and measuring quality during manufacturing. 4. To introduce tools which used for determining and improving quality. 5. To introduce acceptance methods required for manufacturers and suppliers"
Teaching Methods and Techniques:
"Quality, quality control and quality assurance concepts. Total Quality Management. Quality design, design quality and application quality, QFD and quality house. Statistical processes, risc and tolerance concepts. Acceptance samplings. Measurement. Statistical process control. Control diagrams. ISO 9000. Outsourcing. Benchmarking. FMEA. CE. Kanban, 6 sigma, Lean production. Reliability."
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. Selami Sağıroğlu
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Fundamentals of Modern Manufacturing, M.Groover
	Fundamentals of Modern Manufactruing, Manufacturing and Engineering
	-
	3
	2

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	10
Engineering	:	20	**Science**	:	20
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Quality, quality control, quality assurance, Total Quality Management, history.		
2	Quality, quality control, quality assurance, Total Quality Management, history.		
3	Measurement equipment. Statistical processes, risc and tolerance concepts.		
4	Measurement equipment. Statistical processes, risc and tolerance concepts.		
5	Statistical process control. Pareto analysis, fishbone diagram etc.		
6	Control limits and control diagrams. X/R ve X/? control diagrams. Discussions.		
7	TQM		
8	TQM		
9	ISO 9000. QS 9000 , ISO 16949		
10	FMEA		
11	FMEA		
12	Kaizen, Kanban,		
13	Kaizen, Kanban,		
14	CE. Reliability		

Recommended Optional Programme Components

MEE4048 Manufacturing Planning

Course Learning Outcomes

No	Learning Outcomes
C01	be familiarized with the quality and related subjects
C02	recognize the software like Excel etc. used in statistical applications
C03	be familiarized with measurement and quality improvement subjects during manufacturing
C04	be familiarized with quality certificates applications and methods
C05	be familiarized with methods required to acceptance as manufacturer or supplier.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	2	12	24
Assignments	19	3	57
Presentation	0	0	0
Mid-terms	15	1	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	28	1	28
Total Work Load			**152**
ECTS Credit of the Course			**6**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	5	4	4	4	3	3	2	3	3	2
C01	5	5	5	4	4	4	3	3	2	3	3	2
C02	5	5	5	4	4	4	3	3	2	4	3	2
C03	5	5	5	4	4	4	3	3	2	3	3	2
C04	5	5	5	4	4	4	3	3	2	3	3	2
C05	5	5	5	4	4	4	3	3	2	3	3	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4048	Manufacturing Planning				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4048	Manufacturing Planning	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Understanding and analysis of manufacturing production lines, flexible manufacturing cells, group technology and part of the lecture
Teaching Methods and Techniques:
Basic concepts; production phases of the product, manufacturing systems, automation, with the help of computer design (CAD), with the help of computer manufacturing (CAM), computer integrated manufacturing (CIM). Manufacturing systems, manufacturing and process planning, production capacity for calculating techniques
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Hasan GÖKKAYA
Assistants:

Recommended or Required Reading

Resources 1. Mikell P. Groover, 'Automation, Production Systems, and Computer Integrated Manufacturing', Prentice-Hall, Inc, Englewood Cliffs, New Jersey, 1991, ISBN: 0-13-0546

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	20	**Science**	:	10
Engineering Design	:	20	**Health**	:	0
Social Sciences	:	5	**Field**	:	5

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction: Terminology and Definitions (Automation, Manufacturing Industries, CAD / CAM)		
2	Detroit-type automation: Definitions, production lines, transfer systems, inventory areas, control systems.		
3	Analysis of production lines: Terminology.		
4	Analysis of production lines: Mathematical analysis.		
5	Analysis of production lines: Mathematical analysis.		
6	Analysis of production lines: Partial automation.		
7	Analysis of production lines: Full automation.		
8	Group Technology (GT) Classification and coding of parts.		
9	Group Technology (GT) Production flow analysis.		
10	Group Technology (GT) Machine cell design.		
11	Flexible manufacturing cells (FMC): Part of the control and cells		
12	Flexible manufacturing cells (FMC): Part of the control and cells		
13	Heat treatment can be applied to non-ferrous alloys.		
14	Laboratory of the project-presentation, discussion and evaluation		

Course Learning Outcomes

No	Learning Outcomes
C01	1. Analyze production lines
C02	2. Recognize flexible production cells and group technology.
C03	3. Identify CAD, CAM ve CID issues.
C04	4. Calculate capability of production capasity.
C05	5. Explain numerical control principles and working principles of numerical control machining tools
C06	6. Plan manufacturing systems, manufacturing and process.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	13	2	26
Assignments	2	15	30
Presentation	0	0	0
Mid-terms	1	18	18
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	22	22
Total Work Load			**124**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	1	2	3	1	2	1	2	3	1	4	4	4
C01	1	2	3	1	2	1	2	3	1	4	4	4
C02	2	2	2	1	2	1	2	3	1	4	4	4
C03	1	2	3	1	2	1	2	3	1	4	4	4
C04	1	2	3	1	1	1	2	2	1	4	4	4
C05	1	2	3	1	2	1	2	1	1	4	4	4
C06	1	2	3	1	1	1	2	3	1	4	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4013	Materials Inspection Methods				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4013	Materials Inspection Methods	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is teaching non-destructive inspection and destructive methods that used commonly in industry
Teaching Methods and Techniques:
The importance of quality control and quality control methods. Widely used non-destructive inspection methods; liquid penetrant, magnetic particle, ultrasonic, radyografik (x-ray, gamma), with eddy currents and other methods of examination. Introduction to destructive methods
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdullah UĞUR

Recommended or Required Reading

Resources	Kundu, T., & Placko, D. (Eds.). (2007). Advanced ultrasonic methods for material and structure inspection. London and Newport Beach: ISTE.,Owen, Mark, Adrian Boyle, 1. Türkçe, Kitap, Manual for Materials Inspection, Illinois Department of Transportation, 2011 , , 0000.

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	0
Engineering	:	40	**Science**	:	10
Engineering Design	:	30	**Health**	:	0
Social Sciences	:	0	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Quality, Quality Control and Control Methods		
2	Non-Destructive Testing Methods and Application Areas		
3	Factor Intensity and Voltage, Various Crack Formation in		
4	Breaking Mechanism and Material Strength and toughness of the materials		
5	Magnetic Particle Testing Method and Magnetic Fields		
6	Demanyetization and Importance		
7	Acoustic Emission Test Methods		
8	Eddy Current Test Method and Signal Generation		
9	Eddy Current Test Method and Signal Generation		
10	Ultrasonic Energy and Test Methods		
11	Used in Ultrasonic Testing Methods Measuring Equipment and discontinuous functions		
12	Radiographic Test Method		
13	Radiography Radiation Sources, Films, and Security		
14	Liquid penetrant Test Method		

Course Learning Outcomes

No	Learning Outcomes
C01	1. Recognize quality, quality control and control methods
C02	2. Explain Non-destructive inspection methods and practices of the the area
C03	3. Recognize the breaking mechanism
C04	4. Identify acoustic emission testing methods, Ultrasonic and Radiography methods
C05	5. Apply destructive testing methods
C06	6. Recognize eddy currents and other methods

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	2	20	40
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	22	22
Total Work Load			**119**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P05	P12
All	2	5	4	5	4
C01	2	5	4	5	4
C02	2	5	4	5	4
C03	2	5	4	5	4
C04	2	5	4	5	4
C05	2	5	4	5	4
C06	2	5	4	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4012	Materials Selection in Design and Manufacturing				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4012	Materials Selection in Design and Manufacturing	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to give information about material selection and production in machine design.
Teaching Methods and Techniques:
Basics of material selection, Material selection in terms of mechanical properties, Material selection in terms of physical properties, Material selection and design, Materials used in machine design and their properties.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Ahmet Emrah Erdoğdu
Assistants:

Recommended or Required Reading

Resources	Malzeme seçimi ve uygulamaları (Prof. Dr. Fehim Fındık), Principles of Materials Science and Engineering (William F. Smith), Materials Selection in Mechanical Design (Mic -

Course Category

Mathmatics and Basic Sciences	:	15	**Education**	:	
Engineering	:	25	**Science**	:	10
Engineering Design	:	25	**Health**	:	
Social Sciences	:		**Field**	:	25

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basics of Material Selection	-	-
2	Engineering Materials and Properties	-	-
3	Material Design and Selection	-	-
4	Material Cards	-	-
5	Material Selection for Strength	-	-
6	Material Selection for Creep, Corrosion and Wear	-	-
7	Material Selection for Toughness and Fatigue	-	-
8	Steel Material Selection	-	-
9	Steel Material Selection	-	-
10	Steel Material Selection	-	-
11	Material selection applications in machine designs	-	-
12	Material selection applications in machine designs	-	-
13	Determination of optimum conditions in material selection	-	-
14	Determination of optimum conditions in material selection	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Classifying the materials and understanding the issues that need to be considered in material selection.
C02	Analyze the manufacturing methods to be applied to materials used in machine design.
C03	Can determine suitable materials according to working conditions of machine elements.
C04	Can analyze the environmental factors that the machine will operate.
C05	It can choose the most suitable materials for the machine parts to be manufactured.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	2	28
Assignments	1	30	30
Presentation	0	0	0
Mid-terms	1	12	12
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**127**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	5	4	4	3	2	4	5	4	5	5
C01		4										
C02			5	4					4			
C03			4		4							
C04	4						4			4		4
C05						4		5			4	

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE407	Makina Mühendisliği Laboratuvarı				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE407	Makina Mühendisliği Laboratuvarı	4	3	4

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The aim of this course is to provide the student with the ability to design, set up and calibrate any experimental setup in line with basic mechanical engineering subjects, and to write a technical report in which the results of the experiments are evaluated by conducting experiments to measure system outputs.
Teaching Methods and Techniques:
Static, dynamic, strength, material, control and measurement of mechanical engineering Conducting experiments in their fields. Within the scope of the course, students will be able to design, set up and calibrate the experimental setup in groups using the basic mechanical engineering knowledge they have received during their undergraduate education, and prepare reports that include the calculation of system outputs based on the inputs as a result of the experiments.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Hasan GÖKKAYA
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Cobb, G.W., Introduction to design and analysis of experiments, Springer, 1998.,Montgomery, D.C., Design and analysis of experiment, 4th ed., John Wiley and Sons, 19

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	30	**Science**	:	20
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Statistical Methods in Engineering, Determination of Moment of Inertia		
2	Statistical Methods in Engineering, Determination of Moment of Inertia		
3	Strain Measurements in Inset Beams		
4	Strain Measurements in Inset Beams		
5	Investigation of the Effect of Cutting Speed ??on Surface Roughness		
6	Investigation of the Effect of Cutting Speed ??on Surface Roughness		
7	Determination of Elasticity and Shear Elasticity Modules in Materials by Bending and Torsion Tests		
8	Determination of Elasticity and Shear Elasticity Modules in Materials by Bending and Torsion Tests		
9	Vibration of the Harmonic Force-Forced undamped System		
10	Vibration of the Harmonic Force-Forced undamped System		
11	Vibration of the Harmonic Force-Forced undamped System		
12	Determining Dynamic Response of Systems		
13	Determining Dynamic Response of Systems		
14	Determining Dynamic Response of Systems		

Course Learning Outcomes

No	Learning Outcomes
C01	design any experimental setup related to mechanical engineering,
C02	establish any experimental setup related to mechanical engineering,
C03	calibrate any mechanical engineering experimental setup,
C04	make an established or ready experiment,
C05	to evaluate the experimental results,
C06	prepare and present a technical report containing the results of the experiment.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%10
Total		**%50**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	1	12	12
Presentation	0	0	0
Mid-terms	1	16	16
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	20	20
Total Work Load			**90**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P09	P12
All	1	4	4	5	5	2	5
C01	1	4	4	5	5	2	5
C02	1	4	4	5	5	2	5
C03	1	4	4	5	5	2	5
C04	1	4	4	5	5	2	5
C05	1	4	4	5	5	2	5
C06	1	4	4	5	5	2	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4050		Mechanical Measurements and Metrology			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4050	Mechanical Measurements and Metrology	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To give some knowledge about basic principles of measurement, To develope skills in team studies, To teach the principles of operation, calibration techniques and application guidelines for basic measurement equipment, To give information about measurement system design and their application, To teach how to use various measurement techniques.
Teaching Methods and Techniques:
Basics of metrology and its importance in engineering. Measuring instruments used in machine manufacturing process, calibration and measurement applications. Analysis and statistical evaluation of experimental data. Quality standards, quality control, inspection and testing.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Ahmet Emrah Erdoğdu
Assistants:

Recommended or Required Reading

Resources	Engineering Metrology and Measurements (N.V. Raghavendra, L. Krishnamurthy),Theory and Design for Mechanical Measurements (Richard S. Figliola),Mechanical Measu -

Course Category

Mathmatics and Basic Sciences	:	15	**Education**	:	
Engineering	:	25	**Science**	:	25
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	25

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Metrolojinin Amacı	-	-
2	Analysis of experimental data	-	-
3	Analysis of experimental data	-	-
4	Static and Dynamic Characterization, Selection Criteria.	-	-
5	Measuring methods and measuring elements	-	-
6	Pressure Measurement	-	-
7	Flow measurement	-	-
8	Temperature measurement	-	-
9	Torque and Speed Measurement	-	-
10	Measurement with Optical and Image Analysis	-	-
11	Measurement with Optical and Image Analysis	-	-
12	Data collection and processing	-	-
13	Report writing and presentation	-	-
14	Report writing and presentation	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Gains the necessary knowledge and skills to use experimental methods, data analysis techniques and the concept of acceptance tolerance in engineering applications.
C02	Can define measurement methods and measurement elements.
C03	Ability to apply what has been learned in basic science lessons to design experiments and make judgments about the quality and accuracy of their measurements.
C04	To be able to analyze experimental data.
C05	Gains the ability to present oral or written reports effectively.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	2	28
Assignments	1	20	20
Presentation	0	0	0
Mid-terms	1	12	12
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**117**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4041	Mechanical Vibrations				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4041	Mechanical Vibrations	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
In this course, it is aimed to teach the classification, modeling, analysis of vibrations that will occur in mechanical systems and methods of eliminating the vibrations that will occur.
Teaching Methods and Techniques:
Basic concepts of vibrating systems, single degree of freedom damped and undamped free vibrations, forced vibrations, systems with two or more degrees of freedom, vibration measurement and protection methods.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Fatih PEHLİVAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Mekanik Titreşimler, Prof. Dr. Fuat Pasin.,Mechanical Vibrations, S.S. Rao, Prentice Hall.

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	30

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic concepts of vibrating systems		
2	Basic concepts of vibrating systems		
3	Harmonic motion		
4	Free vibration of single degree of freedom systems		
5	Forced free vibrations of single degree of freedom systems		
6	Forced free vibrations of single degree of freedom systems		
7	Forced free vibrations of single degree of freedom systems		
8	Midterm Exam		
9	Two degree of freedom systems and the eigenvalue problem		
10	Two degree of freedom systems and the eigenvalue problem		
11	Multi-degree of freedom systems and modal analysis		
12	Multi-degree of freedom systems and modal analysis		
13	Vibration measurement and measuring systems		
14	Design principles and industrial applications to reduce vibrations		
15	Design principles and industrial applications to reduce vibrations		
16	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	They will be able to determine the types and components of vibrating systems
C02	They will be able to construct a mathematical model for vibrating systems
C03	They will be able to write the equations of motion of vibrating systems
C04	They will be solve the motion equations of vibrating systems using different methods,
C05	They will be able to analyzes the performance characteristics of vibrating systems,
C06	They will be able to identify and solve vibration problems of mechanical systems in real life

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	3	36
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	16	16
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	24	24
Total Work Load			**118**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	4	3	4	5	2	2	3	2	5	3	3
C01	4	4	3	4	5	2	2	3	2	5	3	3
C02	4	4	3	4	5	2	2	3	2	5	3	3
C03	4	4	3	4	5	2	2	3	2	5	3	3
C04	4	4	3	4	5	2	2	3	2	5	3	3
C05	4	4	3	4	5	2	2	3	2	5	3	3
C06	4	4	3		5	2	2	3	2	5	3	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4018		Mechatronic Systems Design			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4018	Mechatronic Systems Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To teach basic concepts about mechatronic systems, to introduce mechatronic systems with industrial application examples; To introduce mechatronic system elements. To teach students new thinking structures in machine and system design.
Teaching Methods and Techniques:
Definition of Mechatronics, History of Mechatronics, Mechatronics System, Applications and Interests of Mechatronics, Mechatronic System Examples, System Modeling and Simulation, Control Systems, Motors (AC, DC, Servo, Step), Electronic Circuit Elements, Sensors, Actuators, Mechanical and Electro- Mechanical Systems (Robots), Hydraulic and Pneumatic Systems, Automatic Control Applications
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Fatih PEHLİVAN
Assistants:

Recommended or Required Reading

Resources 1. W. Bolton, Mechatronics Çevirmen B. Koray Tunçalp (Dahi Yayınları, 2009).,2. Mechatronik in Theorie und Praxis, Bosh Automation, (2. Edition, 1999).

Course Category

Mathmatics and Basic Sciences	:	**Education**	:
Engineering	: 50	**Science**	:
Engineering Design	: 50	**Health**	:
Social Sciences	:	**Field**	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	What is Mechatronics? History of Mechatronics		
2	Mechatronics System, Applications and Interests of Mechatronics		
3	Mechatronic System Examples		
4	System Modeling and Simulation		
5	Control Systems		
6	Motor Types (AC, DC, Servo, Step)		
7	Electronic Circuit Elements		
8	MIDTERM EXAM		
9	Actuators		
10	Actuators		
11	Mechanical and Electro-mechanical Systems		
12	Hydraulic and Pneumatic Systems		
13	Automatic Control Applications		
14	Automatic Control Applications		
15	Automatic Control Applications		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will gain the ability to analyze mechatronic systems.
C02	Students will gain the ability to select tools and equipment for mechatronic systems.
C03	Students will gain skills in project development and business management.
C04	Students will gain the ability to follow mechatronic developments.
C05	Students will gain the development of feedback control design ability.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	13	13
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**126**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	5	5	5	5	5	5	1	5	4	5	3	5
C02	5	5	5	5	5	5	1	5	4	5	3	5
C03	5	5	5	5	5	5	1	5	4	5	3	5
C04	5	5	5	5	5	5	1	5	4	5	3	5
C05	5	5	5	5	5	5	1	5	4	5	3	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4060	Medical Device Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4060	Medical Device Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Major advances in technology are driving innovation in healthcare. On this course, students will explore the global landscape of medical device trends by looking at the past, present, and future of medical technology development.
Teaching Methods and Techniques:
Students will be introduced to the key factors driving the development of innovative medical equipment, and learn how medical devices are classified. Students will also explore medical device regulation as they follow the product development process of a new medical device, from identifying the clinical need to launching the final product.
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Emrah DENİZ
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Ogrodnik, Peter, Medical Device Design 2nd Edition Innovation from Concept to Market (Academic Press 2020)

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:		**Science**	:	20
Engineering Design	:	40	**Health**	:	40
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	History of Medical Technologies and how Medical Technologies products have been developed.		
2	History of Medical Technologies and how Medical Technologies products have been developed.		
3	The forces driving innovation in the Medical Technologies sector.		
4	The forces driving innovation in the Medical Technologies sector.		
5	Challenges for Medical Technologies products to overcome.		
6	Challenges for Medical Technologies products to overcome.		
7	How do we make sure Medical Technologies products are safe?		
8	MIDTERM EXAM		
9	How do we make sure Medical Technologies products are safe?		
10	Establishing a patient and clinical need for a product.		
11	Establishing a patient and clinical need for a product.		
12	Designing products with regulations in mind.		
13	Designing products with regulations in mind.		
14	Bringing a product to market.		
15	Bringing a product to market.		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to discuss the impact of medical technologies on anticipated future demands for improved healthcare.
C02	Students will be able to describe the medical device development process, from clinical need through to regulatory approval and product introduction.
C03	Students will be able to explain the opportunities and challenges encountered during the medical device product development process
C04	Students will be able to apply a medical device development process to an exemplar Medical Technologies product.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	4	48
Assignments	4	4	16
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			**131**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	3	3	5	5	5	3	4	4	4	5	5	3
C02	3	3	5	5	5	3	4	4	4	5	5	3
C03	3	3	5	5	5	3	4	4	4	5	5	3
C04	3	3	5	5	5	3	4	4	4	5	5	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4045	Metal Forming Technologies				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4045	Metal Forming Technologies	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To introduce mechanical properties from the view point of stress and strain, to analyses plastic deformation behavior of materials, The effect of temperature and strain rate sensitivity on plastic deformation behavior of materials.
Teaching Methods and Techniques:
Plastic forming technology, which has been utilized to form metallic materials for several decades, is a manufacturing method having special importance in metallurgy industry. Recent technological developments in the field of plastic forming processes have made this lecture an important vocational lecture for metallurgy and materials engineers. In the lecture, after the explanation of the basic theories of plastic forming of metallic materials, technological applications will be discussed.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdullah UĞUR

Recommended or Required Reading

Resources EngIneerIng MaterIals, An IntroductIon to theIr Properties and Applications, Pergamon Press, Oxford, 1983.,İngilizce, Kitap, MechanIcal Metallurgy, McGraw HIll Book Co

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	0
Engineering	:	40	**Science**	:	10
Engineering Design	:	30	**Health**	:	0
Social Sciences	:	0	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction, Description of plastic forming processes		
2	Relationships between Stress and Strain		
3	Mohr circles and yield criteria.		
4	Plastic deformation mechanisms and strain hardening		
5	Plastic deformation mechanisms and strain hardening		
6	Factors affecting plastic deformation		
7	Furnaces utilized in plastic forming operations.		
8	Forging, Rolling		
9	Mid-Term Exam		
10	Extrusion		
11	Wire drawing and pipe production.		
12	Forming of metallic sheets.		
13	Problem solving		
14	Presentations of the students' assignment: discussion and evaluation.		

Course Learning Outcomes

No	Learning Outcomes
C01	Discuss the effect of plastic deformation on the structure
C02	Discuss the effect of properties of materials on the basis of deformation temperature
C03	Interpret the effect of applied loads on materials,
C04	Calculate the forces required for a plastic forming process
C05	Recommend optimum plastic deformation method for a certain product.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	2	20	40
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	22	22
Total Work Load			**119**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P10	P12
All	2	5	4	4	5	3	4
C01	2	5	4	4	5	3	4
C02	2	5	4	4	5	3	4
C03	2	5	4	4	5	3	4
C04	2	5	4	4	5	3	4
C05	2	5	4	4	5	3	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4054		Microprocessors in Engineering			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4054	Microprocessors in Engineering	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Having the student gain an understanding of the structure of microprocessors, Giving the fundamental concepts of low-level programming techniques, Teaching the functions and uses of microprocessor modules like PIA, PTM.
Teaching Methods and Techniques:
Microprocessors in Engineering, and their engineering Applications. Basic Structures of Microprocessors. Number Systems. Arithmetics of Binary and Hexadecimal Number Systems. Basic Programming Techniques. Addressing Techniques. Arithmetic, Logic and Flow Control Commands. Data Transfer Commands. Input-Output Interface. Pulse and Timing Module. Analog/Digital Converters. Digital/Analog Converters. Application Examples.
Prerequisites and co-requisities:

Course Coordinator:
Dr. Özden İŞBİLİR
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources	Intelligent Instrumentation: Microprocessor Applications in Measurement and Control, G.C.Barney, Pearson Education Limited, 1988,Microprocessors and Control, J.F.A.Th Microprocessors in Engineering course notes

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	40	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Historical development and basic structures of microprocessors		
2	Basic structures of microprocessors		
3	Number systems and arithmetics (Hexadecimal and binary, in particular)		
4	Programming techniques and examples		
5	Programming techniques and examples: Addressing methods		
6	Programming techniques and examples: Data transfer commands		
7	Programming techniques and examples: Arithmetic commands		
8	Programming techniques and examples: Logic commands		
9	Midterm examination		
10	Programming techniques and examples: Flow control commands		
11	Programming techniques and examples: Applications		
12	Introduction to the Input/Output Interface and its programming		
13	Introduction to the Pulse and Timing module		
14	Basic structures of the ADC and DAC converters		
15	Types of the ADC and DAC converters		
16	Final examination		
17	Resit examination		

Course Learning Outcomes

No	Learning Outcomes
C01	Learn general knowledge about microprocessor structures
C02	Obtain skill in low-level programming techniques and program development
C03	Obtain knowledge on microprocesor auxiliary units and skill in preparing protocol software
C04	Learn basic knowledge required for microprocessor control of systems

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	13	3	39
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	25	25
Total Work Load			**121**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	4	5	4	4	3	3	2	2	2	2	4
C01	4	4	5	4	4	3	3	2	2	2	2	4
C02	4	4	5	4	4	3	3	2	2	2	2	4
C03	4	4	5	4	4	3	3	2	2	2	2	4
C04	4	4	5	4	4	3	3	2	2	2	2	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4026		Microsystem – MEMS Design			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4026	Microsystem – MEMS Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Key topics in micro-electro-mechanical systems (MEMS) and properties of materials; microelectronic process modules for design and fabrication.
Teaching Methods and Techniques:
Introduction to MEMS, MEMS Process: Microfabrication Technology, MEMS Process: Photolithography, MEMS Process: Deposition and Doping, MEMS Process: Etching, Mechanics Design for MEMS Devices
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Kamil ARSLAN
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources MICROMACHINED TRANSDUCERS SOURCEBOOK 1ST EDITION BY GREGORY KOVACS,PRACTICAL MEMS: DESIGN OF MICROSYSTEMS, ACCELEROMETERS, GYROSCOPES

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	0
Engineering	:	50	**Science**	:	10
Engineering Design	:	10	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to MEMS		
2	Definitions and Fundamental Principles		
3	MEMS Process: Microfabrication Technology		
4	MEMS Process: Photolithography		
5	MEMS Process: Deposition and Doping		
6	MEMS Process: Deposition and Doping		
7	MEMS Process: Etching		
8	Polymer MEMS		
9	Polymer MEMS		
10	Soft MEMS and Robotics		
11	Soft MEMS and Robotics		
12	Flexible MEMS I: Transfer Printing Methods		
13	Flexible MEMS II: Modern Transfer Printing Methods		
14	Mechanics Design for MEMS Devices		

Course Learning Outcomes

No	Learning Outcomes
C01	Key aim is to learn micro-electro-mechanical systems (MEMS) and micro-integrated system.
C02	Properties of useful materials will be learned in context to MEMS.
C03	Applications of MEMS systems in a variety of sensors and transducers for broad ranges of implantable biomedical applications will be understood.
C04	Recent advances in wearable biomedical applications of MEMS will be learned in detail.
C06	The students will be informed about the MEMS design.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	3	%10
Attendance	0	%0
Practice	7	%5
Project	1	%5
Final examination	1	%40
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	3	42
Assignments	3	2	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	7	2	14
Laboratory	0	0	0
Project	1	3	3
Final examination	1	5	5
Total Work Load			**117**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	5	3	1	2	1	5	1	4	3	1	4
C01	4	5	3	1	2	1	5	1	4	3	1	4
C02	4	5	3	1	2	1	5	1	4	3	1	4
C03	4	5	3	1	2	1	5	1	4	3	1	4
C04	4	5	3	1	2	1	5	1	4	3	1	4
C06	4	5	3	1	2	1	5	1	4	3	1	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4010	Modern Manufacturing Methods				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4010	Modern Manufacturing Methods	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To introduce principles of modern manufacturing methods. Selection of the most appropriate method for manufacturing the technical information that may be able to introduce students
Teaching Methods and Techniques:
Introduction to advanced production methods, with the electron beam processing, ion beam treatment, chemical processing, with Electro-erosion machining, ultrasonic machining, laser beam and processing, water jet machining, Plasma arc manufacturing, Rapid Prototyping and private methods.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Hasan GÖKKAYA
Assistants:

Recommended or Required Reading

Resources Brown, J. A. (1991). Modern manufacturing processes. Industrial Press Inc..

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	0
Engineering	:	25	**Science**	:	10
Engineering Design	:	25	**Health**	:	0
Social Sciences	:	5	**Field**	:	25

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to Advanced manufacturing methods		
2	Electron beam treatment		
3	Electron beam treatment		
4	Electro-erosion treatment		
5	Electro-erosion treatment		
6	Ultrasonic Machining		
7	Ultrasonic Machining		
8	Laser beam machining		
9	Laser beam machining		
10	Water jet machining		
11	Water jet machining		
12	Manufacturing plasma arc		
13	Manufacturing plasma arc		
14	Rapid Prototyping and private methods		

Course Learning Outcomes

No	Learning Outcomes
C01	Recognize modern manufaturing method (Electron beam,Ion Beam,Chemical processing, Laser beam, Water jet, Rapid prototyping,private methods).
C02	Identify and explain the difference between manufactureing methods.
C03	Analyze and organize manufacturing systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	1	15	15
Presentation	0	0	0
Mid-terms	1	20	20
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	3	15	45
Total Work Load			**122**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	4	2	4	4	2	2	5	2	5	2	3
C01	5	4	2	5	4	1	1	5	2	5	2	4
C02	5	4	2	5	4	2	2	4	2	4	2	4
C03	5	4	2	5	4	1	1	3	1	5	1	3

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4051	Pipeline Engineering				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4051	Pipeline Engineering	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
- To introduce students to the crucial role of piping engineer in turn key projects - To make students understand the approval drawings and execute the work adhering to procedures and standards - To understand the layout and manage the work with adequate safety and reliability
Teaching Methods and Techniques:
Introduction, Piping system components Drawings and other documents Pressure/temperature/ flexibility design Materials Fabrication, assembly and erection Inspection, examination and testing Mechanical completion/commissioning / preservation
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdulrazzak AKROOT

Recommended or Required Reading

Resources	Piping/mechanical hand book- Mohinder L. Nayyar. Peter H. O. Fischer, Manager, Pipeline Operations, Bechtel,Piping Design Handbook, John J. Mcketta, Marcel Dekker, I

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	
Engineering	:	60	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	INTRODUCTION		
2	Piping	Basic of Piping (Types of pipe manufacti	
3	Piping components, instruments and pipe supports		
4	Types of Valves		
5	Piping Material Specifications		
6	Flow Diagrams		
7	PIPE RACK design		
8	Piping and Equipment Layout – (PlotPlan, Equipment Layout, & Piping GADrawings)		
9	Pipe Supports		
10	Pipe Stress Analysis		
11	Design Calculations of Piping sizing		
12	Design pressure integrity		
13	Hydraulic Design of Piping Systems		
14	Boru Esneklik Analizi		

Course Learning Outcomes

No	Learning Outcomes
C01	Understand the piping fundamentals, codes and standards
C02	Understand pipe fittings, selections, drawings and dimensioning
C03	understand Pipe Material specifications
C04	Understand pressure design of pipe systems

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	6	1	6
Assignments	1	6	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01
C01	5
C02	5
C03	4
C04	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4003	Plumbing Systems Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4003	Plumbing Systems Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The purpose of this course, recognize and plumbing systems, and design can accomplish the required design.
Teaching Methods and Techniques:
All plumbing systems used. City to begin a clean water supply network sudepoları, air pressure tanks, pipe connections, clean water, water heaters, boilers, boilers, hot suhazırlama systems. Building waste water plumbing systems in connection sistemlerive binasıhhi presentation systems such as storm water connection and change these systems, renovation, development, re-designed in accordance with the comforts and diameter of these systems, capacity and power calculations.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources Yapıda Sıhhi Tesisat, Cavit SIDAL, Etem Sait ÖZ, Birsen Yayınevi, 2000.,Sıhhi Tesisat, Isısan Yayını: 272, 2001
Yapıda Sıhhi Tesisat, Cavit SIDAL, Etem Sait ÖZ, Birsen Yayınevi, 2000.

Course Category

Mathmatics and Basic Sciences	:	20	**Education**	:	0
Engineering	:	40	**Science**	:	0
Engineering Design	:	40	**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	What is plumbing? The importance of systems.		
2	City water, the shapes, the application states.		
3	Wet places in the building structure and organization of information.		
4	Indoor and outdoor installation.		
5	Indoor plumbing and partitions.		
6	Pressurization systems, air pressure tanks.		
7	Water tanks and water softening systems.		
8	Midtherm		
9	Plumbing materials and links to three		
10	Clean water supply.		
11	Waste water installations inside buildings, partitions.		
12	Rain water and fire fighting equipment.		
13	Clean and dirty water pipe diameter of the accounts and applications		
14	Clean and dirty water pipe diameter of the accounts and applications		
15	Final		

Course Learning Outcomes

No	Learning Outcomes
C01	Students taking this course to design plumbing systems.
C02	Students taking this course to dimensioning plumbing systems.
C03	Indoor and outdoor installations will learn plumbing systems.
C04	Basic uyugulama and will gain the theoretical knowledge.
C05	Students will learn sanitary of project design and construction contracts.
C06	Students taking this course, the details of a project applying the project's build system and can analyze its correspondence with the elements.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	2	2
Total Work Load			**116**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P06	P07	P08	P09	P10	P11	P12
All	4	5	4	4	1	2	4	3	2	4	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4015	Powder Metallurgy				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4015	Powder Metallurgy	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
To gain professional knowledge that will be able to use existing processes and technological developments in these processes in the production, shaping, determination of properties and evaluation of the products related to powder materials (Process-microstructure-property relationship), and develop suggestions for production optimization at process stages.
Teaching Methods and Techniques:
The place and importance of powder metallurgy in part production in the industry / Powder production methods / Important Properties of Metal Powders, Technological Properties of Powder and its Inspection / Process stages of Powder Metallurgy and Part Manufacturing method, Preparation of powder for pressing, Basic events during the densification and shaping of metal powders / Full Densification methods / Sintering methods and tools, solid and liquid phase sintering stages and mechanisms / Sintered Materials / Coating and similar finishing processes applied to Powder Metallurgical Parts / Recent developments in sintering furnaces / Common industrial application areas of powder metallurgy
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. HARUN ÇUĞ
Assistants:

Recommended or Required Reading

Resources

Toz Metalurjisi ve Parçacıklı Malzeme İşlemleri. Randall M.German, 2007. Powder Metallurgy Science, Randall M.German, Metal Powder Industries Fede. 1994. Sintering T
Powder Metallurgy and Particulate Materials Process. Randall M. German, 2007.
Powder Metallurgy Science, Randall M.German, Metal Powder Industries Fede. 1994.
Sintering Theory and Practice, Randall m.German, A. Wiley-Interscience Public, 1996
Introduction to Physical Metallurgy, Sidney H. Avner, McGraw-Hill Book Company. 1974.
ASM Metals Handbook, Volume 7, Powder Metallurgy, 1993.
Powder Metallurgy lecture notes, Adem Bakkaloğlu, 2014

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	
Engineering	:	40	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	İnrtodustion the powder metallurgy	none	
2	Powder characterization		
3	Powder production		
4	Microstructure control in powders		
5	Powder processes before shaping and densification		
6	Powder forming		
7	Compacting powders		
8	Sintering		
9	Different applications related to powder metallurgy		
10	Full density operations		
11	Finishing operations,		

Recommended Optional Programme Components

MEE205 Materials Sience

Course Learning Outcomes

No	Learning Outcomes
C01	Can comprehend powder metallurgy production techniques used in recent years.
C02	Can characterize the powders produced.
C03	Can understand powder forming principles.
C04	Can comprehend sintering.
C05	Can comprehend the last processes applied to produced parts.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	4	56
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	3	3	9
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	3	3	9
Total Work Load			**116**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03
C01	5	5	2
C02	5	5	2
C03	5	5	2
C04	5	5	2
C05	5	5	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4057	Precision Machine Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4057	Precision Machine Design	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The students will review concepts of statics and strength of materials used to determine the stress, strain and deflection of onedimensional structures.Also, they will learn fundamental approaches to failure prevention for static and repeated loading.They will consider the design of common machine elements such as shafts, fasteners, springs, bearings, and gears besides solving an open-ended design problem involving cost,drawings, and structural analysis.
Teaching Methods and Techniques:
2-D stress, 1-D deflection and stiffness, Failure criteria, Fatigue,Shafts and shaft components, Gears, Springs, Fasteners, Bearings,Other machine elements.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdullah UĞUR

Recommended or Required Reading

Resources	Budynas, R., Nisbett, J.K., Shigley`s Mechanical Engineering Design, McGraw-Hill, 9/e.

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	0
Engineering	:	40	**Science**	:	10
Engineering Design	:	30	**Health**	:	0
Social Sciences	:	0	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to Mechanical Design – Course Overview, Design Process Materials – Material Properties, Materials Selection, (		
2	Load and Stress Analysis – Equilibrium and Free Body Diagrams, Shear Force and Bending Moments, Stress, Strain, Torsior		
3	Deflection and Stiffness – Deflection Due to Bending, Deflection Analysis, Compression, Elastic Stability		
4	Failures Resulting from Static Loading – Static Strength, Stress Concentration, Failure Theories for Ductile and Brittle Mater		
5	Fatigue Failure Resulting from Variable Loading, Fatigue Strength and Endurance Limits, Fluctuating Stresses and Influence		
6	Shafts and Shaft Components – Shaft Materials, Shaft Layout, Shaft design for Stress, Deflection Considerations, Critical S		
7	Gears – Types of Gears, Gear Trains		
8	Gears - Force Analysis, Spur and Helical Gears, Bevel and Worm Gears, Selection of Gears		
9	Mechanical Springs – Stresses and Deflection in Helical Springs, Compression Springs, Stability, Spring Materials		
10	Screws, Fasteners and the Design of Nonpermanent Joints – Thread Standards and Definitions, Threaded Fasteners, Joints		
11	Rolling Contact Bearings and Lubrication – Bearing Types, Bearing Life, Bearing Life, Rating Life, Selection of Bearings		
12	Clutches, Brakes, and Flywheels, Flexible Mechanical Elements		
13	Design Case Studies and Project Presentations		
14	Design Case Studies and Project Presentations		

Course Learning Outcomes

No	Learning Outcomes
C01	Determine the stress, strain and deflection of simple machine elements.
C02	Estimate safety factors of simple structures exposed to static and repeated loads.
C03	Determine performance requirements in the selection of commercially available machine elements.
C04	Solve simple, open-ended design problems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	2	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	14	1	14
Assignments	2	20	40
Presentation	0	0	0
Mid-terms	1	15	15
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	22	22
Total Work Load			**119**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P11	P12
All	5	3	4	5	1	1	2
C01	5	3	4	5	1	1	2
C02	5	3	4	5	1	1	2
C03	5	3	4	5	1	1	2
C04	5	3	4	5	1	1	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4037	Principles of Energy Conversion				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4037	Principles of Energy Conversion	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
1- Compare competing energy conversion technologies on an economic and efficiency basis; 2- Assess the validity of energy conversion claims made in popular media; 3- Be familiar with thermodynamic processes and power cycles; 4- Be familiar with the basic principles of themal, mechanical, chemical, nuclear, and solar energy conversion; 5- Be familiar with the basic principles of energy storage; 6- Serve those around you who are trying to make energy-conscious decisions.
Teaching Methods and Techniques:
Introduction to Energy, Heat Engines & Thermodynamics Thermal-to-Mechanical Energy Conversion (Rankine Cycle) Chemical-to-Thermal Energy Conversion (Fuels & Combustion) Thermal-to-Mechanical Energy Conversion (Brayton Cycle) Nuclear-to-Thermal Energy Conversion (Fission) Electromagnetic-to-Thermal Energy Conversion(Solar) Electromagnetic-to-Electrical Energy Conversion (Solar) Chemical-to-Electrical Energy Conversion (Fuel Cells) Energy Storage
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdulrazzak AKROOT

Recommended or Required Reading

Resources Principles of energy conversion McGraw-Hill series in mechanical engineering,Principles of energy conversion, second edition Culp, A.W. Jr. (Missouri Univ., Rolla, MO (Uni

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	
Engineering	:	60	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to Energy		
2	Energy Perspectives		
3	Energy Economics		
4	Fluid Power and Heat Engines		
5	Thermodynamic Processes and Properties		
6	Rankine Cycle		
7	Brayton Cycle		
8	Chemical Energy (Fuels and Combustion)		
9	Nuclear Energy (Nuclear Decay Reactions)		
10	Nuclear Fission Reactions and Nuclear Reactor Designs		
11	Solar Energy (Insolation & Collectors)		
12	Solar Energy (Storage)		
13	Solar Energy - Photovoltaics		
14	Fuel Cells		

Course Learning Outcomes

No	Learning Outcomes
C01	Know the principles of the modern energy conversion systems
C02	Recognize the energy conversion concepts in complex engineering systems
C03	Do assessments of fundamental properties/quantities of a power plant and/or some of their components
C04	Recognize and identify technical, economical and environmental problems appearing in modern energy conversion systems and their components

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	6	1	6
Assignments	1	6	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01
C01	5
C02	5
C03	5
C04	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4022		Quality Control in Manufacturing			
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4022	Quality Control in Manufacturing	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to teach the methods and quality control. provide information about the importance of quality control of production. Being able to apply statistical methods to teach skills.
Teaching Methods and Techniques:
The definition and importance of quality control, statistical quality control concepts and methods, Probability distributions, seven vehicles in the quality problems, process and equipment qualification, production, inspection and acceptance sampling
Prerequisites and co-requisities:

Course Coordinator:
Associate Prof.Dr. Selami Sağıroğlu
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources
1. Türkçe, Kitap, Dhillon, B.S., Reliability, Quality, and Safety for Engineers, 2004.
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Course Category

Mathmatics and Basic Sciences	:	25	**Education**	:	
Engineering	:	25	**Science**	:	25
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Quality control, quality control methods		
2	The relationship between production and quality control, measurement and quality control devices		
3	Calibration standards and quality control devices		
4	Statistical quality control, statistical quality control advantages of statistical quality control. (7 will be given assignments to		
5	Statistical quality control, statistical quality control benefits, statistical quality control		
6	Arithmetic mean, geometric mean, median		
7	Control scheme and control scheme types, scatter diagrams. (15 projects will be to collect the week)		
8	The peak value, range, standard deviation		
9	Hypergeometric distribution, Poisson probability distribution, normal distribution		
10	Histogram, Pareto analysis, Ishikawa diagram		
11	The process capability, process capability indices		
12	Machine capability, sampling plans in Turkish standards, Philips standard sampling systems		
13	Machine capability, sampling plans in Turkish standards, Philips standard sampling systems		
14	Chain sampling plan, Dodge-Roming plan of Shaming Lot Plot		

Recommended Optional Programme Components

MEE4013 Materials Inspection Methods

Course Learning Outcomes

No	Learning Outcomes
C01	Define the quality control method.
C02	Expresses the relationship between production and quality control.
C03	Understands the measurement techniques.
C04	Define the control scheme.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	1	%10
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	2	14	28
Hours for off-the-c.r.stud	3	12	36
Assignments	10	1	10
Presentation	0	0	0
Mid-terms	10	1	10
Practice	0	0	0
Laboratory	0	0	0
Project	25	1	25
Final examination	16	1	16
Total Work Load			**125**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	4	3	3	4	5	3	4	3	3	4	2
C01	4	4	3	3	4	5	2	3	3	3	4	2
C02	4	4	3	3	4	5	3	4	3	3	4	2
C03	4	4	3	3	4	5	2	3	3	3	4	2
C04	4	4	3	3	4	5	3	4	3	4	4	2

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4001	Solar Energy Technologies				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4001	Solar Energy Technologies	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Introduction to solar energy system and the usage of energy
Teaching Methods and Techniques:
systematic approaches to heat radiation and the efficient usage of energy
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Kamil ARSLANDr. Enes KILINÇDr. Ali CAN
Assistants:

Recommended or Required Reading

Resources

Y. A. Çengel ve A. J. Ghajar, Isı ve Kütle Transferi: Esaslar ve Uygulamalar, 4. Basımdan Çeviri, Çeviri Editörü: Vedat Tanyıldızı, Palme Yayınevi, 2019. ,Y. A. Çengel and A
Y. A. Çengel ve A. J. Ghajar, Isı ve Kütle Transferi: Esaslar ve Uygulamalar, 4. Basımdan Çeviri, Çeviri Editörü: Vedat Tanyıldızı, Palme Yayınevi, 2019.
Y. A. Çengel and A. J. Ghajar, Heat and Mass Transfer: Fundamentals and Applications, 6th Ed., McGraw-Hill, 2020.
F. P. Incropera and D. P. DeWitt, Fundamentals of Heat and Mass Transfer, 6th Ed., John Wiley, 2007.
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Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	50	**Science**	:	
Engineering Design	:	20	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction and basic concepts, solar energy	-	-
2	general energy equation.	-	-
3	functional approaches	-	-
4	Thermal resistance concept and thermal resistance networks.	-	-
5	Heat conduction in cylinders and spheres.	-	-
6	Heat transfer from surfaces.	-	-
7	Transient heat conduction, lumped system analysis.	-	-
8	Midterm exam.	-	-
9	Transient heat conduction in large plane walls, long cylinders and spheres with spatial effects.	-	-
10	External forced convection.	-	-
11	Internal forced convection.	-	-
12	Natural convection.	-	-
13	Fundamentals of thermal radiation.	-	-
15	Sıolar energy systems	-	-

Course Learning Outcomes

No	Learning Outcomes
C01	Learns solar energy mechanisms.
C02	Derives general energy transfer problems.
C03	Gains knowledge about solar energy
C04	Learns fundamentals of radiation heat transfer.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	14	3	42
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	2	2
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**103**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	4	4	2	4	3	1	1	2	1	2	1	1
C01	4	4	1	4	3	1	1	2	1	2	1	1
C02	4	4	2	4	1	1	1	2	1	2	1	1
C03	4	4	2	4	2	1	1	1	1	2	1	1
C04	4	4	2	4	2	1	1	1	1	2	1	1

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE429	Thermal Systems Design				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE429	Thermal Systems Design	3	2	3

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
The goals of this course are to understand engineering design process, to learn characteristics of thermal system components and their effects on overall system performance, and to design and build a thermal system as a team.
Teaching Methods and Techniques:
Applications of principles of thermodynamics, fluid mechanics and heat transfer to design of components and thermal systems. Study of component characteristics and their effect on overall system performance.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Erhan KAYABAŞI
Assistants:

Recommended or Required Reading

Resources	Fundamentals of Heat and Mass Transfer (7th Edition) by Theodore L. Bergman, Adrienne S. Lavine, Frank P. Incropera, David P. DeWitt. Wiley. ISBN-10: 0470501979 or

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	50	**Science**	:	
Engineering Design	:	50	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Design process		
2	Patents		
3	Pressure drop in pipe systems + Design meeting as a team		
4	Pressure drop in pipe systems + Design meeting as a team		

Course Learning Outcomes

No	Learning Outcomes
C01	To understand engineering design process
C02	To learn characteristics of thermal system components and their effects on overall system performance
C03	To design and build a simple thermal system as a team

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	1	14
Assignments	5	6	30
Presentation	0	0	0
Mid-terms	1	10	10
Practice	0	0	0
Laboratory	0	0	0
Project	2	5	10
Final examination	1	10	10
Total Work Load			**116**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	5	5	5	5	5	4	5	5	5	4	5	4

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4032	Thermic Turbo Machines				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4032	Thermic Turbo Machines	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The course aims at providing fundamental knowledge about the design and industrial application of turbomachinery. This involves developing an insight into applied thermodynamics and aerodynamics, as well as to apply this knowledge to a number of technology areas.
Teaching Methods and Techniques:
The course aims at giving a broad introduction to the field of turbomachinery. This is primarily done by describing the work principle and underlying theory of a number of turbomachinery components. The equations describing the energy transfer between the fluid and the rotating component are applied to centrifugal and axial pumps, fans, axial compressors, gas and steam turbines, hydraulic turbines and wind turbines.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Erhan Kayabaşı
Assistants:

Recommended or Required Reading

Resources	Dixon, S.L."Fluid Mechanics and Thermodynamics of Turbomachinery" Fourth edition, Butterworth-Heinemann, 1998.,Seppo A. Korpella, Principles of Turbomachinery, Jol Seppo A. Korpella, Principles of Turbomachinery, John Wiley & Sons Inc, 2020. Dixon, S.L."Fluid Mechanics and Thermodynamics of Turbomachinery" Fourth edition, Butterworth-Heinemann, 1998.

Course Category

Mathmatics and Basic Sciences	:		**Education**	:	
Engineering	:	70	**Science**	:	
Engineering Design	:	30	**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to turbomachinery		
2	Principles of thermodynamics and fluid flow		
3	Compressible flow		
4	Principles of turbomachine analysis		
5	Energy transfer in turbomachines		
6	Incompressible flow		
7	Axial compressors		
8	Midterm exam		
9	Steam turbines		
10	Axial turbines		
11	Centrifugal compressors and pumps		
12	Hyrolic turbines.		
13	Francis turbine		
14	Pelton wheel		
15	Kaplan turbine		

Course Learning Outcomes

No	Learning Outcomes
C01	Solve aerothermodynamic problems for 3D design of turbomachinery blades.
C02	Explain interaction of fluid and structure in thermal turbomachines and relate to the design of included vital components.
C03	Solve problems regarding aeromechanics for turbomachinery blades.
C04	Describe heat transfer for warm components, material aspects, combustion chamber principles and operational characteristics for thermal turbomachines.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%50
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	14	5	70
Assignments	2	4	8
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	3	3
Total Work Load			**126**
ECTS Credit of the Course			**4**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P04	P05	P08	P09	P10	P12
All	5					3		5
C01					3			
C02		5					2	
C03			4					
C04				4				

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4036	Thermo-Chemical Processes				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4036	Thermo-Chemical Processes	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
¦ Develop rules for determining non-reacting gas mixture properties from the knowledge of mixture composition and the properties of the individual components. ¦ Apply energy balances to reacting systems for both steady-flow control volumes and fixed-mass systems. ¦ Develop the equilibrium criterion for reacting systems based on the second law of thermodynamics. ¦ Apply the Gibbs phase rule to determine the number of independent variables associated with a multicomponent, multiphase system.
Teaching Methods and Techniques:
Laws of Thermodynamics; Equilibrium and stability; Thermodynamic properties of mixture; Chemical reactions; Chemical and phase equilibrium
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:

Assistants:
Dr. Abdulrazzak AKROOT

Recommended or Required Reading

Resources Koretsky, M. D.; Engineering and Chemical Thermodynamics, John Wiley and Sons, New Delhi (2004).,M. Smith, H. C. Van Ness and M. M. Abbott; Introduction to Chemic

Course Category

Mathmatics and Basic Sciences	:	40	**Education**	:	
Engineering	:	60	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Review of the First and Second Laws of Thermodynamics		
2	Equilibrium and stability in one-component systems		
3	Thermodynamics properties of multicomponent mixtures		
4	Estimation of Gibbs energy and fugacity of components in mixtures (including activity coefficient models)		
5	P-v-T Behavior of Gas Mixtures: Ideal and RealGases		
6	Multiphase equilibrium in mixtures (vapor-liquid, liquid-liquid, vapor-liquidliquid)		
7	Theoretical and Actual Combustion Processes		
8	Enthalpy of Formation and Enthalpy of Combustion		
9	First-Law Analysis of Reacting Systems		
10	Second-Law Analysis of Reacting Systems		
11	Criterion for Chemical Equilibrium		
12	The Equilibrium Constant for Ideal-Gas Mixtures		
13	Chemical Equilibrium for Simultaneous Reactions		
14	Variation of Equilibrium constant with Temperature, Phase Equilibrium		

Course Learning Outcomes

No	Learning Outcomes
C01	Determine the equilibrium composition for a reacting system given the reaction stoichiometry, temperature, and pressure.
C02	Establish the phase equilibrium for non-reacting systems in terms of the specific Gibbs function of a pure substance's phases.
C03	Apply the Gibbs phase rule to determine the number of independent variables associated with a multi-component, multiphase system.
C04	Determine the adiabatic flame temperature for reacting mixtures and Evaluate the entropy change of reacting systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	2	28
Hours for off-the-c.r.stud	6	1	6
Assignments	1	6	6
Presentation	0	0	0
Mid-terms	1	5	5
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	7	7
Total Work Load			**52**
ECTS Credit of the Course			**2**

Contribution of Learning Outcomes to Programme Outcomes

	P01
C01	5
C02	5
C03	5
C04	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4055	Transport Techniques				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4055	Transport Techniques	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Main purpose of the course students, giving knowledge abaut lifting and moving machinery-related topics in basic engineering design projects.
Teaching Methods and Techniques:
Lifting and handling machinery elements; load related components, drive components, motors and gearboxes between loads. Pulleys and pulley systems, drums. Stop and load holding brakes, lock gears. wheels and rails. Feeders and belt, chain, vibratory, endless screw conveyors. Pneumatic conveying systems. Design projects.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Dr. Recep Demirsöz
Assistants:

Recommended or Required Reading

Resources	Transport Tekniği, Kaldırma ve Taşıma Makinaları,İstanbul 1999, Prof.Dr. Hamit ÖZTEPE

Course Category

Mathmatics and Basic Sciences	:	30	**Education**	:	
Engineering	:	70	**Science**	:	
Engineering Design	:		**Health**	:	
Social Sciences	:		**Field**	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Material handling systems and classification.		
2	Wire ropes and chains.		
3	Wire rope and chain pulleys and pulleys sets.		
4	Hooks, hooks beds and sleepers.		
5	Wire rope and chain drums.		
6	The accounts of hoisting system (Design Project).		
7	Brakes and brake rleasers.		
8	Brakes and brake torque account.		
9	Locks, wheels and rails.		
10	Kilitler, tekerlekler ve raylar.		
11	Locks, wheels and rails.		
12	The design of belt conveyors.		
13	The design of belt conveyors.		
14	The design of belt conveyors.		

Course Learning Outcomes

No	Learning Outcomes
C01	General Knowledge about Transport Machines.
C02	Designing capability for transporting and lifting machines.
C03	Learning Transport Systems Projects.
C04	Ability to calculate Transport Systems unknowns and analysing.
C05	Learning maintanence and repair of transport systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%24
Quizzes	0	%0
Assignment	1	%16
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	3	42
Hours for off-the-c.r.stud	12	4	48
Assignments	1	20	20
Presentation	0	0	0
Mid-terms	1	16	16
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	16	16
Total Work Load			**142**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P06	P09	P10
C01	3	4	3	2	4
C02	3	4	3	2	4
C03	3	4	3	2	4
C04	3	4	3	2	4
C05	3	4	3	2	4

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4024	Vehicle Dynamics and Control				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4024	Vehicle Dynamics and Control	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
Purpose of this course is to advance knowledge the students about vehicle mechanics and to calculate and analysis forces acting on a vehicle
Teaching Methods and Techniques:
Forces acting on a vehicle, resistances, tractive force, adhesion force and slide net tractive force, Sideways sliding in cornering, steering, vehicle suspension system Definition of vibration and its types, vibrations affecting engines.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Asist Prof.Dr. Mustafa KARAGÖZ
Assistants:

Recommended or Required Reading

Resources	Prof.Dr. Selim ÇETİNKAYA, "", 2010

Course Category

Mathmatics and Basic Sciences	:	0	**Education**	:	0
Engineering	:	0	**Science**	:	0
Engineering Design	:		**Health**	:	0
Social Sciences	:	0	**Field**	:	0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	History of vehicles		
2	Vehicle performance		
3	Engine performance		
4	Clutches		
5	Transmissions		
6	Differential and axles		
7	Tires, types, lateral forces		
8	Vehicle aerodynamics, air resistance		
9	Hill and acceleration resistance		
10	Forces acting on a vehicle while driving		
11	Forces acting on a vehicle while driving		
12	Forces acting on a vehicle during braking, stopping distance, passes		
13	Braking performance analysis and calculations		
14	Suspension, bend upset		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Students attended this course are able to analyse and vehicle mechanic subjects and design vehicle

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	4	56
Hours for off-the-c.r.stud	1	6	6
Assignments	1	3	3
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	10	10
Total Work Load			**83**
ECTS Credit of the Course			**3**

Contribution of Learning Outcomes to Programme Outcomes

	P02	P04	P09	P10
C01	1	1	5	5

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE4030	Vehicle Technologies				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE4030	Vehicle Technologies	3	3	5

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The purposes of this course are to; introduce the vehicle systems to students and earn the required calculation ability for vehicle systems design.
Teaching Methods and Techniques:
Classification of vehicles. Engine characteristics. Powertrain. Wheel and tire mechanics. Rolling resistance. Vehicle aerodynamics. Weather resistance. Slope and acceleration resistances. Brake systems. Suspension system. Chassis and bodywork. Steering system.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. M. Bahattin Çelik
Assistants:

Recommended or Required Reading

Resources Pulkrabek, W.W., "Engineering undamentals of Internal Combustion Engines" , Dorling Kindersley (india) Pvt Ltd.,Wong,J.Y. "Theory of Ground Vehicles", John Wiley & Sc

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	
Engineering	:	30	**Science**	:	10
Engineering Design	:	10	**Health**	:	
Social Sciences	:		**Field**	:	40

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Classification of vehicles.		
2	Engine characteristics. Speed and load characteristics.		
3	Power transmission systems. Clutches.		
4	Transmissions. Working principles of transmission. Classification of transmissions.		
5	Cardan shaft. Differantial and axle shaft.		
6	Mechanics of the wheel and tire.		
7	Rolling resistance and its calculating.		
8	Vehicle aerodynamics. Aerodynamic forces.		
9	Air resistance and its calculating.		
10	Gradient and inertia resistances.		
11	Brake systems. Anti-Block brake system.		
12	Suspension system and its components.		
13	Chassis and car body.		
14	Steering systems and its working principles.		

Course Learning Outcomes

No	Learning Outcomes
C01	The student who takes this course classifies the vehicles.
C02	evaluates the engine performance characteristics.
C03	computes the vehicle resistances and performance parameters.
C04	explains the power transmission system.
C05	defines the brake, suspension and steering systems.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	0	0
Hours for off-the-c.r.stud	14	5	70
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	3	3
Practice	0	0	0
Laboratory	5	10	50
Project	0	0	0
Final examination	1	3	3
Total Work Load			**126**
ECTS Credit of the Course			**5**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
C01	2		4	2	3	1	2	3	4	1	3	2
C02		3	2	4				1				4
C03	3	2			1	5	2		5	3	2	
C04			3	2				2	1	4	5	3
C05	1	1			4	3	1					

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE423	Workplace Practice				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
7	MEE423	Workplace Practice	15	7	20

Mode of Delivery:
Face to Face
Language of Instruction:
English (%100)
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Elective
Objectives of the Course:
The aim of this course is to prepare students to internship.
Teaching Methods and Techniques:
to be able to practice in the workplace and express what they learn in writing and verbally
Prerequisites and co-requisities:

Course Coordinator:
Prof.Dr. Emrah Deniz
Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Instructor Lecture Notes

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	10
Engineering	:	20	**Science**	:	10
Engineering Design	:	10	**Health**	:	10
Social Sciences	:	20	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Training to meet and work with		
2	Workplace training		
3	Workplace training		
4	Workplace training		
5	Workplace training		
6	Internship report writing		
7	technical visits		
8	midterm		
9	Internship applications		
10	Internship applications		
11	Internship applications		
12	Internship applications		
13	Internship applications		
14	Internship applications		
15	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	To make preparations for internship.
C02	To learn main professional concepts.
C03	To control students about their internship responsibilities.
C04	To learn to make team work during internship.
C05	To make internship process more effective by make to use all theoretical and practical knowledge of student.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	0	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	15	210
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	45	45
Practice	14	15	210
Laboratory	0	0	0
Project	0	0	0
Final examination	1	45	45
Total Work Load			**510**
ECTS Credit of the Course			**17**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12
All	2	3	3	4	3	4	3	3	5	3	3	5
C01	2	3	3	4	3	4	3	3	5	3	3	5
C02	2	3	3	4	3	4	3	3	5	3	3	5
C03	2	3	3	4	3	4	3	3	5	3	3	5
C04	2	3	3	5	3	5	3	3	5	3	3	5
C05	2	3	3	5	3	5	3	3	5	5	5	5

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Karabük University

Faculty of Engineering
Mechanical Engineering

MEE406	Graduation Project				
Semester	**Course Unit Code**	**Course Unit Title**	**L+P**	**Credit**	**Number of ECTS Credits**
8	MEE406	Graduation Project	2	1	5

Mode of Delivery:
Face to Face
Language of Instruction:
Turkish
Level of Course Unit:
Bachelor's Degree
Work Placement(s):
No
Department / Program:
Mechanical Engineering
Type of Course Unit:
Required
Objectives of the Course:
To be able to complete a project in the field of mechanical engineering with all steps from beginning to end.
Teaching Methods and Techniques:
Selection of the project topic, Literature review on the subject of the project.
Prerequisites and co-requisities:

Course Coordinator:

Name of Lecturers:
Prof.Dr. Emrah DENİZ
Assistants:

Recommended or Required Reading

Resources Scientific articles.

Course Category

Mathmatics and Basic Sciences	:	10	**Education**	:	10
Engineering	:	10	**Science**	:	30
Engineering Design	:	10	**Health**	:	10
Social Sciences	:	10	**Field**	:	10

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Graduation Project.		
2	Graduation Project.		
3	Graduation Project.		
4	Graduation Project.		
5	Graduation Project.		
6	Graduation Project.		
7	Graduation Project.		
8	Graduation Project.		
9	Graduation Project.		
10	Graduation Project.		
11	Graduation Project.		
12	Graduation Project.		
13	Graduation Project.		
14	Graduation Project.		

Course Learning Outcomes

No	Learning Outcomes
C01	Describe the problems in mechanical engineering.
C02	Project the identified problem.
C03	Can carry out laboratory applications alone.
C04	Evaluate and analyze the data.
C05	Can write project report.

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria

In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	1	%10
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		**%100**

ECTS Allocated Based on Student Workload

Activities	Quantity	Duration	Total Work Load
Course Duration	14	1	14
Hours for off-the-c.r.stud	12	14	168
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	14	14
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	14	14
Total Work Load			**210**
ECTS Credit of the Course			**7**

Contribution of Learning Outcomes to Programme Outcomes

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11
All	5	5	5	5	5	5	5	5	5	5	5

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
P09	Recognize the importance of professional and ethical responsibility.
P12	Collect and classify the data in the applications of mechanical engineering
P04	Use the techniques, skills, and modern engineering tools necessary for mechanical engineering practice.
P01	Apply theoretical and practical knowledge of mathematics, science, and engineering to mechanical engineering.
P05	Design and conduct experiments individually or in groups, as well as analyze and interpret data for mechanical engineering problems.
P03	Design a machine based system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufactural
P02	Identify and solve complex mechanical engineering problems.
P08	Recognize the need for lifelong learning and follow up developments in mechanical field.
P07	Communicate effectively in oral and written forms with a good command of at least one foreign language, preferably English.
P06	Work effectively in multidisciplinary teams to accomplish a common goal.

Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
P10	Appreciate the need for knowledge of contemporary issues.
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Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes

Program Learning Outcomes

No	Learning Outcome
P11	Assess the impact of mechanical engineering solutions in a global, economic, environmental, and societal context.
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Assessment Methods and Criteria		
In-Term Studies	**Quantity**	**Percentage**
Mid-terms	0	%0
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	0	%0
Total		**%0**

ECTS Allocated Based on Student Workload			
Activities	**Quantity**	**Duration**	**Total Work Load**
Course Duration	0	0	0
Hours for off-the-c.r.stud	0	0	0
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	0	0	0
Total Work Load			**0**
ECTS Credit of the Course			**0**

Contribution of Learning Outcomes to Programme Outcomes