



Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 Simulink 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-requisites:**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

Mathematics 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.

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
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Instructor Akile BAŞARI Instructor Nihal TOPCU Instructor Büşra ŞANLI Instructor Duygu YAZICI AŞÇI Instructor Fatma Zehra KÖK

Recommended or Required Reading**Resources**

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

Course Category			
Mathematics 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 Tirr		
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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof. Dr. MUSTAFA ER

Assistants:**Recommended or Required Reading****Resources** Turkish, Book, Petrucci-Harwood-Ringa, General Chemistry, Palme Publishing, Ankara, English, Book, Prof. Dr. Prof. Dr. Ender Erdik Dr. Yüksel Sankaya Basic University C**Course Category**

Mathematics and Basic Sciences	: 80	Education	:
Engineering	: 20	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	Stoichiometry: Chemical calculations		
6	Stoichiometry: 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.

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	1	12
Assignments	1	10	10
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	14	1	14
Project	0	0	0
Final examination	1	22	22
Total Work Load			100
ECTS Credit of the Course			3

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof. Dr. İsmail ATILGAN

Assistants:**Recommended or Required Reading****Resources**

Physics for Scientists and Engineers, Raymond Serway-Robert Beichner, BROOKS/COLE CENGAGE Learning, (2010). ,University Physics with Modern Physics, H.D. Young
 1. Physics for Scientists and Engineers, Raymond Serway-Robert Beichner, BROOKS/COLE CENGAGE Learning, (2010).

Course Category

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
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	Applications of Newton's law		
7	Applications of Newton's law		
8	Work and kinetic energy		
9	Potential energy		
10	Conservation of energy		

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.

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	0	0	0
Final examination	1	15	15
Total Work Load			143
ECTS Credit of the Course			5

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN101 Introduction To Railway Systems Engineering					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
1	REN101	Introduction To Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

An introduction for all systems engineering profession

Teaching Methods and Techniques:

Introducing the first year undergraduate students rail systems engineering concepts, definitions, symbols, and units.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Mehmet Emin AKAY

Assistants:**Recommended or Required Reading**

Resources Makine Mühendisliğine Giriş, Fatih C. Babalık, Kadir Çavdar, Dora Yayıncılık, 2015

Course Category

Mathematics and Basic Sciences	: 30	Education	:
Engineering	: 40	Science	: 10
Engineering Design	: 10	Health	:
Social Sciences	:	Field	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Mühendislik disiplinleri.		
2	Rail systems and railway systems engineering		
3	Uluslararası ve İngiliz birim sistemleri.		
4	Kuvvet, enerji, iş, güç tanımları.		
5	Potansiyel enerji, kinetik enerji, mekanik enerji.		
6	Bir şekilden başka bir şekle enerji dönüşümü (?dev teslim).		
7	Enerji dönüşümü ile ilgili örnekler.		
8	Moment, kuvvetler dengesi ve statik denge.		
9	Enerji korunumu prensibi (Termodinamik 1. kanunu).		
10	train wagon locomotive		
11	rail systems drive elements		
12	railway management		
13	rail system components		

Course Learning Outcomes

No	Learning Outcomes
C01	Mühendislik disiplinlerini tanıyabilecekler
C02	Meslek olarak Makine Mühendisliği'ne değer verebilecekler
C03	İş pazarı, mühendislik disiplinleri arası olanakları tanımlayabilecekler
C04	Kuvvet, enerji, iş, güç ifadelerini açıklayabilecekler
C05	Küçük mekanik aletleri tasarlayabilecekler
C06	Sunum yeteneğini yönetebilecekler

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	2	28
Hours for off-the-c.r.stud	12	4	48
Assignments	10	1	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	12	12
Total Work Load			106
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Instructor Emrullah DemiralDr. Burhan SelçukDr. Hakan Kutucu

Assistants:**Recommended or Required Reading****Resources**

- Genel Matematik I, Balçı Yayınları, 2008., Thomas' Calculus, Addison-Wesley, 2005., Analize Giriş I(2.Baskı), Grafiker Yayınları, 2007., Genel Matematik, 3. Baskı, Nobel Yayıncılık, 2009.
1. Genel Matematik I, Balçı 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

Mathematics 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, composition 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 sequences 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.

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			5

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. ULAŞ MATİK

Assistants:**Recommended or Required Reading**

Resources Turkish, Book, Basic Technical Drawing, 2013.,Turkish, Book, Modular Teaching System Application Technical Drawing,, 1995.

Course Category

Mathematics 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	Tools and equipments used in technical drawing and standard writing.		
2	Types of lines, geometrical drawing related to lines and angles, polygonal drawings.		
3	"Çember ve teğet doğrularla ilgili çizimler		
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	Norm can write.
C02	It can make three views of an object.
C03	Draw a perspective view from the appearance of objects.
C04	Can show the details of the objects by using the sectioning rules.

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	12	2	24
Assignments	1	10	10
Presentation	0	0	0
Mid-terms	1	12	12
Practice	0	0	0
Laboratory	14	2	28
Project	0	0	0
Final examination	1	15	15
Total Work Load			117
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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, Univ
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

Mathematics 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	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.

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



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
Railway Systems 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:

Railway Systems 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, preparation 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, evolverment, 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, text, filleting, chamfering, extending, stretching, making block, replacing block, forming table and letterhead, calculating distance and area, view and zooming commands.

Prerequisites and co-requisites:**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

Mathematics 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, text.		
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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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 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

Mathematics 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 file operations
C05	Use pointers and arrays

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Instructor Akile BAŞARIInstructor Nihal TOPCUInstructor Büşra ŞANLIInstructor Duygu YAZICI AŞÇIInstructor Fatma Zehra KÖK

Recommended or Required Reading**Resources**

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

Course Category			
Mathematics 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 Adjectives	Reading & Listening:The Colou
2	Grammar:Comparative Adjectives & Superlative AdjectivesAs asVocabulary:Parts of the BodyParts of the Face	Reading
3	Grammar:Countable Nouns &Uncountable NounsQuantifiers	Vocabulary:Vegetables and Fruit	Reading & Listening:Ordering
4	Grammar:Present Perfect Tense & Been & Gone	Vocabulary:Yet, Already, Just, Ever, Never	Reading & Listening:Going to the
5	Grammar:Present Perfect Tense Compared with Simple Past Tense	Vocabulary:Since, For, Ago	Reading & Listening:The Old
6	Grammar:Modals: Can/ Can't & Could/ Couldn't & Should/ Shouldn't	Vocabulary:Health and Illnesses	Reading & Listening:.
7	Grammar:Modals: Must/ Mustn't Have to /Has to Don't have to/ Doesn't have to	Had to	Vocabulary:Cl
8	MIDTERM EXAM		
9	Grammar:Future Tense (Will/ Be Going to)	Vocabulary:Common Phrasal Verbs	Reading & Listening: The Weekend
10	Grammar:Conditionals: Zero Conditional (Type 0)First Conditional (Type 1) Second Conditional (Type 2)	Vocabulary:Rooms	
11	Grammar:Gerunds & Infinitives	Vocabulary:Verb + PrepositionsAdjective + Prepositions	Reading & Listening: Stop Wasting 1
12	Grammar:Passive Voice	Vocabulary:Participle Adjectives (-ing/-ed Adjectives)	Reading & Listening:Organising Your Time
13	Grammar:Relative Clauses (Adjective Clauses)	Vocabulary:Expressions with Do and Make	Reading & Listening:My Favourite
14	Grammar:Tag Questions	Vocabulary:Clothes	Reading & Listening:Online Safety Conversation
15	Grammar:Too/ Either & So/ Neither	Vocabulary:Feelings and Emotions	Reading & 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. AHMET MUSTAFA ERER

Assistants:**Recommended or Required Reading****Resources** Physics for Scientists and Engineers, Raymond Serway-Robert Beichner, BROOKS/COLE CENGAGE Learning, (2010).,University Physics with Modern Physics, H.D. Young v**Course Category**

Mathematics and Basic Sciences	: 35	Education	:
Engineering	: 30	Science	: 35
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.

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	3	42
Hours for off-the-c.r.stud	12	2	24
Assignments	1	8	8
Presentation	0	0	0
Mid-terms	1	14	14
Practice	0	0	0
Laboratory	14	1	14
Project	0	0	0
Final examination	1	15	15
Total Work Load			117
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Asist Prof.Dr. Mukaddes ÖKTEN TURACI Instructor Ahmet Zahid KÜÇÜK Asist Prof.Dr. Ebru Ergün HÜSEYİN Prof.Dr. Hüseyin KURT Undefined İsmail BIYIKLI

Recommended or Required Reading**Resources** 1. A. O. Morris, "Linear Algebra an Introduction", Chapman&Hall, London, 1982
 2. Seymour Lipschutz, "Theory and Problems of Linear Algebra", 2nd Ed., Schaum's Outli**Course Category**

Mathematics and Basic Sciences	: 100	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	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	Mid-Term Exam		
10	Linear Transformations		
11	Matrix Representation of Linear Transformations		
12	Eigenvalues and Eigenvectors		
13	Diagonalization		
14	Inner Product Spaces-I		
15	Inner Product Spaces-II		
16	Final Exam		
17	Final Exam		

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.

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	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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 Indefinite 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. MEHMET KAZIM YETİK

Assistants:**Recommended or Required Reading****Resources** Turkish, Book, General Mathematics I, Balci Publications, 2008.,English, Book, Thomas, Mathematics, Addison-Wesley, 2005.,Turkish, Book, Introduction to Analysis I (2n**Course Category**

Mathematics and Basic Sciences	: 50	Education	:
Engineering	: 35	Science	:
Engineering Design	: 15	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.

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	1	10	10
Presentation	0	0	0
Mid-terms	0	0	0
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	15	15
Total Work Load			129
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Özden İŞBİLİR Dr. Mehmet Bakırcı

Assistants:**Recommended or Required Reading****Resources**

Vector Mechanics for Engineers, Statics, 9th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., David Mazurek, Eliot R. Eisenberg; McGraw Hill, 2010. Engineering Mechanics, Engineering Mechanics, Statics, 12th Edition; R.C. Hibbeler, Prentice Hall Pearson Education, 2010.
Vector Mechanics for Engineers, Statics, 9th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., David Mazurek, Eliot R. Eisenberg; McGraw Hill, 2010.
Engineering Mechanics, Statics, 6th Edition, J.L. Meriam, L.G. Kraige, Wiley, 2008.

Course Category

Mathematics 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: fundamental 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 examination		
7	FORCE SYSTEM RESULTANTS: Moment of a couple, resultant force and couple system. (Assignment will be given for collection)		
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, manufacturing
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

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			3

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Instructor Yılmaz BACAĞLIAsist Prof.Dr. Nimet KARA KÜTÜKÇÜAsist Prof.Dr. Serhat KÜÇÜKInstructor Ali YILMAZAsist Prof.Dr. Ahmet ÖKSÜZAsist Prof.Dr. Recep TEK

Recommended or Required Reading**Resources**

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

Course Category

Mathematics 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	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	Midterm Exam		
9	Composition.		
10	Types of Expression.		
11	Brainstorming.		
12	Types of Written Expression.		
13	Types of Oral Expression.		
14	Types of Templates.		
15	Methods of Research Article Writing.		
16	Final Exam		
17	Final Exam		

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.

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	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



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

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Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Instructor Fatma ERTENInstructor Hamza ÜZÜMCÜAsist ProfDr. Ersin MÜEZZİNOĞLUAssociate Prof.Dr. Barış SARIKÖSEInstructor Levent DAĞAsist Prof.Dr. Cemile ŞAHİN

Recommended or Required Reading**Resources**

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

Course Category

Mathematics 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	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 centuries).		
3	The Sources of Turkish revolution (External Causes of the Collapse of the Ottoman Empire(XVII and XIX centuries).		
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 Establishment of İttihat Terakki (Committee of Union and Progr		
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: Paris 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 minority and Armenians, Capit		
13	The Treaty of Lausanne and its Significance, Articles of the Treaty.		
14	Overview of National Struggle Era.		
15	Midterm Exam is given between the 7th and 15th weeks.		
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.

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	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





Karabük University

Faculty of Engineering
Railway Systems Engineering

MEE215 Differential Equations					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
3	MEE215	Differential 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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

The main aims of this course are provide the student general knowledge about the usage of natural language of mathematics as a toll for modeling, formulating and solving of engineering problems.

Teaching Methods and Techniques:

Classification of differential equations, obtaining of differential equations, first order differential equations, higher order linear differential equations, Laplace transform.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Prof.Dr. Ahmet DEMİR

Recommended or Required Reading**Resources**

Adi Diferansiyel Denklemler Prof.Dr. Mehmet Çağlıyan, Yrd.Doç.Dr.Nisa Çelik,Yrd.Doç.Dr. Setenay Doğan,Difansiyel Denklemler, Schaum s Outlines, Differential Equations

Course Category

Mathematics and Basic Sciences	: 100	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	Forming of Differential Equations. Classification of Differential Equations. (Homework,Received date of homework : 9. weel		
2	First Order and First Degree Differential Equations. Separable Equations. Equations Reducible to the Separable Case.		
3	Homogeneous Equations, Equations Reducible to the Homogeneous Case.		
4	First Order Linear Equations. The Bernoulli Equation.		
5	Exact Differential Equations. Equations Reducible to the Exact Equation Case.		
6	The Integrating Factor.		
7	The Riccati Equation.		
8	The Clairauf Equation. The Lagrange Equation.		
9	Higher Order Linear Equations. Solution of Nonhomogeneous Equations with Constant Coefficients.		
10	The Method of Undetermined Coefficients for Solution of Nonhomogeneous Equations with Constant Coefficients.		
11	The Inverse Image Method for Solution of Nonhomogeneous Equations with Constant Coefficients.		
12	Factoring of the Operator for Linear Equations with Variable Coefficients.		
13	Reducing the Order of Linear Equations with Variable Coefficients, The Method of Variation of Parameters.		
14	The Cauchy-Euler Equation.		
15	Midterm exam is given between 7th and 15th weeks.		
16	Final exam.		
17	Final exam.		
50	Forming of Differential Equations. Classification of Differential Equations. (Homework,Received date of homework : 9. weel		
51	Final exam.		
52	Final exam.		
53	Midterm exam is given between 7th and 15th weeks.		
54	The Cauchy-Euler Equation.		
55	Reducing the Order of Linear Equations with Variable Coefficients, The Method of Variation of Parameters.		
56	Factoring of the Operator for Linear Equations with Variable Coefficients.		
57	The Inverse Image Method for Solution of Nonhomogeneous Equations with Constant Coefficients.		
58	The Method of Undetermined Coefficients for Solution of Nonhomogeneous Equations with Constant Coefficients.		
59	Higher Order Linear Equations. Solution of Nonhomogeneous Equations with Constant Coefficients.		
60	The Clairauf Equation. The Lagrange Equation.		
61	The Riccati Equation.		
224827	First Order and First Degree Differential Equations. Separable Equations. Equations Reducible to the Separable Case.		
224829	Homogeneous Equations, Equations Reducible to the Homogeneous Case.		
224831	First Order Linear Equations. The Bernoulli Equation.		
224833	Exact Differential Equations. Equations Reducible to the Exact Equation Case.		
224835	The Integrating Factor.		

Course Learning Outcomes

No	Learning Outcomes
C01	Use mathematics as a language of the nature for modelling.
C02	Identify and solve physical events and engineering problems.
C03	Establish relationship between mathematics and other sciences.
C04	İkinci basamaktan değişken katsayılı lineer diferansiyel denklemleri çözer.
C05	Yüksek basamaktan sabit katsayılı denklemleri çözer.
C06	Laplace dönüşümü yardımıyla diferansiyel denklemleri çözer.

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	2	8	16
Presentation	0	0	0
Mid-terms	1	7	7
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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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

Mathematics 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

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	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





Karabük University

Faculty of Engineering
Railway Systems Engineering

MEE205 Materials Science					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
3	MEE205	Materials Science	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:

Railway Systems 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, Bravais lattice and crystal systems, Crystal defects, 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Harun ÇuğDr. Ahmet Emrah ErdoğanProf. Dr. Bilge Demir

Assistants:**Recommended or Required Reading**

Resources Foundations of Materials Science and Engineering, William F. Smith , Javad Hashemi, Materials Science and Engineering, William D. Callister, David D. Rethwisch, Translati

Course Category

Mathematics and Basic Sciences	: 50	Education	: 0
Engineering	: 50	Science	: 0
Engineering Design	: 0	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, Hexagonal tight packings		
3	Bravais lattice 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-Fe ₃ C 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.

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	2	24
Assignments	0	0	0
Presentation	0	0	0
Mid-terms	1	8	8
Practice	14	1	14
Laboratory	0	0	0
Project	0	0	0
Final examination	1	12	12
Total Work Load			100
ECTS Credit of the Course			3

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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

Mathematics 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

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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Required

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-requisites:**Course Coordinator:**

Dr. Özden İŞBİLİR

Name of Lecturers:

Dr. Özden İŞBİLİR

Assistants:**Recommended or Required Reading****Resources**

Mechanics of Materials, 6th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., John T. Dewolf, David F. Mazurek, McGraw-Hill, 2012, ISBN 978-0-07-338028-5, Mechanics Cismilerin Mukavemeti, 6. Basımdan Çeviri, Ferdinand P. Beer, E. Russell Johnston Jr., John T. Dewolf, David F. Mazurek, Çevirenler: Ayşe Soyuçuk, Özgün Soyuçuk, Liter

Course Category

Mathematics 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 Structure		
2	Introduction and Concept of Stress- Application to the analysis and design of simple structures- Stress on an oblique plane-		
3	Stress and Deformation Under Axial Loading- Normal strain under axial loading- Engineering stress-strain diagram- True stress		
4	Stress and Deformation Under Axial Loading- Deformation under axial loading- Statically indeterminate cases- Thermal stress		
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 for Bending- Shear and bending moment diagrams- Relations among diagrams		
14	Analysis and Design of Beams for Bending- 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

Learning engineering terminology in english, developing text comprehension, writing, reading and listening skills.

Teaching Methods and Techniques:

The Concept and Basic definitions of science, technology, engineering, engineer. History of engineering. The methodology of engineering work The concept and steps of scientific method. The concept and steps of engineering design process. Problem solving techniques in engineering. Seven steps to problem solving in engineering.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Asist Prof.Dr. Okan ÜNALInstructor Mehmet AKKAŞAssociate Prof.Dr. Hasan YILDIRIMAsist Prof.Dr. Murat TEKELİOĞLU

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

Mathematics 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	The concept and basic definitions of science, technology, engineering, engineer		
2	History of engineering		
3	Basic methodologies in engineering work		
4	The concept and steps of scientific method		
5	The concept and steps of engineering design process		
6	Problem solving techniques in engineering		
7	Seven steps to problem solving in engineering		
8	Seven steps to problem solving in engineering		
9	Fields of engineering (Aerospace Engineering,Biological Engineering, Civil Engineering)		
10	Fields of engineering (Computer Engineering,Electrical Engineering, Engineering Science)		
11	Fields of engineering (Financial Engineering,Industrial Engineering, Material Engineering)		
12	Fields of engineering (Mechanical Engineering,Military Engineering, Nuclear Engineering)		
13	Fields of engineering (Ocean Engineering,Petroleum Engineering, Reverse Engineering)		
14	Fields of engineering (Geoengineering,Textile Engineering, Safety Engineering)		
15	Midterm exam is done between 7th and 15th weeks.		
16	Final Exam		
17	Final Exam		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will have knowledge about engineering concepts, fields of engineering, technical aspects of them in English language. Their writing, reading and listening skills are also improved.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:

None

Course Coordinator:

None

Name of Lecturers:

Prof. Dr. Kamil Arslan Dr. Erhan Kayabaşı Dr. Enes Kılıç Dr. Abdulrazzak Akroot

Assistants:

None

Recommended or Required Reading**Resources**

Y.A. Çengel, M.A. Boles, Thermodynamics: an Engineering Approach 8th Edition, 2015., Michael J. Moran, Howard N. Shapiro, Daisie D. Boettner, Margaret B. Bailey, "Fundamentals of Thermodynamics", 5th ed, McGraw-Hill, 2006.

Course Category

Mathematics and Basic Sciences	:	70	Education	:	
Engineering	:	30	Science	:	
Engineering Design	:		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 substances		
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.

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



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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

This course provides the Turkish youth with consciousness about Atatürk'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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Prof. Dr. Nurgün KOÇ Instructor Yunus GÖK Instructor Mustafa KARACA Instructor Fatma ERTEN Instructor Hamza ÜZÜMCÜ Instructor Yusuf TEKE

Recommended or Required Reading**Resources**

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

Course Category

Mathematics 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	Revolutions in the field of political: Abolition of the Ottoman Sultanate; Proclamation of the Republic; Abolition of the Caliph		
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 entrance		
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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

MEE216 Basics Of Electricity and Electronics					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
4	MEE216	Basics Of Electricity 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof. Dr. M. Bahattin Çelik

Assistants:**Recommended or Required Reading**

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

Course Category

Mathematics 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	Studying on various circuit	-	-

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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN210 Manufacturing Processes I					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
4	REN210	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:

Railway Systems 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-requisites:

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 Jersey: John Wiley & Sons, (2003), Kalpakjian, S., Schmid, S.R.

Course Category

Mathematics 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, t		
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

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Ahmet Emrah Erdoğan

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

Mathematics 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, torque and power measurement techniques.
C03	Analyze the experimental data.
C04	compute the uncertainty analysis for experimental studies.
C05	report the experimental results.

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			3

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 divided differences tables, 5.Solving interpolation problems, 6.Solving derivation and integration problems with numerical analysis methods

Teaching Methods and Techniques:

The representation of number in computer system. Error concept, Taylor and Mclaren Series, Convergency methods to nonlinear equation system Linear equation systems, Divided difference, interpolation, Backward interpolation, Numerical derivative, Numerical integration, Euler, Taylor ve Runge-Kutta methods.

Prerequisites and co-requisites:

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

Mathematics 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	Midterm 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:

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. Cornwell, 2012, ISBN 978-0-07-338028-5, Mechanics of Materials, 6th Edition, Ferdinand P. Beer, E. Russell Johnston Jr., John T. Dewolf, David F. Mazurek, McGraw-Hill, 2012, ISBN 978-0-07-338028-5

Course Category

Mathematics 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 the horizontal face of a beam		
2	Shear Stresses in Beams and Thin-Walled Members- Longitudinal shear force on a beam with arbitrary shape- Shearing stress on the horizontal face of a beam		
3	Transformations of Stress and Strain- Transformation of plane stress- Principal stresses, maximum shearing stress- Mohr's circle		
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 indeterminate beams		
10	Deflection of Beams- Moment-area theorems - Bending-moment diagrams by parts- Use of moment-area theorems with statically indeterminate beams		
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 Eccentric Load		
13	Energy Methods- Strain energy- Elastic strain energy for normal stresses- Elastic strain energy for shear stresses- Strain energy for bending		
14	Energy Methods- Impact loading- Calculation of deflection using work and energy method- Calculation of deflection using Castigliano's method		

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.

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	





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 technology. 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Associate Prof.Dr. Sakine Uğurlu KARAAĞAÇAsist Prof.Dr. Okan ÜNALInstructor Mehmet AKKAŞAsist Prof.Dr. Murat TEKELİOĞLU

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			
Mathematics 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 hydraulic 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	The lecture enables not only learn different occupational terms but also develop presentation skills by learning technological development with literature searching Besides this, this lecture is to be a guide for work life and working area of students.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Erhan Kayabaşı/Prof.Dr. Kamil Arslan/Dr. Enes Kılıç/Dr. 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**

Mathematics 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.

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



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
Railway Systems 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:

Railway Systems 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-requisites:**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

Mathematics 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	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	OrqütseI davranış teorileri yardımcı ile insan davranışları ile organizasyon arasında ilişki kurar.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 software programme to learn how to draw an architectural drawing or any other 2 and 3 dimensional drawings.

Prerequisites and co-requisites:**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

Mathematics 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

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
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Undefined Dekanlık

Assistants:**Recommended or Required Reading****Resources** Elder L., Richard P., "", 2003**Course Category**

Mathematics 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	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 Sinavi Final exam		
17	Final exam		

Course Learning Outcomes

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

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN315 Engines and Power Trains					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
5	REN315	Engines and Power Trains	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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

The aim of this course is to introduce the structure, operation and design of power transmission organs and to teach the analysis and calculations of forces in power transmission organs.

Teaching Methods and Techniques:

Occupational safety and security measures, vehicle regulations, clutches, gearboxes, flexible joints and cardan shafts, axles and differentials, tires and wheels, steering system, brake system, suspension system.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Associate Prof.Dr. Mehmet ÇELİK

Assistants:**Recommended or Required Reading**

Resources Power train.
Güç Aktarma Organları MEB Yayınları

Course Category

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

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Occupational safety and security measures.		
2	vehicle regulations.		
3	clutches.		
4	Transmission		
5	Transmission		
6	Transmission		
7	Flexible joints and cardan shafts.		
8	Mid-term		
9	Axle and differentials.		
10	tire and wheels.		
11	steering system.		
12	brake system.		
13	suspension system.		
14	suspension system.		
15	Final exam		

Recommended Optional Programme Components

MEE4055 Transport Techniques

Course Learning Outcomes

No	Learning Outcomes
C01	Learns the structure of powertrain.
C02	Learns the operation and design of powertrain.

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	30	30
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	50	50
Total Work Load			100
ECTS Credit of the Course			3

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Prof. Dr. Refik POLAT

Recommended or Required Reading

Resources Çetindamar, Dilek, (2002) Türkiye'de Girişimcilik, TÜSİAD Yayınları(Yayın No:TÜSİAD-T/2002-12/340,

Course Category

Mathematics 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	Description of 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 Entrepreneurship.		
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 planning and product planning in the business plane.
C06	İş Planı İçinde Üretim Planları öğrenilir.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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. Okishi and W.W. Huebsch, John Wiley & Sons, Inc., Fluid Mechanics Fundamentals and Applications, Y**Course Category**

Mathematics 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)

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:

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

Mathematics 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, steady one dimensional heat conduction		
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 effectiveness		
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 heat conduction		
7	Numerical Methods in Transient Conduction: One and two dimensional transient heat conduction, controlling numerical error		
8	Forced Convection: Fundamentals of convection, classification of fluid flows, velocity boundary layer, thermal boundary layer		
9	Forced Convection: Fundamentals of convection, classification of fluid flows, velocity boundary layer, thermal boundary layer		
10	External Forced Convection: Drag force and heat transfer in external flow, parallel flow over flat plates, flow across cylinder		
11	Internal Forced Convection: Mean velocity, mean temperature, the entry region, constant surface heat flux and temperature		
12	Natural Convection: Physical mechanism, natural convection over surfaces and inside enclosures, combined natural and forced convection		
13	Thermal Radiation: Blackbody radiation, radiation intensity, radiative properties, Kirchhoff's law, atmospheric and solar radiation		
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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN399 Industrial Practice I					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
5	REN399	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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Associate Prof.Dr. İbrahim ÇAYIROĞLU

Recommended or Required Reading**Resources** Possessed resources during learning period,**Course Category**

Mathematics and Basic Sciences	: 30	Education	: 0
Engineering	: 30	Science	: 0
Engineering Design	: 10	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	To gain the ability of utilization of techniques and modern means for engineering applications.
C03	To gain the ability of utilization of techniques 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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:

Definition 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Prof.Dr. Emrah DENİZ

Recommended or Required Reading

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

Course Category

Mathematics 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	Introduction to international communication		
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.

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





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Undefined Dekanlık

Assistants:**Recommended or Required Reading****Resources** Elder L. Richard P. 2003, Analytical Thinking,**Course Category**

Mathematics 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	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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

The ability of understanding basic static and strength information, classifying machine elements with their properties, understanding working mechanisms of systems, Selecting the proper machine 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-requisites:**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

Mathematics and Basic Sciences	: 30	Education	: 0
Engineering	: 30	Science	: 0
Engineering Design	: 0	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	Choose machine elements together with the manufacturing and design stages.
C03	Describe welding, soldering, adhesive bonded and riveted connections.
C04	Recognize 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, worm systems, couplings, brakes, clutches, mechanisms of belt pulley.
C09	Calculate on the chain mechanisms and friction wheels

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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 Analysis of Mechanisms and Mechanisms, John J. Uicker, Jr., Joseph E. Denavit, Edward B. Bredentson, McGraw-Hill, 1989**Course Category**

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Instructor İsmail TOPRAK Prof. 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

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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

Mathematics and Basic Sciences	: 0	Education	: 0
Engineering	: 80	Science	: 0
Engineering Design	: 10	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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof.Dr. Kamil ARSLAN Dr. 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 Uygulamalar, 4. Basımdan Çeviri, Çeviri Editörü: Vedat Tanyıldız, Palme Yayınevi, 2019.
Y. A. Çengel ve A. J. Ghajar, Isı ve Kütle Transferi: Esaslar ve Uygulamalar, 4. Basımdan Çeviri, Çeviri Editörü: Vedat Tanyıldız, 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

Mathematics 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.

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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:**Teaching Methods and Techniques:****Prerequisites and co-requisites:****Course Coordinator:****Name of Lecturers:****Assistants:****Recommended or Required Reading****Resources****Course Category**

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:**Teaching Methods and Techniques:****Prerequisites and co-requisites:****Course Coordinator:****Name of Lecturers:****Assistants:****Recommended or Required Reading****Resources****Course Category**

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

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



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
Railway Systems 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:

Railway Systems 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 philosophy, processes of getting values, models of values education and values of Turkish society.

Teaching Methods and Techniques:

The meaning of value, Definitions 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-requisites:**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., Dilmaç, B. İnsanca Değerler Eğitimi, Nobel Yayınları, 2019.
-	-
-	-
-	-

Course Category

Mathematics 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 education	-	-
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, Trustworthiness)	-	-
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, Thriftiness)	-	-
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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**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**Course Category**

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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. Advantages 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 organizations. University-industry R&D association. Patents and legal regulations. R&D trends.

Prerequisites and co-requisites:**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

Mathematics 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	Configuration of technology and industry		
2	Advantages 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 organizations. 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 principles for establishing R&D management system.
C04	Employ in-house R&D management.
C05	Recognize patents and legal regulations

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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 mekanizmaları, etc.). Mechanisms of freedom. Machines, balancing; static and dynamic imbalance, equivalent to the masses, many-cylinder engines, crank-biyel mechanisms, balancing, balancing. Return to düzgünlüğü and the flywheel; return düzgünlüğü, 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-requisites:**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

Mathematics 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 düzgünlüğü and the flywheel; return düzgünlüğü, volanın needs to be resized.		
11	return to the düzgünlüğü and the flywheel; return düzgünlüğü, volanın needs to be resized.		
12	return to the düzgünlüğü and the flywheel; return düzgünlüğü, 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 mekanizmaları, 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 düzgünlüğü and the flywheel; return düzgünlüğü, volanın needs to be resized.
C05	Mekanik titreşimler; Tek serbestlik dereceli, sönümlü-sönümsüz, serbest ve zorlanmış titreşim hareketlerinin incelenmesi, titreşim izolasyonu. Burulma titreşimleri.

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





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Oğuzhan MENEMENCİOĞLU

Assistants:**Recommended or Required Reading****Resources**

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. Harris, Cengage Learning, Inc, 4-5th Edition.
 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

Mathematics 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 Tex		
2	What Is Ethics? Ethics in the Business World, Including Ethical Considerations in Decision Making, Ethics in Information Tex		
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

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
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:**

Prof. Dr. Kamil ARSLAN

Name of Lecturers:

Dr. Ali CAN

Assistants:**Recommended or Required Reading****Resources** Introduction to Fluid Mechanics, D. F. Young, B. R. Munson, T. H. Okishi and W.W. Huebsch, John Wiley & Sons, Inc., Fluid Mechanics Fundamentals and Applications, Yt**Course Category**

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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. Leadership. Complaint mechanism. Communication. Discipline. Health and protection.

Prerequisites and co-requisites:**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			
Mathematics 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	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. Leadership		
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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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:

Hidroliĝe Input, Hidrolikte basic principles, standard symbols, hydraulic pipes and Hoses, Hidrolikte Hydraulic Pumps, hydraulic Motors, hydraulic cylinders, Hydraulic Valves, sealing elements, Accumulators, hydraulic Fluid, oil Tank, filters, hydraulic, Electro hydraulic systems, hydraulic systems, Error Search, industry-hydraulic systems, hydraulic and Elektrohidrolik Circuit Applications fields of application.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Prof. Dr. İsmail KARACAN

Recommended or Required Reading**Resources** 1. Demirtaş, F. (2001). Hidrolik Ve Pnömatik. Ankara: Şafak Matbaacılık.
2. Karacan, İ. (2003). Hidrolik+Pnömatik. Karabük: İ.Karacan.
3. D.Merkle, B. (1996). H**Course Category**

Mathematics and Basic Sciences	: 40	Education	: 0
Engineering	: 40	Science	: 0
Engineering Design	: 0	Health	: 0
Social Sciences	: 0	Field	: 0

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.		
17	Final exam.		
50	Introduction to hydraulic.		
51	Final exam.		
52	Final exam.		
53	Hydraulic and electro-hydraulic circuit applications.		
54	Hydraulic and electro-hydraulic circuit applications.		
55	Hydraulic systems application areas in the industry.		
56	Hydraulic systems fault search.		
57	Electro-hydraulic systems.		
58	Hydraulic accumulator and fluid.		
59	Hydraulic valves, oil tank and filters.		
60	Midterm exam.		
61	Hydraulic cylinders, sealing elements.		
226549	Basic principles of hydraulic.		
226551	Hydraulic standard symbols.		
226553	Hydraulic pipes and hoses.		
226555	Hydraulic pumps.		
226557	Hydraulic motors.		

Course Learning Outcomes

No	Learning Outcomes
C01	They know the basic principles of hydraulic.
C02	They recognize the standard symbols of hydraulic.
C03	They recognize hydraulic pipes and hoses.
C04	They recognize hydraulic pumps.
C05	They recognize hydraulic engines.
C06	They make hydraulic and electro-hydraulic circuit applications.

Assessment Methods and Criteria		
In-Term Studies	Quantity	Percentage
Mid-terms	1	%20
Quizzes	0	%0
Assignment	1	%5
Attendance	0	%0
Practice	0	%0
Project	1	%15
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	0	0	0
Assignments	3	4	12
Presentation	0	0	0
Mid-terms	1	8	8
Practice	0	0	0
Laboratory	0	0	0
Project	4	6	24
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
Railway Systems 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:

Railway Systems 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 program 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-requisites:**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

Mathematics and Basic Sciences	: 30	Education	: 0
Engineering	: 30	Science	: 0
Engineering Design	: 0	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 program 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		
17	(Submission projects) 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.

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
Railway Systems 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:

Railway Systems 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-requisites:

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

Mathematics 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

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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. Management of information, learning, culture, structure, continuity, power and politics in organizations. Management ethics. 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-requisites:

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 of Industrial Engineering, \

Course Category			
Mathematics 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	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	Management of information, learning, culture, structure, continuity, power and politics in organizations		
6	Management ethics		
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	3. Önerilen kaynaklar: 1. Chelsom, J. V., Payne, A. C., Reavill, R. P., Management for Engineers, Scientists and Technologists, 2004, 2. Salvendy, G., Handbook of Industrial Engineering, \

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

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:

Railway Systems 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-requisites:**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

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

The aim of this course is to teach scientific research and analysing 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 analysis 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Asist Prof.Dr. Yasin DÖNMEZ Associate 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, Ra**Course Category**

Mathematics 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	Scientific research and analysis techniques		
2	Scientific research and analysis techniques		
3	Scientific research and analysis techniques		
4	Data collecting and data analysis according to scientific research techniques		
5	Data collecting and data analysis according to scientific research techniques		
6	Data collecting and data analysis 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 obtaining results both in school life and business life.
C03	Recognize ethics in research activities.
C04	Use literatur for scientific research.
C05	Prepare an effective presentation.
C06	Present research subjects

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Undefined Dekanlik

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

Mathematics 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	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.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisites:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

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
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Undefined Dekanlık

Assistants:**Recommended or Required Reading****Resources** 1. Orhan Küçük, Standardizasyon ve Kalite, 2004
Course Category

Mathematics 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	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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN326 System Dynamics and Control					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
6	REN326	System Dynamics and Control	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:

Railway Systems Engineering

Type of Course Unit:

Elective

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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Samet Uslu

Assistants:**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

Mathematics and Basic Sciences	: 30	Education	: 0
Engineering	: 30	Science	: 0
Engineering Design	: 0	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 systems.
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.

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			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Teaching Methods and Techniques:

Prerequisites and co-requisites:

Course Coordinator:

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources

Course Category

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

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



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
Railway Systems Engineering

REN4004 Accident Investigation					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4004	Accident Investigation	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Investigating and classifying the accidents that occur in railways, revealing the causes of the accident, following the accident pioneers, In order to prevent the accident; to provide students with knowledge, skills, and attitudes.

Teaching Methods and Techniques:

Kaza Araştırma ve İnceleme, TCDD Accident Research, Investigation and Reporting Directive, Reporting Applications

Prerequisites and co-requisites:**Course Coordinator:**

Dr. Mehmet Emin AKAY

Name of Lecturers:**Assistants:****Recommended or Required Reading**

Resources TCDD Transport Accident Investigation Directive

Course Category

Mathematics and Basic Sciences	:		Education	:	50
Engineering	:	50	Science	:	
Engineering Design	:		Health	:	
Social Sciences	:		Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Safety Management System General IntroductionThe Place and Importance of Accident Investigation in Safety Manager		
2	Accident Definitions, Root Causes, Other Definitions		
3	Accident Pioneers "Events, Near-Miss Events"		
4	Common Methods Used in Calculating Economic Effects of Accidents		
5	Good Examples and Stages in Accident Investigation		
6	Accident Investigation Report		
7	Evidence Collection, Safety Management System Analysis		
8	MIDTERM EXAM		
9	Purpose, Scope, Basis and Definitions of TCDD Accident Research, Investigation and Reporting Directive		
10	Accident and Its Types		
11	Accident Pioneers Classification and Criteria, Establishment of Accident Research, Investigation and Reporting Teams and W		
12	Investigation of Accidents and Reporting		
13	Evaluation of Accident Investigation ReportsImpartiality Provisions		
14	Accident Investigation Report Form and ContentAccident Investigation Report Shape and Content		
15	Accident Results Notification FormAccident/Cause Tree		

Course Learning Outcomes

No	Learning Outcomes
C01	Students can explain railroad accidents and their classification.
C02	Students can explain accident pioneers.
C03	Students can explain the accident investigation and investigation stages.
C04	Students learn the applications of TCDD Accident Research, Investigation and Reporting Directive.
C05	Students learn about the duties of the Accident Research, Investigation and Reporting Teams.
C06	Students can prepare accident investigation and investigation reports and explain the procedures related to the reports.
C07	Students can explain the monitoring and evaluation of accident/incident indicators.

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



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
Railway Systems Engineering

REN4015 Basics of HVAC					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4015	Basics of HVAC	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof.Dr. Emrah DENİZ

Assistants:**Recommended or Required Reading**

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

Course Category			
Mathematics 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 psychrometry		
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.

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			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems Engineering

MEE4046 Construction Techniques					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	MEE4046	Construction 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

To introduce construction techniques in different kinds of major infrastructures together with their histories that are explained and overviewed.

Teaching Methods and Techniques:

Development of construction technology, Architectural technology, Tunneling technology, Bridge technology, River management technology, Dam technology, Offshore and port technology, Foundation technology, Soil improvement technology, Shield tunneling technology.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Recep Demirsöz

Assistants:**Recommended or Required Reading****Resources** Fundamentals of Building Construction: Materials and Methods, 5th Edition 5th Edition, by Edward Allen (Author), Joseph Iano (Author)**Course Category**

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

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Development of construction technology		
2	Architectural technology		
3	Tunneling technology		
4	Tunneling technology		
5	Bridge technology		
6	Bridge technology		
7	River management technology		
8	River management technology		
9	Dam technology		
10	Dam technology		
11	Offshore and port technology		
12	Foundation technology		
13	Soil improvement technology		
14	Shield tunneling technology		

Course Learning Outcomes

No	Learning Outcomes
C01	Learn the development of construction technology
C02	Define Architectural technology
C03	Discuss Tunneling technology
C04	Discuss Bridge technology
C05	Learn River management technology
C06	Define Dam technology

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	6	72
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	32	32
Total Work Load			202
ECTS Credit of the Course			7

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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	0	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

English (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

The main aim of this course is to provide students with knowledge about electric and hybrid vehicles and to learn the electrical and electronic systems used in these vehicles. Thus, students learn the modeling, analysis and control techniques of hybrid and electric vehicles.

Teaching Methods and Techniques:

Fundamentals of Electric Theory. Structure of Electric Vehicles. Types of Hybrid Vehicles. Structure of Hybrid Electric Vehicles. Battery technology. Regenerative Braking. Modeling, analysis and control of electric and hybrid vehicle systems.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Prof.Dr. M. Bahattin ÇELİK Associate ProfDr. Selami Sağırođlu

Assistants:**Recommended or Required Reading**

Resources Modern Electric Vehicle Technology, C.C. Chan, K.T. Chau. Oxford Science Publications, 2001

Course Category

Mathematics and Basic Sciences	:		Education	:	
Engineering	:	50	Science	:	
Engineering Design	:	50	Health	:	
Social Sciences	:		Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction to the history and development of electric and hybrid vehicles		
2	Typical electric and hybrid vehicle structure		
3	Battery Charging		
4	Engine controllers		
5	Working principles of controllers		
6	Electric vehicles today		
7	Fuel cells		
8	Features of electric vehicles		
9	Torque-speed graph of a hybrid vehicle		
10	Battery and electric vehicle performance		
11	Series and Parallel Hybrid Vehicles, Complex Systems		
12	Electric Motor Types Used in Electric Hybrid Vehicles		
13	Batteries Used in Electric and Hybrid Vehicles		
14	Comparison of electric vehicles with internal combustion engine vehicles		

Course Learning Outcomes

No	Learning Outcomes
C01	Tipik bir elektirikli araç ve hibrit aracı teşhis eder
C02	Batarya şarj etme, kontrolörün çalışması ve kontrolör tiplerini açıklar
C03	Taşıt uygulamalarında elektirikli motor tipleri, hibrit aracın tork-hız grafiđini tanımlar
C04	Elektirikli motorlarla içten yanmalı motorların kıyaslamasını yapar
C05	Günümüzde kullanılan akü tiplerini tanımlar
C06	Günümüzde hibrit araçlarda kullanılan teknolojileri tanımlar
C07	Yakıt hücresi teknolojisini ve uygulamalarını açıklar

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	10	3	30
Assignments	3	5	15
Presentation	0	0	0
Mid-terms	1	14	14
Practice	0	0	0
Laboratory	0	0	0
Project	2	5	10
Final examination	1	11	11
Total Work Load			122
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN4005 Electrification Systems					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4005	Electrification Systems	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

To make our students have detailed information about electric rail system facilities (traction transformer centers, catenary line etc.) and electric rail system vehicles (metro, tram, locomotive, etc.). To teach the design of traction transformer substation, railway substation and catenary systems. To examine in detail the electrical equipment of electric rail vehicles.

Teaching Methods and Techniques:

Basic concepts of electric rail systems. Rail system electrification, traction transformer substations, catenary systems. Traction transformer center design. Railway substation design. Electrical equipment of electric rail vehicles. Protection in electric rail systems.

Prerequisites and co-requisites:

Course Coordinator:

Dr. Mehmet Emin AKAY

Name of Lecturers:

Assistants:

Recommended or Required Reading

Resources Kiessling, Puschmann, Schmieder, Schneider, Contact Lines for Electric Railways: Planning, Design, Implementation, Maintenance (3rd Edition, 2016, Publicis)

Course Category

Mathematics and Basic Sciences	:		Education	:	
Engineering	:	50	Science	:	
Engineering Design	:	50	Health	:	
Social Sciences	:		Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic concepts of electrification.		
2	Historical development and importance of rail systems		
3	Electric rail electrification, catenary facility, rigid catenary facility, third rail.		
4	Electric rail electrification, catenary facility, rigid catenary facility, third rail.		
5	Traction transformer substations for tram, light metro and metro systems operating with DC voltage		
6	Design of traction transformer substations and DC catenary lines		
7	Design of traction transformer substations and DC catenary lines		
8	MIDTERM EXAM		
9	Transformer substations and design for railway systems operating with AC 25 kV voltage		
10	Design of railway transformer substations and AC 25 kV catenary lines		
11	Electrical equipment inspection of commuter trains with AC 25 kV voltage		
12	Examination of electrical equipment of electric locomotives and diesel electric locomotives for railways		
13	Investigation of electrical equipment of high speed trains.		
14	Protection technique in electric rail systems		
15	Protection technique in electric rail systems		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will have information about rail system elements.
C02	Students will gain the ability to learn the structures and operating principles of electric rail system facilities and vehicles.
C03	Students will gain the ability to design electrical equipment of electric rail vehicles.
C04	Students will gain the ability to make relay coordination calculations for electric rail system facilities.
C05	Students will gain the ability to design traction transformer centers for electric rail systems.

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Fatih PEHLIVAN

Assistants:**Recommended or Required Reading****Resources** Asansörler ve Yürüyen Merdivenler, E.İmrak**Course Category**

Mathematics 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

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN4016 Energy Management					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4016	Energy Management	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Prof. Dr. Emrah DENİZ

Assistants:**Recommended or Required Reading****Resources** Sustainable Energy Management,-

Course Category			
Mathematics 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.

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			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Erhan Kayabaşı

Assistants:**Recommended or Required Reading****Resources**

- Isı deđiřtiricileri, Prof.Dr. Osman F. Genceli ,Heat Exchangers, selection,rating, and thermal design, Sadık Kakađ, Hongtan Liu,Fundamentals of Heat Exchanger Design, Ramesh K. Shah and Dusan P. Sekulic
1. Isı deđiřtiricileri, Prof.Dr. Osman F. Genceli
 2. Heat Exchangers, selection, rating, and thermal design, Sadık Kakađ, Hongtan Liu
 3. Fundamentals of Heat Exchanger Design, Ramesh K. Shah and Dusan P. Sekulic

Course Category

Mathematics and Basic Sciences	:	70	Education	:
Engineering	:	30	Science	:
Engineering Design	:		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	Economic 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.

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			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN497 Industrial Practice II					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN497	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:

Railway Systems Engineering

Type of Course Unit:

Required

Objectives of the Course:

Learn the practice techniques in the field of Automotive engineering and provide sufficient practical work

Teaching Methods and Techniques:

Assessment of the production, assessment the type and characteristics of the assembly line, the finished goods manufacturing business flow chart plotting, promotion of the organization and production units and functions specified, investigation and introduction of the machines

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:****Assistants:**

Associate Prof.Dr. İbrahim ÇAYIROĞLU

Recommended or Required Reading**Resources** Lecture notes and documents,**Course Category**

Mathematics and Basic Sciences	: 40	Education	: 0
Engineering	: 40	Science	: 0
Engineering Design	: 0	Health	: 0
Social Sciences	: 0	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	To learn the production units tasks.
C02	To learn the characteristics of production line.
C03	To learn the flow chart of the business units.
C04	To recognize the organization of factory.
C05	To recognize the units of production process.

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	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
Railway Systems Engineering

REN490 Industrial Training					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN490	Industrial Training	5	5	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Required

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-requisites:**Course Coordinator:****Name of Lecturers:**

Associate Prof.Dr. Selami Sağıroğlu

Assistants:**Recommended or Required Reading**

Resources Documents of the applied enterprise

Course Category

Mathematics 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.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN4010 Intelligent Transportation					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4010	Intelligent Transportation	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

To cite basic structures of smart vehicle technology through the eyes of a designer to the students.

Teaching Methods and Techniques:

General concept of the vehicle, The general history and development of automotive, General automotive systems, Automotive fuel economy, Human safety, The importance and the recent developments of driver assistance systems, Extensive examination and investigation of automotive mechatronic systems such as electronic ignition, air bag systems, Immobilizer, ABS, etc., vehicle dynamics control (VDC ABS ASR ESP), active and semi-active suspension control.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Associate Prof.Dr. Selami SAĞIROĞLU

Assistants:**Recommended or Required Reading**

Resources	Share	Facebook	Twitter	Pinterest	28 used & new from \$9.38	Deliver to Turkey	See All Buying Options	Add to List
1. Automotive - Understanding Automotive Electronics.pdf								

Course Category

Mathematics and Basic Sciences	: 50	Education	: 0
Engineering	: 30	Science	: 0
Engineering Design	: 20	Health	: 0
Social Sciences	: 0	Field	: 0

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	General history of the development of public transport concept		
2	Microprocessor control systems		
3	Automobile sensors systems		
4	Automobile sensors systems		
5	Car Actuator Systems		
6	Fuel economy in automotive, human safety, importance of driver assistance systems and developments in recent years		
7	Fuel economy in automotive, human safety, importance of driver assistance systems and developments in recent years		
8	Fuel economy in automotive, human safety, importance of driver assistance systems and developments in recent years		
9	Smart Vehicles and Control Systems		
10	Smart Vehicles and Control Systems		
11	Smart Vehicles and Control Systems		
12	Smart vehicles and control systems		
13	Smart systems		
14	Smart systems		

Course Learning Outcomes

No	Learning Outcomes
C01	Describe general structure of the vehicles, history, development complete
C02	Have knowledge about the importance of fuel saving, human safety, driver assistance systems and developments in recent years.
C03	Electronic ignition, air bag systems, immobilizer, ABS, drive, brake, steer, shift, such as the application of a wide range of mechatronics applied automotive systems.
C04	Analyze all intelligent systems

Assessment Methods and Criteria		
In-Term Studies	Quantity	Percentage
Mid-terms	1	%30
Quizzes	0	%0
Assignment	0	%10
Attendance	0	%0
Practice	0	%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	3	42
Hours for off-the-c.r.stud	14	8	112
Assignments	1	18	18
Presentation	0	0	0
Mid-terms	1	12	12
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	24	24
Total Work Load			208
ECTS Credit of the Course			7

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

To introduce the principles of basic manufacturing procedures, the equipment used and their application areas.

Teaching Methods and Techniques:

Classification of manufacturing methods; their comparison, advantages and limits. Design-manufacturing relationship; selection of manufacturing method, casting, welding, plastic forming, machining and powder metallurgy manufacturing methods, Manufacturing with plastic and composite materials, ceramic part production.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Associate Prof.Dr. Mehmet ÇELİK

Assistants:**Recommended or Required Reading**

Resources	Internal Combustion Engines Nobel Publications İçten Yanmalı Motorlar Birsen Yayınevi
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Course Category

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

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Working principles of engines.		
2	Thermodynamic cycles of internal combustion engines		
3	Thermodynamic cycles of internal combustion engines		
4	engine performance parameters		
5	engine performance parameters		
6	friction force in the cylinder and lubrication system		
7	friction force in the cylinder and lubrication system		
8	Mid-term		
9	combustion in engines		
10	alternativefuels		
11	mixture formation		
12	Emissions in engines		
13	Engine tests, engine characteristics, new technologies		
14	Thermal losses in engines		
15	Final Exam		

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.

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	15	15
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			125
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes



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
Railway Systems Engineering

REN4017 Manufacturing Processes II					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4017	Manufacturing Processes II	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

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-requisites:**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

Mathematics 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, c)		
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 ex		

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

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems 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-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Recep Demirsöz

Assistants:**Recommended or Required Reading****Resources** Manual for Materials Inspection, Illinois Department of Transportation, 2011 , , 0000.**Course Category**

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

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	Demagnetization 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	Students will be learn about quality, quality control and control methods
C02	Students will be learn Non-destructive inspection methods and practices of the the area
C03	Students will be learn recognize the breaking mechanism
C04	Students will be learn acoustic emission testing methods, Ultrasonic and Radiography methods
C05	Students will be learn destructive testing methods
C06	Students will be learn eddy currents and other methods

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	4	56
Hours for off-the-c.r.stud	9	3	27
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	36	36
Total Work Load			155
ECTS Credit of the Course			5

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems 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 (9%100)

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

To introduce industrial measurement methods and applications, to teach error analysis and statistical methods.

Teaching Methods and Techniques:

Definition of measurement and control, classification of measurement control tools, measurement errors, reading of the vernier partition system, calipers, micrometers, comparators, gauges, gauges, protractors, pneumatic measurement, gear wheels, buffers and fork gauges properties, usage, properties of screw gauges, usage Measuring angles with a sine table, surface roughness measurement, hardness measurement devices, hardness measurement methods, electrical length measurement, optical measurement, temperature and pressure are measured.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Prof.Dr. Mustafa Bahattin ÇELİKDr. Ahmet Emrah ERDOĞDU

Assistants:**Recommended or Required Reading**

Resources Engineering Metrology, Khanna Publishers. R.K. Jain.,Quality Control, Tata McGraw Hill Publishing Ltd. TTTI Madras,Ölçme Tekniği, Prof.Dr. H. Hüseyin ÖZTÜRK, Birsen Y
Mechanical measurements and Metrology course notes

Course Category			
Mathematics 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	Introduction to measurement and metrology		
2	Measuring systems		
3	Units		
4	Mechanical measuring instruments		
5	Calipers and micrometers		
6	Surface and angle measurement and control		
7	Gauges		
8	Measuring density, pressure, force and weights		
9	Midterm examination		
10	Surface hardness and roughness measurements		
11	Measuring Speed, Flow and Revolution		
12	Measuring Temperature, Light, and Radiation		
13	Calibration		
14	Error analysis and statistical methods		
15	Standards, Measurement and Quality control		
16	Final examination		
17	Resit examination		

Course Learning Outcomes	
No	Learning Outcomes
C01	Know the measuring equipment
C02	Know the concepts of metrology and traceability
C03	Calculate measurement uncertainty and carry out error analysis
C04	Know the units and standards

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





Karabük University

Faculty of Engineering
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Purpose of this course is to advance knowledge of the students about quality control and to develop quality conscious.

Teaching Methods and Techniques:

Basic concepts about quality and quality control. Quality control in vocational field. Concepts of basic standardization. Standardization of vocational field. Total quality management. Statistical quality control method. Quality reliability system, ISO 9000 standards. Tests of quality performance in vocational goods. Concept of reliability.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Cevat ÖZARPA

Assistants:**Recommended or Required Reading**

Resources Şimşek, M., Quality Management, Alfa Publications, 1998, Istanbul.

Course Category

Mathematics and Basic Sciences	:	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic concepts about quality and quality control.		
2	Quality control in vocational field.		
3	Quality control in vocational field.		
4	Concepts of basic standardization. Standardization of vocational field.		
5	Concepts of basic standardization. Standardization of vocational field.		
6	Concepts of basic standardization. Standardization of vocational field.		
7	Total quality management.		
8	Total quality management.		
9	Statistical quality control method.		
10	Statistical quality control method.		
11	Quality reliability system, ISO 9000 standards.		
12	Quality reliability system, ISO 9000 standards.		
13	Tests of quality performance in vocational goods.		
14	Concept of reliability.		

Course Learning Outcomes

No	Learning Outcomes
C01	Will be able to evaluate the dimensions of the concept of quality, quality management and quality components.
C02	Will be able to analyze the issue of quality system in terms of quality structure - quality problems.
C03	Will be able to analyze quality control concepts and methods.

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	1	26	26
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			126
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes



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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Main purpose of the course students, giving knowledge about 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-requisites:**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

Mathematics 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 releasers.		
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 maintenance and repair of transport systems.

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	2	24
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			118
ECTS Credit of the Course			4

Contribution of Learning Outcomes to Programme Outcomes





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN4013 Transportation Economy					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN4013	Transportation Economy	3	3	5

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Providing quantitative information about the relationship of transportation with the economy, introducing evaluation methods in order to make a choice between transportation investments.

Teaching Methods and Techniques:

Temel iktisat bilgisi, ulařtırma ve ekonomi, ulařtırma talebi, ulařtırma ve kentsel/bölgesel gelişme, ulařtırmanın doğrudan maliyetleri, ulařtırmanın dıřsal maliyetleri, ulařtırma hizmetlerinin ücretlendirilmesi, ulařtırma hizmetinin dıřsal maliyetlerinin karşılanması, ulařtırma hizmetinde tekel ve kamu hizmeti.

Prerequisites and co-requisites:**Course Coordinator:**

Dr. Mehmet Emin AKAY

Name of Lecturers:**Assistants:****Recommended or Required Reading**

Resources 1. E. Quinet, R. Vickerman, Edward Elgar, "Principles of Transport Economics", (Publishing, ISBN 1-84064-865-1, 2004), 2. Kenneth J. Button, Edward Elgar, "Transport E

Course Category

Mathematics and Basic Sciences	:		Education	:	
Engineering	:	50	Science	:	
Engineering Design	:		Health	:	
Social Sciences	:	50	Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Basic economics		
2	Basic economics		
3	Basic economics		
4	Transportation and economics		
5	Transportation and economics		
6	Transportation demand		
7	Transportation demand		
8	MIDTERM EXAM		
9	The impact of transportation on urban/regional development		
10	The impact of transportation on urban/regional development		
11	External costs of transportation		
12	Pricing of transportation services		
13	Recovering external costs of transportation		
14	Monopoly and public service in transportation service		
15	Evaluation methods of investment alternatives		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will be able to quantitatively analyze the relationship between transportation service and economics.
C02	Students will recognize the methods of evaluating investment options.
C03	Students will have the knowledge to take responsibility in middle/top level management of transportation companies.

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



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
Railway Systems 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:

Railway Systems Engineering

Type of Course Unit:

Elective

Objectives of the Course:

Understanding the basic principles used in simulations of mathematical models of vehicle systems; Using these principles to simulate the dynamic system responses of vehicles; Introduction of modeling and analysis issues for automatic control designs of vehicles.

Teaching Methods and Techniques:

Lateral Vehicle Dynamics and Control, Longitudinal Vehicle Dynamics and Control, Electronic Stability Control, Anti-Roll Control and Bogie Dynamics and Control.

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Dr. Engin YILDIRIM

Assistants:**Recommended or Required Reading**

Resources 3. Simon Iwnicki, Handbook of Railway Vehicle Dynamics 1st Edition (CRC Press-2006),1. Vijay K. Garg and Rao V. Dukkipati, Dynamics of Rail Vehicle Systems, (Academ

Course Category

Mathematics and Basic Sciences	:		Education	:	
Engineering	:	50	Science	:	
Engineering Design	:	50	Health	:	
Social Sciences	:		Field	:	

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Introduction		
2	Wheel-rail mechanics and mathematical modeling		
3	Wheel-rail mechanics and mathematical modeling		
4	Rail System Vehicle Lateral Dynamics		
5	Rail System Vehicle Lateral Dynamics		
6	Bogie dynamics		
7	Longitudinal vehicle dynamics		
8	MIDTERM EXAM		
9	Longitudinal vehicle control		
10	Longitudinal vehicle control		
11	Vehicle stability control		
12	Vehicle stability control		
13	Anti-derailment control		
14	Active suspension control		
15	Intelligent Transportation Systems		

Course Learning Outcomes

No	Learning Outcomes
C01	Students will gain the ability to develop and apply mathematical models of vehicle dynamics behavior and analyze their results.
C02	Students will gain the ability to mathematically understand wheel-rail interaction and to determine the effect of this behavior on vehicle performance.
C03	Students will gain the ability to determine the effect of bogie on vehicle and stability.
C04	Students will gain the ability to examine the effects of electronic control systems such as ABS, ESC, SBW and active suspension on vehicle driving performance.
C05	Students will learn the control structures commonly used in vehicles.

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





Karabük University

Faculty of Engineering
Railway Systems Engineering

REN492 Workplace Practice					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
7	REN492	Workplace Practice	15	7	20

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Bachelor's Degree

Work Placement(s):

No

Department / Program:

Railway Systems Engineering

Type of Course Unit:

Required

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-requisites:**Course Coordinator:**

Prof. Dr. Emrah Deniz

Name of Lecturers:**Assistants:****Recommended or Required Reading**

Resources	Instructor Lecture Notes
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Course Category

Mathematics 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.

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



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

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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



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



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

