

TAR-101 HISTORY OF PRINCIPLES AND REVOLUTIONS OF ATATURKS- I							Electrical and Electronics Engineering			
Semester	Teaching Methods							Credits		
	Lecture	Recite	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS Credit	
1	30					70	100	2	2	
Language	Turkish									
Compulsory / Elective	Compulsory									
Prerequisites	None									
Course Contents	Modernization process of Turkey									
Course Objectives	To teach stages of establishment in modern Turkey									
Learning Outcomes and Competences	Having Knowledge about establishment of Turkish Republic and Ataturk									
Textbook and /or References	Books and articles in Turkish									
Assessment Criteria								If any, mark as (X)	Percent (%)	
	Midterm Exams							X	50	
	Quizzes									
	Homework									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
	Final Exam							X	50	
Instructors										
Week	Subject									
1	Conceptions revolution and etc									
2	Regression causations of Ottoman Empire (internal and external causations)									
3	Modernization activities in Ottoman Empire (Periods of the Mahmud I and Selim III)									
4	Innovations at the period of Mahmud II.									
5	Political position and dismemberment of Ottoman Empire during 19 th century									
6	Period of Tanzimat									
7	Period of Constitutional Monarchy									
8	Midterm Exam									
9	Pan Slavism, Ottomanism,									
10	Pan-Islamism, Occidentalism									
11	Turkism, pan-turanism									
12	Wars of Trablusgarp and I.-II. Balkan									
13	Causes and results of First World War									
14	Mustafa Kemal Pasha, Congresses of Erzurum and Sivas									
15	The national oath and establishment of TBMM									

EE -103 Introduction to Electric and Electronic Engineering					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
1	30				70	100	2	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Fundamental of electric engineering, electric circuit, circuit component and basic laws, analysis techniques, alternating current circuit, multiphase systems, transient state. Electronics circuit, diode, transistor, operating amplifier, digital electronic.							
Course Objectives	To develop analyzing capability of students and preparing academics background of engineering courses							
Learning Outcomes and Competences	The student that took this lecture will gain proficiency of starting fundamental courses of electric electronic engineering.							
Textbook and /or References	1. John Bird, "Electrical and Electronic Principles and Technology", Newnes, 2nd edition , 2003 2. Ray Powell, "Introduction to Electric Circuits", Arnold, 1995 3. Arifoğlu Uğur, Elektrik Elektronik Mühendisliğinin Temelleri, Cilt-I-II Alfa Yay. İstanbul (2000).							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam						X	50	
Instructors								
Week	Subject							
1	Units associated with basic electrical quantities							
2	Introductions to electric circuits, quantity of electric and current, power, define of circuit components. Series and parallel networks,							
3	Resistance variations, Ohm's laws and their applications,							
4, 5	Chemical effect of electricity, electrolysis, internal resistance, accumulators,							
6, 7	Capacitors and capacitance, series and parallel networks.							
8	Magnetic circuits, magnetic fields, magnetic flux and flux density							
9	Electromagnetism, laws of electromagnetic induction							
10	Electromagnetism, electromagnetic induction							
11	Semiconductor materials, types of materials, The p-n junction							
12	Semiconductor diodes, The p-n junction							
13	Transistor, the bipolar junction transistor,							
14	Transistor, the bipolar junction transistor,							

ENF-101 Basic Computer Technology				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
1	15		30			55	100	0	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	<p>Concepts about usage of basic information technologies, Hardware, software, PC, Server vs. Computer hardware, (CPU, RAM, Harddisk, VGA card, Mainboard, CDRoom vs...)</p> <p>Operating systems and MS XP operating system and file management system Windows XP desktop and file management system File compressing, virus and how to clean virus</p> <p>Introduction to MS Office Word and its usage. Introduction to MS Office Excel and its usage Usage of MS Office Excel Introduction to MS Office PowerPoint and its usage</p>								
Course Objectives	Students: Know computer and concepts about computer, recognize computer hardware and software. Use MS windows operating system. Use basic level MS Office Word, Excel and powerpoint								
Learning Outcomes and Competences	<p>End of this course each student will be able to explain :</p> <ol style="list-style-type: none"> 1. importance of computer in daily life; 2. concepts about computers; 3. computer hardware and their functions; 4. operating systems; 5. office software and their usage. 								
Textbook and /or References	<ul style="list-style-type: none"> • Basic Usage of Information Technology, O. Faruk BAY, O. Ayhan ERDEM, Ankara, 2006 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Concepts about usage of basic information technologies, Hardware, software, PC, Server ...								
2	Computer hardware, (CPU, RAM, Harddisk, VGA card, Mainboard, CDRoom vs...)								
3	Operating systems and MS XP operating system and file management system								
4	Windows XP desktop and file management system								
5	Windows XP file management system								
6	File compressing								
7	Viruses and how to clean a virus								
8	Introduction to MS Office Word and its usage								
9	Interm Exam								
10	MS Office Word and its usage								
11	Usage of MS Office Excel								
12	Usage of MS Office Excel								
13	Usage of MS Office Excel								
14	Introduction to MS Office PowerPoint and its usage								
15	Introduction to MS Office PowerPoint and its usage								

TÜR-101 TURKISH LANGUAGE I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS Credit
I	30					70	100	2	2
Language	Turkish Language								
Compulsory / Elective	Obligatory								
Prerequisites	N/A								
Course Contents	Notice, Language & Features of the Language, Language – Thought Relation, Mother Tongue, Context, Language and Expression, Symbol – Image, Culture (Language – Culture Relation, Culture Types), Civilization, Petition Writing, Languages around the World and Place of Turkish Language among World Languages (Formation of Languages, Types of Languages, Classifications of the Languages, Place of Turkish Language among World Languages), Historical Periods and Progress of Turkish Language, Current Status and Spreading Areas of the Turkish Language, Grammar and Sections (Phonetics, Formatting), Elements in Turkish Language from Foreign Language, Orthography and Application, Punctuation Marks and Usage Related Applications.								
Course Objectives	Recognition of evolution of language, culture and civilization concepts, recognition of historic background and features of Turkish Language, recognition of how orthography and punctuation marks shall be used; gaining and improvement of scientific, questioning, critical commenting, creative and constructive thinking habits.								
Learning Outcomes and Competences	To let students to sense the features and operational rules of Turkish language and illustrate; to improve vocabulary of the students via written and oral texts; to let students to gain compliance with spelling rules and appropriate usage of punctuation marks habits; to let students to gain book reading habits; to let students to gain scientific, questioning, critical commenting, creative and constructive thinking habits.								
Textbook and /or References	Yakıcı, Ali; Yücel, Mustafa; Doğan, Mehmet; Yelok, Veli Savaş; Üniversiteler İçin Türk Dili ve Kompozisyon Bilgileri, (Editör: Veli Savaş YELOK), Bilge Yayınları, Ankara, 2005.								
Assessment Criteria							If any, markas (X)	Percent (%)	
	Midterm Exam						X	50	
	Quizzes								
	Homework								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam						X	50		
Instructors									
Week	Subject								
1	Notice, Language & Features of the Language,								
2	Language – Thought Relation								
3	Mother Tongue, Context, Language and Expression, Symbol – Image								
4	Culture (Language – Culture Relation, Culture Types)								
5	Civilization, Petition Writing,								
6	Languages around the World (Formation of Languages, Types of Languages, Classifications of the Languages)								
7	Place of Turkish Language among World Languages,								
8	Midterm exam								
9	Historical Periods and Progress of Turkish Language,								
10	Current Status and Spreading Areas of the Turkish Language,								
11	11. Grammar and Sections (Phonetics, Formatting),								
12	12. Elements in Turkish Language from Foreign Language,								
13	13. Orthography and Application,								
14	14. Punctuation Marks and Usage Related Applications.								
15	Punctuation Marks and Usage Related Applications.								

FIZ -101 PHYSISC I				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
1	45	15			40	100	3,5	5
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Units and vectors, Motion in one dimension, Motion in two dimensions, Basic forces of universe and Newton's laws of motion, Work and energy, Circular motion, Applications of Newton's laws, Potential energy, Energy conservation, Linear momentum and collisions, Rotation of a rigid body about an axis, Rolling motion and angular momentum, Torque, Static equilibrium, oscillatory motion, Law of universal gravitation, Pressure and basics of fluid mechanics							
Course Objectives	Teaching the fundamental concepts and principles of physics in detail. Giving general knowledge to students about the laws of motion, Preparing the students to their own field courses by teaching the applications of physical principles to their field.							
Learning Outcomes and Competences	It is provided students with improvement in capability of solving basic concept of physics problem and analysing them.							
Textbook and /or References	Kemal Çolakoğlu (Çeviri Editörü) Palme Yayıncılık Fizik İlkeleri 1 Kemal Çolakoğlu (Çeviri Editörü) Palma Yayıncılık Fen ve Mühendislik için Fizik 1							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week	Subjects							
1	Unit Systems and Vectors							
2	Motion in One Dimension							
3	Motion in Two Dimensions							
4	Fundamental Forces of Universe and the Newton's Laws of Motion							
5	Applications of Newton's Laws and Force of Universal Gravitation							
6	Midterm Exam							
7	Concepts of Work-Energy and Their Applications							
8	Potential Energy and Conservation of Energy							
9	Linear Momentum and Collisions							
10	Circular Motion							
11	Rotation of a Rigid Body about an Axis							
12	Torque and Static Equilibrium							
13	Rolling Motion and Angular Momentum							
14	Oscillatory Motion and Its Applications							
15	Fundamentals of Fluid Mechanics							

KIM 101 Chemistry				Electrical and Electronics Engineering			
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
1	45	15		40	100	3.5	4
Language	Turkish						
Compulsory / Elective	Compulsory						
Prerequisites	No						
Course Contents	Fundamental concepts in Chemistry: Matter, element, compound, mole, mixture and some chemical concepts. Basic chemistry laws: Law of conservation of mass, law of constant composition, law of multiple proportions etc. Atomic and mole mass. Symbols, formulas, equations and compounds. Determination of empirical and molecular formulas. The oxidation state concept, describing and naming of chemical compounds. Chemical reactions and chemical equations, stoichiometry. Oxidation-reduction reactions (redox). The periodic table and some atomic properties. Electronegativity, ionization energy, electron affinity, quantum numbers and electron orbitals. Gases: The simple gas laws, the ideal gas equation, kinetic theory of gases, non-ideal (real) gases. Thermochemistry: Heat, heats of reaction and calorimetry. Chemical bonding: Basic concepts: Covalent and ionic bonding. Liquids, solids, and intermolecular forces. Solutions and their physical properties. Chemical equilibrium. Acids, bases and aqueous solution equilibrium. Thermodynamics: Some terminology, the laws of thermodynamics, Hess's law, Gibbs free energy. Electrochemistry: Faraday Laws, electrolysis, battery potential, Nernst equation. Organic Chemistry: Classification of organic compounds. Hydrocarbons (alkanes, alkenes and alkynes), alcohols, phenols, ethers, aldehydes and ketones. Carboxylic acids and their derivatives.						
Course Objectives	In order to teach the basic General Chemistry concepts, laws and phenomena with the scientific approaches.						
Learning Outcomes and Competences	On the basis of General Chemistry concepts and models thought during the course, the students will gain the problem solving abilities, to discuss them and to apply their knowledge to various chemical reactions.						
Textbook and /or References	General Chemistry: Principles and Modern Applications Authors: R.H. Petrucci, W.S. Harwood, F. G. Herring.						
Assessment Criteria						If any, mark as (X)	Percent (%)
	Midterm Exams					X	50
	Quizzes						
	Home works						
	Projects						
	Term Paper						
	Laboratory Work						
	Other						
	Final Exam						50
Instructors	Prof. Dr. Erdoğan HASDEMİR, Prof. Dr. Nurcan KARACAN, Prof. Dr. Serpil AKSOY, Prof. Dr. Semiha ÇAKIR, Prof. Dr. Tülin KIYAK, Prof. Dr. Bekir SARI, Prof. Dr. Tuncer ÇAYKARA, Assist. Prof. Dr. Hayrettin TÜMTÜRK,						
Week	Subject						
1	Fundamental concepts in Chemistry: Matter, element, compound, mole, mixture and some chemical concepts.						
2	Basic chemistry laws: Law of conservation of mass, law of constant composition, law of multiple proportions etc. Atomic and mole mass.						
3	Symbols, formulas, equations and compounds. Determination of empirical and molecular formulas.						
4	The oxidation state concept, describing and naming of chemical compounds. Chemical reactions and chemical equations,						
5	Stoichiometry. Oxidation-reduction reactions (redox).						
6	The periodic table and some atomic properties. Electronegativity, ionization energy, electron affinity, quantum numbers and electron orbitals.						
7	Gases: The simple gas laws, the ideal gas equation, kinetic theory of gases, nonideal (real) gases.						
8	Midterm exam						
9	Thermochemistry: Heat, heats of reaction and calorimetry. Chemical bonding: Basic concepts: Covalent and ionic bonding.						
10	Liquids, solids, and intermolecular forces.						
11	Solutions and their physical properties. Chemical equilibrium. Acids, bases and aqueous solution equilibrium.						
12	Thermodynamics: Some terminology, the laws of thermodynamics, Hess's law, Gibbs free energy.						
13	Electrochemistry: Faraday Laws, electrolysis, battery potential, Nernst equation.						

14	Organic Chemistry: Classification of organic compounds. Hydrocarbons (alkanes, alkenes and alkynes),
15	Alcohols, phenols, ethers, aldehydes and ketones. Carboxylic acids and their derivatives.

MAT-101 MATHEMATICS I					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Projects	Other	Total	Credit	ECTS Credit
1	60				40	100	4	6
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	None							
Course Contents	Numbers, equations and inequalities. Complex numbers. Functions: single-variable real functions, custom-defined functions, trigonometric functions, transantantal functions. Limits and continuity. Derivatives and applications. Indefinite integral and integration techniques. Definite integral. Applications of definite integrals: area, volume and arc length calculations. Improper integrals. Polar coordinates.							
Course Objectives	The aim of this course is to enable students to learn basic mathematics to Subject.							
Learning Outcomes and Competences	Students will have basic knowledge about specific topics such that numbers, functions, limits, derivatives and integrals .							
Textbook and/or References	Textbooks Fen- Mühendislik Fakülteleri ve Yüksek Okul Öğrencileri İçin Matematik Analiz ve Analitik Geometri, Ömer AKIN (Çeviri Editörü) Palme Yayıncılık. Assistant Textbooks Genel Matematik Cilt I, Mustafa Balcı, Balcı Yayınları.							
Assessment Criteria							<i>If any, mark as (X)</i>	Percent (%)
	Midterm Exams						x	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Numbers, equations and inequalities.							
2	Complex numbers							
3	single-variable real functions, custom-defined functions							
4	trigonometric functions							
5	transantantal functions							
6	Limits and continuity							
7	Limits and continuity							
8	Derivatives and applications.							
9	Midterm Exam							

10	Derivatives and applications.
11	Indefinite integral and integration techniques.
12	Definite integral.
13	Applications of definite integrals: area, volume and arc length calculations.
14	Applications of definite integrals: area, volume and arc length calculations.
15	Improper integrals. Polar coordinates.

EE-101 MATERIALS SCIENCE				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
1	30				70	100	2	3
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Mechanical behavior of materials: tensile test, stress-strain relations, brittle behavior, ductile behavior, shear effect, hardness. Physical properties of materials: specific gravity, water absorption, void ratio, permeability, capillary water absorption. Internal structure of materials: atomic structure, ionic bonding, covalent bonding, metallic bonding. Van der Waals bond, classification of materials. Crystalline structure: directions and planes, metals and ceramics. Crystal defects: point defects, planar defects. Non-crystalline materials: Glass, fluid, gas, phases. Solid solutions. Atomic diffusion. Strengthening mechanisms in metals, cold hardening, hot hardening, alloying, annealing, eutectic alloys, heat treatment, tempering. Creep, relaxation, fracture, and fatigue constitutive equations of materials. Electrical characteristic: Electrical conductor, semiconductor, dielectric characteristics, magnetic characteristics, optics characteristics, thermal characteristics.							
Course Objectives	Materials science and electrical equipment to have information about							
Learning Outcomes and Competences	Atomic structure, bonds between atoms, crystals and amorphous structures, and about the internal structure of materials such as electrical, mechanical, physical properties, such as to have information about the properties of materials							
Textbook and /or References	Prof. Dr. Kaşif Onaran, Malzeme Bilimi, Bilim Teknik Yayınevi. Prof. Dr. Kaşif Onaran, Malzeme Bilimi Problemleri ve Çözümleri, Bilim Teknik Yayınevi. Lawrence H. Van Vlack, Elements of Materials Science and Engineering, Literatür Yayıncılık Dağıtım Pazarlama San. ve Tic. Ltd. Şti. William F. Smith, Principles of Materials Science and Engineering, McGraw-Hill International Editions.							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week	Subjects							
1	Mechanical behavior of materials							
2	Physical properties of materials							
3	Internal structure of materials							
4	Crystalline structure							
5	Crystal defects							
6	Non-crystalline materials							
7	Strengthening mechanisms in metals							
8	Fatigue constitutive equations of materials.							
9	Midterm Exam							
10	Electrical characteristic, Electrical conductor							
11	semiconductor							
12	Electrical characteristics problem							
13	Dielectric characteristics							
14	Magnetic characteristics							
15	Optics and thermal characteristics.							

EE -103 Introduction to Electric and Electronic Engineering				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
1	30				70	100	2	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Fundamental of electric engineering, electric circuit, circuit component and basic laws, analysis techniques, alternating current circuit, multiphase systems, transient state. Electronics circuit, diode, transistor, operating amplifier, digital electronic.							
Course Objectives	To develop analyzing capability of students and preparing academics background of engineering courses							
Learning Outcomes and Competences	The student that took this lecture will gain proficiency of starting fundamental courses of electric electronic engineering.							
Textbook and /or References	4. John Bird, "Electrical and Electronic Principles and Technology", Newnes, 2nd edition , 2003 5. Ray Powell, "Introduction to Electric Circuits", Arnold, 1995 6. Arifoğlu Uğur, Elektrik Elektronik Mühendisliğinin Temelleri, Cilt-I-II Alfa Yay. İstanbul (2000).							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam						X	50	
Instructors								
Week	Subject							
1	Units associated with basic electrical quantities							
2	Introductions to electric circuits, quantity of electric and current, power, define of circuit components. Series and parallel networks,							
3	Resistance variations, Ohm's laws and their applications,							
4, 5	Chemical effect of electricity, electrolysis, internal resistance, accumulators,							
6, 7	Capacitors and capacitance, series and parallel networks.							
8	Magnetic circuits, magnetic fields, magnetic flux and flux density							
9	Electromagnetism, laws of electromagnetic induction							
10	Electromagnetism, electromagnetic induction							
11	Semiconductor materials, types of materials, The p-n junction							
12	Semiconductor diodes, The p-n junction							
13	Transistor, the bipolar junction transistor,							
14	Transistor, the bipolar junction transistor,							

ENF-102 COMPUTER PROGRAMMING					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
2	30		30			40	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Introduction, History of Computers. Main structure of computers, numerative system, binary codes. Arithmetic operations, Boolean algebras and applications. Central processing unit and main memory. Computer architecture and organisation. Input/output units, secondary memory units, computer software. Data structures, file and data base concepts. Programming and programming languages, program development and structural programming. Computer networks, internet and applications, computer security.								
Course Objectives	Give students all kinds of substructure about algorithm analysis and data structure models which neden in every mathematical model creation and data topics and to develop the best solution in related topic by using programming languages on the computer.								
Learning Outcomes and Competences	<ul style="list-style-type: none"> -Understanding the principles and stages necessary for solving a problem. -Making power schemes and algorism which is necessary for solving a problem -Understanding and using the structure of a programming language by using the programming language stated in the special aims part. 								
Textbook and /or References	<ul style="list-style-type: none"> • Computers, Capron and Johnson, 8th Ed., Prentice Hall. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	History of Computers								
2	Main structure of computers, numerative system, binary codes.								
3	Arithmetic operations								
4	Boolean algebras and applications								
5	Boolean algebras and applications								
6	Central processing unit and main memory								
7	Computer architecture and organisation								
8	Interm Exam								
9	Input/output units, secondary memory units, computer software								
10	Data structures, file and data base concepts								
11	Programming and programming languages								
12	Programming and programming languages								
13	program development and structural programming								
14	program development and structural programming								
15	Computer networks, internet and applications, computer security								

TAR-102 HISTORY OF PRINCIPLES AND REVOLUTIONS OF ATATURKS- II					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS Credit
2	30					70	100	2	2
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	None								
Course Contents	Modernization process of Turkey								
Course Objectives	To teach stages of establishment in modern Turkey								
Learning Outcomes and Competences	Having Knowledge about establishment of Turkish Republic and Ataturk								
Textbook and /or References	Books and articles in Turkish								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homework								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	National forces and fronts of Adana, Antep, Maraş, Urfa								
2	Establishment of uniform army and western front								
3	War of Sakarya and its results								
4	War of Commander chief domain and its results								
5	Agreement of Mudanya								
6	Conference of Lozan								
7	Enduring reign								
8	Establishment of Republic of Turkey								
9	Midterm Exam								
10	Progressive-mind Republican Party and Free Party								
11	Rebellion of Sheikh Sait and its results								
12	Revolutions								
13	Establishment of Intuitions of Turkish History and Turkish Language								
14	Principles of Ataturk								
15	Principles of Ataturk								

TÜR-102 TURKISH LANGUAGE - II					Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits		
	Lecture	Recite	Lab.	Project/Field Study	Homework	Other	Total	Credit	ECTS Credit	
2	30					70	100	2	2	
Language	Turkish Language									
Compulsory / Elective	Obligatory									
Prerequisites	N/A									
Course Contents	1. Sentence Structure, 2. Wordings, 3. Sentence and Sentence Composing Elements, 4. Sentence Types, 5. Sentence Analysis, 6. Sentence Inspection Examples, 7. Composition (In the Composition; Subject, Note and Keynote, Theme, Imagination, Paragraph), 8. Narration Types, 9. Creative, Fictional Writings, 10. Thought and Idea Transmitting Writings, 11. Formal Writings (Minutes, Announcements, Reports, Business Letters and CV), 12. Linguistic Faults (Writing and Punctuation Mark Faults, Expression Failures, Voice Based Faults), 13. Conference, 14. Scientific Research									
Course Objectives	To let students to gain usage skill of Turkish language, complying with its rules; best expression of feelings and thoughts in writing and oral; gaining and improvement of scientific, questioning, critical commenting, creative and constructive thinking habits.									
Learning Outcomes and Competences	To determine elements of the sentence and importance of these in order to establish an accurate, good and nice sentences; to be able to read and inspect writings related with literature and thoughts world and perform rhetoric applications; to identify written composition types and to perform applications related with these; realization of linguistic faults and to be able to correct these, to know and apply the rules, to be complied during issuance scientific writings. To improve accurate and better speaking, writing skills of the student on the basis of selected texts from Turkish and world literatures and thought history.									
Textbook and /or References	Yakıcı, Ali- Yücel, Mustafa- Doğan, Mehmet- Yelok, Veli Savaş; Üniversiteler İçin Türk Dili ve Kompozisyon Bilgileri, (Editör: Veli Savaş YELOK), Bilge Yayınları, Ankara, 2005.									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homework									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
Final Exam						X	50			
Instructors										
Week	Subject									
1	Sentence Structure, Wordings, Sentence and Sentence Composing Elements									
2	Sentence Types									
3	Sentence Analysis									
4	Sentence Inspection Examples									
5	Composition (In the Composition; Subject, Note and Keynote)									
6	Theme, Imagination, Paragraph									
7	Narration Types									
8	Midterm Exam									
9	Creative, Fictional Writings									
10	Thought and Idea Transmitting Writings									
11	Formal Writings (Minutes, Announcements, Reports, Business Letters and CV)									
12	Linguistic Faults (Writing and Punctuation Mark Faults)									
13	Linguistic Faults (Expression Failures, Voice Based Faults)									
14	Conference									
15	Scientific Research									

FIZ- 102 PHYSISC II				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
2	45	15	-		40	100	3	4
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Electric Charges and Coulomb Law, Concepts of Electric Field, Gauss Law and Its Applications, Electric Potential, Classification of Materials by Conductivity and Capacitors, Concepts of Current and Resistance, Direct Current Circuits, Concepts of Magnetic Field, Ampere's Law, Faraday's Law of Induction, Classification of Materials by Magnetism and Coils, RC, RL and RLC Circuits and Their Applications, Alternative Current, Electromagnetic Waves and Maxwell's Equations							
Course Objectives	Teaching the fundamental concepts and principles of physics in detail. Giving general knowledge to students about the laws of motion, Preparing the students to their own field courses by teaching the applications of physical principles to their field.							
Learning Outcomes and Competences	It is provided students with improvement in capability of solving basic concept of physics problem and analysing them.							
Textbook and /or References	Kemal Çolakoğlu (Çeviri Editörü) Palme Yayıncılık Fizik İlkeleri 1 Kemal Çolakoğlu (Çeviri Editörü) Palma Yayıncılık Fen ve Mühendislik için Fizik 1							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final					x	50	
Instructors								
Week	Subjects							
1	Electric Charges and Coulomb Law							
2	Concepts of Electric Field							
3	Gauss Law and Its Applications							
4	Electric Potential							
5	Classification of Materials by Conductivity and Capacitors							
6	Midterm Exam							
7	Concepts of Current and Resistance							
8	Direct Current Circuits							
9	Concepts of Magnetic Field							
10	Ampere's Law							
11	Faraday's Law of Induction							
12	Classification of Materials by Magnetism and Coils							
13	RC, RL and RLC Circuits and Their Applications							
14	Alternative Current							
15	Electromagnetic Waves and Maxwell's Equations							

MAT-102 MATHEMATICS II					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Projects	Other	Total	Credit	ECTS Credit
II	60				40	100	4	6
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites								
Course Contents	Sequences, convergence of sequences. Series, the convergence of series, power series, Taylor series. Multivariable functions. Limit, continuity, partial derivatives, chain rule, directional derivative, maximum and minimum, Lagrange multipliers method, Taylor series of multivariable functions. Two-and triple integrals, line integrals, Green's Theorem in the plane, the surface area and the surface integrals.							
Course Objectives	The aim of this course is to enable students to learn basic mathematics to Subject.							
Learning Outcomes and Competences	Students will have basic knowledge about specific topics such that sequences, series, multivariable functions, two-and triple integrals .							
Textbook and/or References	Textbooks Fen- Mühendislik Fakülteleri ve Yüksek Okul Öğrencileri İçin Matematik Analiz ve Analitik Geometri, Ömer AKIN (Çeviri Editörü) Palme Yayıncılık. Assistant Textbooks Genel Matematik Cilt I, Mustafa Balcı, Balcı Yayınları.							
Assessment Criteria							<i>If any, mark as (X)</i>	Percent (%)
	Midterm Exams						x	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Sequences, convergence of sequences							
2	Series, the convergence of series							
3	Power series, Taylor series							
4	Multivariate functions. Limit of multivariate functions.							
5	Limit, continuity, partial derivatives, chain rule, directional derivative of multivariate functions.							
6	Limit, continuity, partial derivatives, chain rule, directional derivative of multivariate functions.							
7	Directional derivative, maximum and minimum of multivariate functions.							
8	Lagrange multipliers method of multivariate functions.							
9	Midterm Exam							
10	Taylor series of multivariate functions.							
11	Two-and triple integrals							

12	Two-and triple integrals
13	line integrals, Green's Theorem in the plane
14	The surface area and the surface integrals.
15	The surface area and the surface integrals.

MAT-104 LINEAR ALGEBRA					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.	Projects	Other	Total	Credit	ECTS Credit	
2	45				55	100	3	5	
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	-								
Course Contents	Matrices, determinants and linear equations. Vector spaces, Inner product spaces, linear transformations. Eigenvalues and eigenvectors, diagonalization of symmetric matrix update.								
Course Objectives	The aim of this course is to teach students about the basic linear algebra.								
Learning Outcomes and Competences	Students will have basic knowledge about specific topics such that matrices, determinants and linear equations, vector spaces, inner product spaces, linear transformations. eigenvalues and eigenvectors, diagonalization of symmetric.								
Textbook and /or References	Textbooks Uygulamalı Lineer Cebir, Ömer AKIN (Çeviri Editörü) Palme Yayıncılık. Assistant Textbooks Linear Algebra, Fraleigh and Bearegard, Addison Wesley Publishing Company								
Assessment Criteria						<i>If any, mark as (X)</i>	Percent (%)		
	Midterm Exams					x		50	
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam					x		50	
Instructors									
Week	Subject								
1	Matrices								
2	Determinants								
3	Determinants								
4	Linear algebraic equations systems								
5	Vector spaces								
6	Inner product spaces								
7	Inner product spaces								
8	Linear transformations								
9	Midterm Exam								
10	Linear transformations								
11	Eigenvalues and eigenvectors								
12	Eigenvalues and eigenvectors								
13	Diagonalization of symmetric matrix								
14	Diagonalization of symmetric matrix								

IST-201 PROBABILITY AND RANDOM VARIABLES						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
3	45				55	100	3	3
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	Mathematics I, II							
Course Contents	Probability in Engineering, Basic Concepts, Definition of probability, Relative frequency approach, Random variables, Transformation of random variables, Multi-random variables, Response of linear systems, Applications of multi-random variables, Gauss and Poisson processes, Random processes, Time-based features, frequency-based features							
Course Objectives	To introduce basic concepts of randomness and probability and to teach the basic methodology to analyse random signal systems.							
Learning Outcomes and Competences	To enhance the ability of concepts of probability and randomness and to proceed the analysis of random signals.							
Textbook and /or References	Probability, Random Variables, and Random Signal Principles, Peebles, Jr., 4th Ed., McGraw-Hill Papoulis, A., Probability, Random Variables and Stochastic Processes, Mc Graw-Hill, 1991							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					X	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final					X	50	
Instructors								
Week	Subjects							
1	Introduction and definitions							
2	Joint and conditional probability. Bayes theorem. Independent events and Bernoulli trials.							
3	The random variable concept. Probability distribution and density functions. Conditional distributions and densities.							
4	Expected values, moments and characteristic functions.							
5	Transformations of a single random variable.							
6	Midterm Exam							
7	Multiple random variables, joint distribution and density functions.							
8	Limit theorems. Operations on multiple random variables.							
9	Definition of a random process. Independence and stationarity							
10	Time averages, statistical averages and ergodicity. Autocorrelation and cross-correlation functions.							
11	Gauss and Poisson processes							
12	Power spectrum and cross power spectrum. White and colored noise.							
13	White and colored noise							
14	Spectral Density							
15	Response of linear, time-invariant systems to random processes.							

MAT-201 ENGINEERING MATHEMATICS					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.	Projects	Other	Total	Credit	ECTS Credit	
3	60				40	100	4	6	
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	MAT-101, MAT-102								
Course Contents	First-order differential equations. Applications of first order differential equations. Second order differential equations. Applications of second order differential equations. Power series method; ordinary and regular points around Singular solutions. Laplace transformation; basic definitions and theorems, the solutions of initial value problems. Linear differential equation systems; basic theory and solutions, and Laplace transform solutions.								
Course Objectives	The aim of this course is to teach about the basic differential equations.								
Learning Outcomes and Competences	Students will have basic knowledge about specific topics such that matrices, first and second order solution of differential equations and applications, series solutions, Laplace transform.								
Textbook and/or References	Bilgisayar Destekli ve Matematiksel Modellemeli Diferensiyel Denklemler ve Sınır Değer Problemleri, Ömer Akın, Palme Yayıncılık. Uygulamalı Diferensiyel Denklemler Ders Notları, Nurettin Doğan.								
Assessment Criteria						<i>If any, mark as (X)</i>	Percent (%)		
	Midterm Exams					x		50	
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam					x		50	
Instructors									
Week	Subject								
1	First-order differential equations.								
2	First-order differential equations.								
3	First-order differential equations.								
4	Applications of first-order differential equations.								
5	Second-order differential equations.								
6	Second-order differential equations.								
7	Applications of second-order differential equations.								
8	Power series method; ordinary and regular points around Singular solutions.								
9	Midterm Exam								
10	Power series method; ordinary and regular points around Singular solutions.								
11	Laplace transformation; basic definitions and theorems								
12	The solution of initial value problems by using Laplace transform.								

13	The solution of initial value problems by using Laplace transform.
14	Linear differential equation systems; basic theory and solutions.
15	Laplace transform solutions.

ELK-201 CIRCUIT ANALYSIS I				Electrical and Electronics Engineering					
Term	Education and Teaching Methods							Credits	
	Theory	Appl.	Lab.	Summer Practice	Project/Field Study	Other	Total	Credit	ECTS Credits
3	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisite	No								
Catalog Information	Circuit elements and Laws. Independent and dependent sources. Analysis of resistive circuits. Circuit theorems. Circuit topology. The circuit including inductor and capacitor. Differential equations of electric circuits. Analysis of first and second order circuits. Laboratory experiments with related topics.								
Objectives	Purpose of this course is to build an understanding of concepts and ideas of circuit theory, so to developing students' problem-solving skills.								
Learning Outcomes	Students attended this course are able to analyse the electric circuit and solve the problem that faced by the application.								
References	<ol style="list-style-type: none"> Devre Analizi Dersleri, Yılmaz Tokad, İTÜ Müh. Fak. Yayınları, İstanbul. Electric Circuits, James W. Nilsson, Susan A. Riedel, Addison-Wesley Pub. Co. New York, 1996. 								
Evaluation criteria's								<i>Number</i>	<i>Percent (%)</i>
	Midterms							1	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							1	50
Content (%)	Mathematics and Basic Sciences							50	
	Engineering and Technological Sciences							50	
	Industrial Design and Production								
	Social Sciences								
Lecturers									
Week	Subject								
1	Circuit elements and Laws								
2	Independent and dependent sources								
3	Simplification of resistive circuits								
4	Mesh analysis								
5	Node analysis								
6	Süperposition, Thevenin, Norton and maximum power theorems								
7	Exam								
8	Circuit topology and analysis techniques								
9	Voltage and current relations of Inductor and capacitor, continuity of current and voltage								
10	Behaviour of circuits at t=0 and long time later in direct current								
11	Natural responses of first order circuits								
12	Step responses of first order circuits								
13	Natural and responses of second order circuits								
14	General overview								

EE- 205 ELECTRONICS-I				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
3	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Diodes and related applications, clippers and clampers. Reflectors, half-wave rectifiers, fullwave rectifiers, RC and LC filters, power supply design. Ripple and voltage regulation concepts. DC biasing to BJT and providing bias stability. DC biasing to FET and bias stability. Small signal analysis in one-stage amplifiers, amplifier modelling by using h parameters, analysing gain and other parameters for all amplifier types. Frequency response of amplifiers with BJT and FET.							
Course Objectives	<p>A student should acquire the following skills</p> <p>(a) Understand the operation and application of the basic electronic elements: diodes and transistors.</p> <p>(b) Perform AC/DC analysis on an electronic circuit</p> <p>(c) Understand the frequency response concept</p> <p>(d) Design voltage rectifier and voltage regulator circuits</p> <p>(e) Design a transistor amplifier (BJT or FET) for the given gain, input-output impedance and frequency response specifications</p>							
Learning Outcomes and Competences	Ability to explain the physical operation of electronic devices. Ability to discuss the DC and AC models of diodes and transistors. Ability to conduct experiments, as well as to analyze and interpret data.							
Textbook and /or References	<ol style="list-style-type: none"> 1. Electronic Devices-A Design Approach, Aminian A.,Kazimierczuk M. K., 2004, Prentice Hall 2. Elektronik Elemanlar ve Devre Teorisi, Boylestad R., Nashelsky L, 2003,Prentice-Hall, Türkçe Baskı Milli Eğitim Yayınevi 3. Electronic Principles, Malvino A. P., 1993, McGraw Hill 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Energy bands and charge carriers in semiconductors.							
2	Excess carriers in semiconductors							
3	P-N junction under equilibrium conditions. P-N junction under forward and reverse bias conditions							
4, 5	Transient and A-C conditions. Applications of p-n diodes.							
6, 7	Other p-n diodes. Metal semiconductor junctions							
8	Field-effect transistors. Junction field effect transistor. Midterm							
9	MOS field effect transistor							
10	Bipolar junction transistor (BJT). Minority carrier distributions and terminal currents in BJT							
11, 12	Switching of BJT, Optoelectronic devices: Photodiodes, LEDs							
13	Power devices: P-n-p-n diode, SCR and IGBT							
14	Negative conductance of microwave devices: Tunnel diode, IMPATT diode and Gunn diode.							
15	Introduction to integrated circuits							

EE -207 ELECTRONICS LAB-I					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
3			30		70	100	1	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Semiconductor diodes and rectifier circuits. Zener diodes and their regulator applications. Characteristics of bipolar junction transistors. Characteristics of junction field effect transistors. AC/DC analysis of BJT amplifiers. AC/DC analysis of JFET amplifiers. Frequency response of amplifiers with BJT and FET.							
Course Objectives	Upon successful completion of the course, the student learns the above topics and gains the ability to analyse an electric circuit. I. Introduction of Simulation Programs II. Diode Characteristics and their Rectifier Applications III. Zener Diode Characteristics and their Rectifier Applications IV. BJT Characteristics V. Review of Previous Studies VI. BJT Amplifier Applications VII. JFET Characteristics VIII. JFET Amplifier Applications IX. Project Work							
Learning Outcomes and Competences	Ability to explain the physical operation of electronic devices. Ability to discuss the DC and AC models of diodes and transistors. Ability to conduct experiments, as well as to analyze and interpret data.							
Textbook and /or References	<ol style="list-style-type: none"> 1. Electronic Devices-A Design Approach, Aminian A.,Kazimierczuk M. K., 2004, Prentice Hall 2. Elektronik Elemanlar ve Devre Teorisi, Boylestad R., Nashelsky L, 2003,Prentice-Hall, Türkçe Baskı Milli Eğitim Yayınevi 3. Electronic Principles, Malvino A. P., 1993, McGraw Hill 4. Integrated Electronics, Millman and Halkias, McGraw-Hill 5. Electronic Circuit Analysis and Design, Neamen, McGraw-Hill 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Energy bands and charge carriers in semiconductors.							
2	Excess carriers in semiconductors							
3	P-N junction under equilibrium conditions. P-N junction under forward and reverse bias conditions							
4, 5	Transient and A-C conditions. Applications of p-n diodes.							
6, 7	Other p-n diodes. Metal semiconductor junctions							
8	Field-effect transistors. Junction field effect transistor. Midterm							
9	MOS field effect transistor							
10	Bipolar junction transistor (BJT). Minority carrier distributions and terminal currents in BJT							
11, 12	Switching of BJT, Optoelectronic devices: Photodiodes, LEDs							

13	Power devices: P-n-p-n diode, SCR and IGBT
14	Negative conductance of microwave devices: Tunnel diode, IMPATT diode and Gunn diode.
15	Introduction to integrated circuits

EE -209 Digital System Design				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab	Project/Field Study	Other	Total	Credit	ECTS Credit
2	45			25	30	100	3	5
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	<p>Course contents are listed below:</p> <ul style="list-style-type: none"> - Elements and functions of digital logic. - Delay time power dissipation, noise immunity and loading considerations. - Analysis and design of combinational logic circuits. Universal gates. Minimization of combinational circuits. Karnaugh maps. - Adders, decoders, encoders, code converters, multiplexers and demultiplexers. - Error detection and correction, parity generators/checkers. - Hazards in combinational circuits. - Flip-Flops and multivibrators. Counters, shift registers, and memories. - Analysis and synthesis of synchronous sequential circuits. - RAM, ROM, PLA and PAL devices. 							
Course Objectives	Teaching the fundamental concepts and principles of digital design in detail. Giving general knowledge to students about the logic circuits, Preparing the students to their own field courses by teaching the applications of digital electronics principles to their field.							
Learning Outcomes and Competences	It is provided students with improvement in capability of solving digital design of electronic circuits and analysing them.							
Textbook and /or References	Digital Design 3rd ed. M. Mano, Prentice-Hall Logic and Computer Design Fundamentals, M.M.Mano and C.R.Kime, Prentice-Hall Digital Design: Principles and Practices, 4th ed., J.F.Wakerly, Prentice-Hall							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week	Subjects							
1	Numerical Logic elements and functions							

2	Delay timing, power consumption, noise immunity and installation issues
3	Analysis and design of combinational logic circuits
4	Universal logic gates
5	Minimization of combinational circuits
6	Mid term
7,8	Karnaugh maps, Adders, decoders, encoders, code converters, multiplexers and demultiplexers
9	Error detection and correction, , parity generators/checkers
10	Hazards in combinational circuits
11,12	Flip-Flops and multivibrators. Counters, shift registers, and memories.
13	Analysis and synthesis of synchronous sequential circuits
14	RAM, ROM, devices
15	PLA and PAL devices

EE -211 Digital System Design Lab.				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab	Project/Field Study	Other	Total	Credit	ECTS Credit
1			30		70	100	1	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Basic combinational circuit elements and their typical applications. Binary codes, decoders and encoders. Multiplexers and demultiplexers. Adders and subtractions Error detection and correction, hazards in combinational circuits. Flip-Flops, counters and shift registers. Sequence generators, pseudorandom sequence generators. Analysis and design of synchronous sequential circuits.							
Course Objectives	To apply the principles of combinational and sequential logic design learned in class to practical circuit design. And applications of lecture EE-209							
Learning Outcomes and Competences	It is provided students with improvement in capability of digital design problems and applications.							
Textbook and /or References	Digital Design 3rd ed. M. Mano, Prentice-Hall Logic and Computer Design Fundamentals, M.M.Mano and C.R.Kime, Prentice-Hall Digital Design: Principles and Practices, 4th ed., J.F.Wakerly, Prentice-Hall							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final					x	50	
Instructors								
Week	Subjects							
1,2	Basic elements and typical application examples of combinational circuits							
3,4	Binary codes, encoders and decoders							
5	Analysis and design of combinational logic circuits							
6	Mid term							
7,8	Adders, decoders, encoders, code converters, multiplexers and demultiplexers							
9,10	Flip-Flops and multivibrators. Counters, shift registers, and memories							

11	Sequence generators, random number generators
12	Parity generators/checkers
13	Analysis and synthesis of synchronous sequential circuits
14,15	RAM, ROM, PLA and PAL devices

ELK-202 CIRCUIT ANALYSIS II					Electrical and Electronics Engineering				
Term	Education and Teaching Methods							Credits	
	Theory	Appl.	Lab.	Summer Practice	Project/Field Study	Other	Total	Credit	ECTS Credits
4	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisite	No								
Catalog Information	Alternating currents. Steady-state analysis of sinusoidal alternating current circuits by using phasors. Frequency response. Polyphase circuits. s-domain analysis. State-spase analysis. .Laboratuary experiments with related topics.								
Objectives	Purpose of this course is to build an understanding concept and ideas of alternating current circuits, frequency domains so to developing students' problem-solving skills.								
Learning Outcomes	Students attended this course are able to analyse the alternating current electric circuit, to use frequency domains and solve the problem that faced by the application.								
References	3. Devre Analizi Dersleri, Yılmaz Tokad, İTÜ Müh. Fak. Yayınları, İstanbul. 4. Electric Circuits, James W. Nilsson, Susan A. Riedel, Addison-Wesley Pub. Co. New York, 1996.								
Evaluation criteria's								<i>Number</i>	Percent (%)
	Midterms							1	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							1	50
Content (%)	Mathematics and Basic Sciences							50	
	Engineering and Technological Sciences							50	
	Industrial Design and Production								
	Social Sciences								
Lecturers									
Week	Subject								
1	Periyodic currents and voltages, avarage and effective values								
2	Sinusoidal currents and voltages, phasors, empedance								
3	Frequency domain analysis of alternating current circuits								
4	Power and power factor in the alternating current circuits								
5	Mesh and nodal analysis of alternating current circuits								
6	Circuit theorems applications in the alternating current circuits								
7	Rezonance, magnetic coupled circuits								

8	Exam
9	Polyphase circuits
10	Mathematics of Laplace transform
11	s-domain analysis of circuits
12	State-space analysis
13	Fourier analysis
14	General overview

EE -206 ELECTRONICS-II				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
4	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Diodes and related applications, clippers and clampers. Reflectors, half-wave rectifiers, fullwave rectifiers, RC and LC filters, power supply design. Ripple and voltage regulation concepts. DC biasing to BJT and providing bias stability. DC biasing to FET and bias stability. Small signal analysis in one-stage amplifiers, amplifier modelling by using h parameters, analysing gain and other parameters for all amplifier types. Frequency response of amplifiers with BJT and FET.							
Course Objectives	<p>A student should acquire the following skills</p> <p>(a) Understand the operation and application of the basic electronic elements: diodes and transistors.</p> <p>(b) Perform AC/DC analysis on an electronic circuit</p> <p>(c) Understand the frequency response concept</p> <p>(d) Design voltage rectifier and voltage regulator circuits</p> <p>(e) Design a transistor amplifier (BJT or FET) for the given gain, input-output impedance and frequency response specifications</p>							
Learning Outcomes and Competences	Ability to explain the physical operation of electronic devices. Ability to discuss the DC and AC models of multi level operational amplifier. Ability to conduct experiments, as well as to analyze and interpret data.							
Textbook and /or References	<ol style="list-style-type: none"> 1. Electronic Devices & Circuit Theory, Boylestad and Nashelsky, 8th Ed., Prentice Hall 2. Integrated Electronics, Millman and Halkias, McGraw-Hill 3. Electronic Circuit Analysis and Design, Neamen, McGraw-Hill 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
Hafta	Konular							
1	Small signal analysis of BJT amplifiers: Input and output resistance; voltage, current and power gain							
2	Small signal analysis of FET amplifiers: Input and output resistance; voltage, current and power gain.							
3	Frequency responsivity of BJT amplifiers. Bode plots							
4	Frequency responsivity of FET amplifiers. Bode plots							
5	Multistage amplifiers: DC and AC analysis. Bode plots							
6,7	Constant current sources, Differential amplifiers: Differential and Common Mode of operation.							
8	Operational amplifier (OP amps) parameters Midterm Exam							
9	Linear applications of OP-AMPS.							
10	Nonlinear linear applications of OP-AMPS							
11,12	Power amplifiers (Class: A, AB, C operation). Transformer coupled amplifiers.							
13	Power supply using discrete components and OP amp.							
14	Feedback in amplifiers.							
15	Noise in amplifiers.							

EE- 208 ELECTRONICS LAB.-II					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
4			30			70	100	1	2
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Diodes and related applications, clippers and clampers. Reflectors, half-wave rectifiers, full wave rectifiers, RC and LC filters, power supply design. Ripple and voltage regulation concepts. DC biasing to BJT and providing bias stability. DC biasing to FET and bias stability. Small signal analysis in one-stage amplifiers, amplifier modelling by using h parameters, analysing gain and other parameters for all amplifier types. Frequency response of amplifiers with BJT and FET.								
Course Objectives	<p>A student should acquire the following skills</p> <p>(a) Understand the operation and application of the basic electronic elements: diodes and transistors.</p> <p>(b) Perform AC/DC analysis on an electronic circuit</p> <p>(c) Understand the frequency response concept</p> <p>(d) Design voltage rectifier and voltage regulator circuits</p> <p>(e) Design a transistor amplifier (BJT or FET) for the given gain, input-output impedance and frequency response specifications</p>								
Learning Outcomes and Competences	Ability to explain the physical operation of electronic devices. Ability to discuss the DC and AC models of multi stage operational amplifier. Ability to conduct experiments, as well as to analyze and interpret data.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Electronic Devices & Circuit Theory, Boylestad and Nashelsky, 8th Ed., Prentice Hall 2. Integrated Electronics, Millman and Halkias, McGraw-Hill 3. Electronic Circuit Analysis and Design, Neamen, McGraw-Hill 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
Hafta	Konular								
1	Small signal analysis of BJT amplifiers: Input and output resistance; voltage, current and power gain								
2	Small signal analysis of FET amplifiers: Input and output resistance; voltage, current and power gain.								
3	Frequency responsivity of BJT amplifiers. Bode plots								
4	Frequency responsivity of FET amplifiers. Bode plots								
5	Multistage amplifiers: DC and AC analysis. Bode plots								
6,7	Constant current sources, Differential amplifiers: Differential and Common Mode of operation.								
8	Operational amplifier (OP amps) parameters Midterm Exam								
9	Linear applications of OP-AMPS.								
10	Nonlinear linear applications of OP-AMPS								
11,12	Power amplifiers (Class: A, AB, C operation). Transformer coupled amplifiers.								
13	Power supply using discrete components and OP amp.								
14	Feedback in amplifiers.								
15	Noise in amplifiers.								

EE-210 SIGNALS AND SYSTEMS						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab	Project/Field Study	Other	Total	Credit	ECTS Credit
4	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	Circuit Analysis II							
Course Contents	Continuous and discrete-time signals and systems. Feedback, memory, stability, linearity, time-invariance, Linear and time-invariant systems described by differential or difference equations. Convolution. Fourier series and transformation. Modulation. Sampling. Z-transformation. Transfer functions.							
Course Objectives	Aim of this course is to teach the basic characteristics of time-dependent signals and systems and to explain the basic concepts of analysis of signals.							
Learning Outcomes and Competences	The students following that course learn the the discrete- time signals and the basic classifications of systems. The concepts of feedback, memory, stability, linearity, steady-state, fixed, the time-independent systems, the representations of differential and discrete equations, folding, Fourier series and transformations, modulation, sampling, z-transformation are learnt and the students can apply them to the real problems.							
Textbook and /or References	<ul style="list-style-type: none"> • A.V. Oppenheim, A.S. Willsky, S.H. Nawab, "Signals and Systems," Second Edition, Prentice-Hall, 1997. • S. Haykin and B. Van Veen, Signals and Systems, Wiley 1999. • H. Kayran ve E. M. Ekşioğlu, Bilgisayar Uygulamalarıyla Sayısal İşaret İşleme, Birsen Yay., 2004 • A.V. Oppenheim ve R.W. Schafer, Discrete-time Signal Processing, Prentice Hall, 1989 • E. Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, Inc., 1999 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final						x	50	
Instructors								
Week	Subjects							
1	Classification of signals and systems: Analog, digital, odd, even, continuous, periodic, energy and power							
2	Stability, memory, memoryless, causality, invertibility (simple cases), time invariance, linearity							
3	Stability, invertibility (simple cases), steady-state, sample problems							
4	Evaluate the convolution sum and integral given an input and the impulse response, the features of DTFS.							
5	Systems described by differential equations, features, distributive properties of convolution sum							
6	The systems described by discrete equations, iterative solution, impulse response, applications							
7	Laplace transformation, convergence features							
8	Other features of Laplace transform, inverse Laplace transform, usage of tables, partial fractions, system functions							
9	z-transform and discrete-time systems, convergence features, z-transform of some signals							
10	Inverse z-transform, usage of tables, power series, partial fractions, system functions							
11	Fourier series of periodic signals, Fourier transform, the relation between Fourier transform and Laplace transform							
12	Features of Fourier transform, Parseval's theorem, distortion-free transfer, filtering and filter types, bandwidth							
13	Discrete Fourier series, Fourier transform and features, frequency response of systems described by							

	difference equations
14	Sistemlerin örneklenmiş response to the continuous timesinusoids, simulation, applications
15	Problems and solutions

EE-212 ENGINEERING DRAWING AND DESIGN					Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits			
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit	
4	15	15				70	100	1	1	
Language	Turkish									
Compulsory / Elective	Compulsory									
Prerequisites	No									
Course Contents	Geometrical drawings, vertical projection principles, the interests of the appearance of three-dimensional models based on two main aspects to remove the third aspect, free-hand drawing techniques. Computer aided technical input image, three-dimensional drawing techniques: simple shapes, inclined surfaces, contrary surfaces. Scaling principles. Essential element of cross section: full, half sections, traditional applications. Screws, screw elements.									
Course Objectives	Ability to make two and three-dimensional drawing to succeed									
Learning Outcomes and Competences	Compasses, ruler, set square can be used as materials needed for drawing. Can draw three-dimensional cutaway view of the model. The computer can perform similar drawings. Size can do									
Textbook and /or References	1. Bertoline,Gary R.,AutoCAD for Engineering Graphics (İkinci Baskı) New York: Macmillan Publishing Company, 1994. 2. Giesecke,E.Frederick et. al., Technical Drawing (Onbirinci Baskı) Upper Saddle River, New Jerse:Prentice Hall, 2000.									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homeworks									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
Final Exam						X	50			
Instructors										
Week	Subject									
1	Geometric drawings									
2	Vertical projection principles									
3	Three-dimensional models based on the interests of the appearance									
4	Remove from the third appearance of the two main aspects									
5	Free-hand drawing techniques									
6	Computer aided technical input image									
7	Three-dimensional drawing techniques									
8	Simple shapes									
9	Curved surfaces									
10	Contrary surfaces									
11	Scaling principles									
12	Essential element of cross-section									
13,14	Full, half sections, traditional practices									
15	Screws, screw elements									

EE -214 ELECTROMAGNETIC FIELD THEORY I					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
5	30				70	100	2	3
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	Physics I-II, Mathematics I-II							
Course Contents	Field Concept, Electromagnetic model, vector analysis, coordinate systems, integrals of line, surface and volume, Nabla operator, Gradient, divergent, curl, static electric fields, Coulomb's Law, Gauss's Law, Materials in electric field, Electric potential, electrical work and energy, boundary-value problems, method of image charges, stable electric currents, current and current density							
Course Objectives	Basics concepts of electrostatics and stable electric currents and their applications are taught. Design and analysis of 1D-2D and 3D problems are given in accordance to improve the skills of vector analysis. Another objective is to improve the background for the usage of electric and magnetic softwares and techniques in order to solve the problems by the help of modern mathematical tools.							
Learning Outcomes and Competences	Participants acquire the understandings of gradient, divergent, curl operators together with line, surface and volume integrals. Theorems of divergents, Gauss and Stokes are learnt and the student can easily apply them to any physical and electrical system. Electrical forces among the charge densities can be found and the problems in Cartesian, cylindrical and spherical coordinates are learnt by the students. The skills to analyze the electrical systems with basic geometries in a dielectric material are enhanced. They learn to solve boundary-value problems in accordance with certain boundaries. The participants can also calculate the electric energy of charge densities. The problems including 1D Poisson and Laplace equalities can also be solved by the students taking this course.							
Textbook and /or References	<ol style="list-style-type: none"> 1. Gürdal, Osman, Elektromanyetik Alan Teorisi, Nobel Yayın Dagitim, Ankara, 2000 2. A Treatise on Electricity and Magnetism, Vol. 1-Vol. 2, James Clerk Maxwell, 1891, Oxford Press 3. David, Keun Cheng, Fundamentals of Engineering Elektromagnetics, Addison-Wesley Publishing Company, 4. Griffiths, David J., Introduction to Electrodynamics, Prentice-Hall Inc., 1991. 							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final					x	50	
Instructors								
Week	Subjects							
1	Introduction to electromagnetic field theory, field concept, vector analysis, scalar and vector fields, vector operations							
2	Cartesian, cylindrical and spherical coordinate systems							
3	Line, surface and volume differential elements, integrals of line, surface and volume							
4	Gradient, divergent, curl operations							
5	Divergent and Stokes theorems, Laplacian							
6	Green theorem, classification of fields							
7	Static electric fields, Coulomb's Law, electric field intensity, electric field of a charge density							
8	Electric flux, flux density, Gauss's Law, electric potential							
9	Electric dipoles, conductors in electric fields							
10	Interm Exam							
11	Dielectrics in electric field, stored energy in an electric field							
12	Boundary-value problems, capacitors and capacity, Poisson and Laplace equations							
13	Method of image charges, stable electric currents, current density, conduction and transportation currents							

14	Resistance concept, equation of continuity, Joule's Law
15	Electromotive force

EE-301 MICROCONTROLLERS-I					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Microcontroller based systems, microcontroller types, and comparison of microcontroller according to speed, cost, input-output ports and physical features. Application areas; control systems, instrumentation systems, communication systems. Software and software design for microcontroller based systems. Applications of flowcharts and Pseudo codes for microcontroller programs. Switches, LED's, motors, keypad, printer, ADC and DAC applications. Using programmable communication devices application for microcontroller based system design for industrial application. Choose device types for microcontroller application.								
Course Objectives	First of all microprocessor history how the microprocessors have evolved until today is given. Throughout the course the PIC microprocessors is thought .The initial objective is to teach the basic working principles of this CPU and related with this to introduce the bus structure that is found in any microcomputer. Then the memory structures are introduced where the bus is interfaced and address selection mechanism is given. With this the student will have a complete knowledge on how to integrate a memory to a CPU. Following this the Input Output devices are interfaced with the CPU to complete a full system. The different possible versions of how to interface I/O devices is also introduced here. In this way the student can be flexible to choose either one of different approaches while designing microcomputer systems. In order to program these systems the student learns to program in the Assembly language. In addition the interrupts are introduced to connect the PIC microprocessors to the external word in addition to using different techniques. Overall as a result the student will be equipped with enough knowledge to design a microcomputer system.								
Learning Outcomes and Competences	To give basic information about hardware and software of the microprocessors. To learn the design and programming of microprocessor controlled system. Ability to explain the physical operation of microcontroller device. Ability to improve the program models of electronic systems.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Introduction to Microprocessors and Microcontrollers, John Crisp, Elsevier, 2004. 2. Microprocessor Design: A Practical Guide from Design Planning to Manufacturing (Professional Engineering), Grant McFarland 3. Analog Interfacing to Embedded Microprocessor Systems, Second Edition (Embedded Technology Series) (Paperback), Stuart Ball, Elsevier. 4. Embedded Design with The PIC18F452 Microcontroller, John B. Peatman, 2003. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Microprocessor based systems.								
2	An introduction to the PIC microprocessor family.								
3	Software Architecture: Addressing Modes. An introduction to the programming. Programming applications.								
4, 5	Data transfer instructions. Arithmetic and Logical commands, Memory System Design. I/O system Design.								
6	Bit Manipulation, Program Transfer, and Processor Control Instructions.								
7	Midterm-I								

8,9	Hardware Architecture: Hardware details of the PIC 16F877.
10	Software and hardware interrupts.
11, 12	Timers and applications, to use seven segment displays and applications
13	Serial communications and applications
14	Structure of step motors and microcontroller applications
15	Design and building a working PIC system.

EE 303 MICROCONTROLLER-I LAB.				Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5			30			70	100	1	2
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Microcontroller based systems, microcontroller types, and comparison of microcontroller according to speed, cost, input-output ports and physical features. Application areas; control systems, instrumentation systems, communication systems. Software and software design for microcontroller based systems. Applications of flowcharts and Pseudo codes for microcontroller programs. Switches, LED's, motors, keypad, printer, ADC and DAC applications. Using programmable communication devices application for microcontroller based system design for industrial application. Choose device types for microcontroller application.								
Course Objectives	I. Data Transfer Operations II. I/O and Arithmetical/Logical Operations III. Program application of Logic Operations and Delay IV. Subroutines and subroutines applications. V. LCD and GLCD application VI. Timers, Interrupts and other applications Upon successful completion of the course, the student learns the above topics and gains the ability to implement a function using an PIC microprocessor.								
Learning Outcomes and Competences	To give basic information about hardware and software of the microprocessors. To learn the design and programming of microprocessor controlled system. Ability to explain the physical operation of microcontroller device. Ability to improve the program models of electronic systems.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Introduction to Microprocessors and Microcontrollers, John Crisp, Elsevier, 2004. 2. Microprocessor Design: A Practical Guide from Design Planning to Manufacturing (Professional Engineering), Grant McFarland 3. Analog Interfacing to Embedded Microprocessor Systems, Second Edition (Embedded Technology Series) (Paperback), Stuart Ball, Elsevier. 4. Embedded Design with The PIC18F452 Microcontroller, John B. Peatman, 2003. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Sample of Microprocessor based applications.								
2	Application of input- output port.								
3	Programming applications.								
4	Data transfer instructions. Arithmetic and Logical commands and applications.								
5	Bit Manipulation, Program Transfer, and Processor Control Instructions.								
6	Memory System Design. I/O system Design and application								
7	Midterm-I								
8	Timers and applications								
9	Software and hardware interrupts.								
10	To use seven segment displays and applications								
11	Serial communications and applications								
12	Structure of step motors and microcontroller applications								
13	Usage and applications of LCD and GLCD								

EE-321 Automation Systems					Electrical and Electronic Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project and Field Study	Other	Total	Credit	ECTS Credit
5,6	45			30	25	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Contactors, Magnetic and thermic circuit breakers, electro mechanic elements. Limit switches, relays, solenoids, time relays, thermostats, magnetic switches. DC machines and starting techniques of asynchronous motors. Control circuits. Starting and stopping of motors, braking, changing direction, speed control, multi-stage speed control, analysis of complex control circuits, ladder diagrams, flow charts, selection of suitable sensors. Drawing control and power circuits, designing various control circuits. Programmable logic controllers, (PLC) and controlling with them							
Course Objectives	Purpose of this course is to advance knowledge the students about electrical control circuit theory, classical control and PLC application.							
Learning Outcomes and Competences	Students attended this course are able to design and construct the electrical command circuits as classical method and PLC.							
Textbook and /or References	1. Electrical Command Circuits, İlhami Çolak, Ramazan Bayındır, Seçkin yayıncılık, 2004. (In Turkish) 2. Other PLC main source and application books							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						x	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Contactors, Magnetic and thermic circuit breakers, electro mechanic elements. Limit switches, relays, solenoids, time relays, thermostats, magnetic switches.							
2	Control circuits. Starting and stopping of motors, braking, changing direction, speed control, multi-stage speed control, analysis of complex control circuits, ladder diagrams, flow charts.							
3	Semiconductor circuits elements, features and connections. Limit-switch keys, position sensing.							
4, 5	1-phase and 3-phases motor control applications							
6	Visa exam.							
7, 8	Programmable logic controllers, (PLC) and motor controlling with them							
9	Motor control applications with PLC							
10	Inputs/outputs, counters, timers and memory organization							
11, 12	Comparator contacts, Move comments							
13	Analogue/Digital Converter, Real time clock, Interrupts,							
14	External module operations, sample applications							
15	Industrial networks, sample applications							

EE-323 Automation Systems Laboratory						Electrical and Electronic Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
5,6		30			70	100	1	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Applications of the “EE-321 Automation Systems” course will be realized.							
Course Objectives	Purpose of this course is to advance knowledge the students about electrical control circuit theory, classical control and PLC application.							
Learning Outcomes and Competences	Students attended this course are able to design and construct the electrical command circuits as classical method and PLC.							
Textbook and /or References	1. Electrical Command Circuits, İlhami Çolak, Ramazan Bayındır, Seçkin yayıncılık, 2004. (In Turkish) 2. Other PLC main source and application books							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						x	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Contactors, Magnetic and thermic circuit breakers, electro mechanic elements. Limit switches, relays, solenoids, time relays, thermostats, magnetic switches.							
2	Control circuits. Starting and stopping of motors, braking, changing direction, speed control, multi-stage speed control, analysis of complex control circuits, ladder diagrams, flow charts.							
3	Semiconductor circuits elements, features and connections. Limit-switch keys, position sensing.							
4, 5	1-phase and 3-phases motor control applications							
6	Visa exam.							
7, 8	Programmable logic controllers, (PLC) and motor controlling with them							
9	Motor control applications with PLC							
10	Inputs/outputs, counters, timers and memory organization							
11, 12	Comparator contacts, Move comments							
13	Analogue/Digital Converter, Real time clock, Interrupts,							
14	External module operations, sample applications							
15	Industrial networks, sample applications							

EE-363 DIGITAL ELECTRONICS LAB				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5			30			70	100	1	2
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Make students familiar with the usage of Electronic Workbench/PSpice circuit simulation software. Make them understand the usage of hardware description languages. Have them obtain a first hand experience about the topics of these systems through laboratory experiments and semester projects.								
Course Objectives	The objectives of this lecture are to give experimental knowledge of digital systems.								
Learning Outcomes and Competences	The student can be make simulation of digital systems via computer simulation programming and their applications.								
Textbook and /or References	1. Logic and Computer Design Fundamentals", M.Morris Mano, Charles Kime, Prentice Hall 2nd Edition, 2000 2. Chen, Wai-Kai, "Logic design", CRC Press, Boca Raton, Fla 2003								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Examining of registers and programmable logic device								
2	Flip-Flop circuit								
3	HDL-VHDL-Verilog languages.								
4, 5	HDL-VHDL-Verilog languages.								
6, 7	Programming of PLD's, PLA's, PAL's								
8	Programming of CPLD's, FPGA's								

9	Achieve of sum circuits.
10	Achieve of subtract circuits.
11	Design Example: Binary Multiplier
12	Decoder, Multiplexer,
13	Sequence Register
14	HDL Representation of the Binary Multiplier-VHDL-Verilog.

EE- 325 ELECTROMAGNETIC FIELD THEORY II						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
6	30				70	100	2	3
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	Physics I-II, Mathematics I-II, Electromagnetic Field Theory I							
Course Contents	Static magnetic fields, Biot-Savart's Law, Ampère's Law, Gauss's Law, magnetic circuits, Applications of static fields, time-dependent electromagnetic fields, motion-caused EMF, Faraday's induction law, Maxwell's equations, Self and mutual inductance, Energy from magnetic field, Applications of electromagnetic fields							
Course Objectives	To teach the basic concepts of magnetostatics. To introduce the applications of magnetostatics. Design and analysis of 1D-2D-3D problems and to improve the ability of vector analysis. Improvement of numerical and computational techniques on the solutions of magnetostatic problems by using modern mathematics and softwares. To teach the Maxwell's Equations.							
Learning Outcomes and Competences	The students can calculate the magnetic forces stemming from the currents and mathematical characteristics of magnetic problems can be understood for the coordinate systems of Cartesian, cylindrical and spherical. The effects of currents passing through a line, a surface and a volume can be understood with the mathematical explanations. The analysis of materials with a basic geometrical shape under the effect of a magnetic field is learnt. The physical basics of the integral and differential representations of Maxwell's equations are learnt and their principles can be applied for static and varying fields. Appropriate boundary conditions can be ascertained by students for a magnetic problem. Magnetic energies can be calculated for current distributions. The parameters of magnetic circuits can be calculated by the participating students.							
Textbook and /or References	1. Gürdal, Osman, Elektromanyetik Alan Teorisi, Nobel Yayın Dagitım, Ankara, 2000 2. A Treatise on Electricity and Magnetism, Vol. 1-Vol. 2, James Clerk Maxwell, 1891, Oxford Press 3. David, Keun Cheng, Fundamentals of Engineering Elektromagnetics, Addison-Wesley Publishing Company, 4. Griffiths, David J., Introduction to Electrodynamics, Prentice-Hall Inc., 1991.							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final					x	50		
Instructors								
Week	Subjects							
1	Introduction to static magnetic fields, Biot-Savart's Law, Ampère's Law							
2	Magnetic torque, Gauss's Law, Magnetic vector potential							
3	Magnetic field intensity, Ampere's circuit law							
4	Magnetic materials, ferromagnetism, scalar magnetic potential							
5	Boundary conditions, energy in magnetic field, linear and non-linear magnetic circuits							
6	Interm Exam							
7	Applications of static fields, magnetic deviation of charged particles, cathode tube oscilloscope, ink jet printer							
8	Seperation of minerals, electrostatic generator, electrostatic voltmeter, magnetic separator							
9	Hall's effect, electromagnetic pumping, Direct current motor							
10	Intro to time-dependent electromagnetic fields, motion-caused EMF, Faraday's induction law							
11	Maxwell's equations, self inductance, mutual inductance, inductance of coupled coils, magnetic energies of single and multiple coils							
12	Poynting's theorem, Periodic fields							
13	Transformer, auto-transformer							
14	Applications of electromagnetic fields							
15	Applications of electromagnetic fields							

ELEKTRONİK DALI DERSLERİ

EE-301 MICROCONTROLLERS-I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Microcontroller based systems, microcontroller types, and comparison of microcontroller according to speed, cost, input-output ports and physical features. Application areas; control systems, instrumentation systems, communication systems. Software and software design for microcontroller based systems. Applications of flowcharts and Pseudo codes for microcontroller programs. Switches, LED's, motors, keypad, printer, ADC and DAC applications. Using programmable communication devices application for microcontroller based system design for industrial application. Choose device types for microcontroller application.								
Course Objectives	First of all microprocessor history how the microprocessors have evolved until today is given. Throughout the course the PIC microprocessors is thought .The initial objective is to teach the basic working principles of this CPU and related with this to introduce the bus structure that is found in any microcomputer. Then the memory structures are introduced where the bus is interfaced and address selection mechanism is given. With this the student will have a complete knowledge on how to integrate a memory to a CPU. Following this the Input Output devices are interfaced with the CPU to complete a full system. The different possible versions of how to interface I/O devices is also introduced here. In this way the student can be flexible to choose either one of different approaches while designing microcomputer systems. In order to program these systems the student learns to program in the Assembly language. In addition the interrupts are introduced to connect the PIC microprocessors to the external word in addition to using different techniques. Overall as a result the student will be equipped with enough knowledge to design a microcomputer system.								
Learning Outcomes and Competences	To give basic information about hardware and software of the microprocessors. To learn the design and programming of microprocessor controlled system. Ability to explain the physical operation of microcontroller device. Ability to improve the program models of electronic systems.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Introduction to Microprocessors and Microcontrollers, John Crisp, Elsevier, 2004. 2. Microprocessor Design: A Practical Guide from Design Planning to Manufacturing (Professional Engineering), Grant McFarland 3. Analog Interfacing to Embedded Microprocessor Systems, Second Edition (Embedded Technology Series) (Paperback), Stuart Ball, Elsevier. 4. Embedded Design with The PIC18F452 Microcontroller, John B. Peatman, 2003. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Microprocessor based systems.								
2	An introduction to the PIC microprocessor family.								
3	Software Architecture: Addressing Modes. An introduction to the programming. Programming applications.								
4, 5	Data transfer instructions. Arithmetic and Logical commands, Memory System Design. I/O system Design.								

6	Bit Manipulation, Program Transfer, and Processor Control Instructions.
7	Midterm-I
8,9	Hardware Architecture: Hardware details of the PIC 16F877.
10	Software and hardware interrupts.
11, 12	Timers and applications, to use seven segment displays and applications
13	Serial communications and applications
14	Structure of step motors and microcontroller applications
15	Design and building a working PIC system.

EE 303 MICROCONTROLLER-I LAB.				Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5			30			70	100	1	2
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Microcontroller based systems, microcontroller types, and comparison of microcontroller according to speed, cost, input-output ports and physical features. Application areas; control systems, instrumentation systems, communication systems. Software and software design for microcontroller based systems. Applications of flowcharts and Pseudo codes for microcontroller programs. Switches, LED's, motors, keypad, printer, ADC and DAC applications. Using programmable communication devices application for microcontroller based system design for industrial application. Choose device types for microcontroller application.								
Course Objectives	I. Data Transfer Operations II. I/O and Arithmetical/Logical Operations III. Program application of Logic Operations and Delay IV. Subroutines and subroutines applications. V. LCD and GLCD application VI. Timers, Interrupts and other applications Upon successful completion of the course, the student learns the above topics and gains the ability to implement a function using an PIC microprocessor.								
Learning Outcomes and Competences	To give basic information about hardware and software of the microprocessors. To learn the design and programming of microprocessor controlled system. Ability to explain the physical operation of microcontroller device. Ability to improve the program models of electronic systems.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Introduction to Microprocessors and Microcontrollers, John Crisp, Elsevier, 2004. 2. Microprocessor Design: A Practical Guide from Design Planning to Manufacturing (Professional Engineering), Grant McFarland 3. Analog Interfacing to Embedded Microprocessor Systems, Second Edition (Embedded Technology Series) (Paperback), Stuart Ball, Elsevier. 4. Embedded Design with The PIC18F452 Microcontroller, John B. Peatman, 2003. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Sample of Microprocessor based applications.								
2	Application of input- output port.								
3	Programming applications.								
4	Data transfer instructions. Arithmetic and Logical commands and applications.								
5	Bit Manipulation, Program Transfer, and Processor Control Instructions.								
6	Memory System Design. I/O system Design and application								
7	Midterm-I								
8	Timers and applications								
9	Software and hardware interrupts.								
10	To use seven segment displays and applications								
11	Serial communications and applications								
12	Structure of step motors and microcontroller applications								
13	Usage and applications of LCD and GLCD								

EE- 361 Digital Electronics				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
5	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Give information about the operation principles, usage, design, and simulation techniques of memories, RAMs, ROMs, programmable logic devices, complex programmable logic devices (CPLD), field programmable gate arrays (FPGA), registers, data paths, sequencing and control, micro programmed control, instruction set architectures, CPU Designs, Input-Output and Communication, and Memory Systems.							
Course Objectives	Make the students understand the building blocks of digital systems.							
Learning Outcomes and Competences	The student that took this lecture will gain proficiency of digital system design and can be comment existing digital systems.							
Textbook and /or References	1. Logic and Computer Design Fundamentals", M.Morris Mano, Charles Kime, Prentice Hall 2nd Edition, 2000 2. Chen, Wai-Kai, "Logic design", CRC Press, Boca Raton, Fla 2003							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam							X	50
Instructors								
Week	Subject							
1	Memories and Programmable Logic Devices							
2	Memories, RAMs, RAM ICs, ROMs,							
3	Programmable Logic Devices (PLDs),							
4, 5	PLD's, PLAs, PALs, CPLDs, FPGAs							
6, 7	Register Transfers and Data paths: Data paths and Operations, Arithmetic/Logic/Shift Micro operations, Multiplexer-based Transfer, Bus-based Transfer, Three-State Bus, Memory Transfer, Data paths, Arithmetic Logic Unit (ALU), Shifter, Data path Representation, The Control Word, Pipelined Data path							
8	Sequencing and Control: The Control Unit, Algorithmic State Machines (ASM),							
9	ASM Charts, Timing Considerations,							
10	Design Example: Binary Multiplier, Hard Wired Control, Sequence Register and Decoder, One Flip-Flop per State, HDL Representation of the Binary Multiplier-VHDL-Verilog.							
11	Micro programmed Control: Binary Multiplier Example,							
12	A Simple Computer Architecture, Instructions.							
13	Instruction Set Architecture: Computer Architecture Concepts,							
14	Basic Computer Operation Cycle, Register Set, Operand Addressing, Three/Two/One/Zero-address.							

EE-361 Digital Electronics Lab.				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Homework	Other	Total	Credit	ECTS Credit
5			30		70	100	1	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Make students familiar with the usage of Electronic Workbench/PSpice circuit simulation software. Make them understand the usage of hardware description languages. Have them obtain a first hand experience about the topics of these systems through laboratory experiments and semester projects.							
Course Objectives	The objectives of this lecture are to give experimental knowledge of digital systems.							
Learning Outcomes and Competences	The student can be make simulation of digital systems via computer simulation programming and their applications.							
Textbook and /or References	1. Logic and Computer Design Fundamentals", M.Morris Mano, Charles Kime, Prentice Hall 2nd Edition, 2000 2. Chen, Wai-Kai, "Logic design", CRC Press, Boca Raton, Fla 2003							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Examining of registers and programmable logic device							
2	Flip-Flop circuit							
3	HDL-VHDL-Verilog languages.							
4, 5	HDL-VHDL-Verilog languages.							
6, 7	Programming of PLD's, PLA's, PAL's							
8	Programming of CPLD's, FPGA's							
9	Achieve of sum circuits.							
10	Achieve of substract circuits.							
11	Design Example: Binary Multiplier							
12	Decoder, Multiplexer,							
13	Sequence Register							
14	HDL Representation of the Binary Multiplier-VHDL-Verilog.							

EE- 365 ELECTROMAGNETIC WAVES						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
6	30				70	100	2	3
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	Physics I-II, Mathematics I-II							
Course Contents	Solution of static boundary value problems in different coordinate systems, time-varying fields, Maxwell's equations and boundary conditions, Potential functions, Wave equations and their solutions, Plane waves and their propagation in different media, Flow of electromagnetic power, poynting vector, Reflections and refraction of plan waves at plane interfaces							
Course Objectives	To recognize boundary value problems and build the skills to form their solutions. To understand the Maxwell's equations and to be able to use them together with boundary conditions. To be able to find fields using potential functions. To be able to form simple solutions of wave equation. To investigate the propagation, reflection and refraction of plane waves. To be able to calculate the flow of electromagnetic power. To understand introductory transmission line concepts.							
Learning Outcomes and Competences	The participating students can recognize boundary value problems and build the skills to form their solutions. The Maxwell's equations are learnt and the students can use them together with boundary conditions. Fields can be found from the potential functions. Simple solutions of wave equation can be calculated. The propagation, reflection and refraction of plane waves are learnt. The calculation of flow of electromagnetic power is learnt. The basic principles of communication can be understood.							
Textbook and /or References	<ul style="list-style-type: none"> • Field and Wave Electromagnetics, Cheng, 2nd Ed., Addison Wesley • Electromagnetic Fields and Waves, Lorrain, Corson, 2nd Ed., Freeman • Fundamentals of Engineering Electromagnetics, Cheng, David K. 1992;, Addison-Wesley. • Electromagnetic Waves and Radiating Systems, Jordan, Balmain, 2nd Ed., Prentice Hall • Introductory Engineering Electromagnetics, Popovic, Addison Wesley • Schaum's Outline Series in Electromagnetic 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final						x	50	
Instructors								
Week	Subjects							
1	Faraday's induction law and transformers							
2	Maxwell's equations and electromagnetic boundary conditions							
3	Wave equations and solution techniques							
4	Periodic fields and features of electromagnetic spectrum							
5	Undamped plane waves and Doppler's effect							
6	Transverse electromagnetic waves and polarisation of plane waves							
7	Damped plane waves							
8	Interm Exam							
9	Power flux and Poynting vector							
10	Perpendicular incoming of waves to the boundaries of planes							
11	Inclined incoming of waves to the boundaries of planes							
12	Perpendicular polarisation, parallel polarisation, Brewster's angle							
13	Wave-guide structures							
14	Transverse magnetic waves, transverse electric waves							
15	Electromagnetic radiation							

EE-401 CONTROL SYSTEMS-I					Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits			
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit	
7	45					55	100	3	3	
Language	Turkish									
Compulsory / Elective	Compulsory									
Prerequisites	No									
Course Contents	Historical overview of control systems, basic concepts of open loop and closed loop, feedback. Models of physical systems: electrical components, mechanical systems, fluid systems, thermal systems, servomotors. Block diagrams, signal-flow graphs. State-space description, state transitions matrix, companion form, diagonalization of A matrix, transfer function decomposition. Time response analysis, s-plane, steady-state error analysis. Sensitivity, disturbance rejection and stability analysis, Routh-Hurwitz criterion, root-locus plotting. Frequency response analysis: Bode, polar and magnitude-phase plots, Nyquist analysis, gain/phase margins, Nichols chart.									
Course Objectives	To provide students with background needed for basic control systems. System principles linking transfer function or stability are understood by students									
Learning Outcomes and Competences	Open or closed loop system transfer function of the extraction ability wins. Transfer function analysis to make certain the stability of the system learns. Bode, Nyquist and root locus analysis can be drawing on the computer									
Textbook and /or References	<ol style="list-style-type: none"> Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley Modern Control Engineering, Ogata, 4. Ed, Prentice Hall 									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homeworks									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
	Final Exam						X	50		
Instructors										
Week	Subject									
1	Historical overview of control systems									
2	Basic concepts of open loop and closed loop, feedback.									
3,4	Models of physical systems: electrical components, mechanical systems, fluid systems, thermal systems, servomotors.									
5	Block diagrams									
6,7	Signal-flow graphs.									
8,9	State-space description, state transitions matrix, companion form, diagonalization of A matrix, transfer function decomposition.									
9	Time response analysis, s-plane, steady-state error analysis.									
10,11	Sensitivity, disturbance rejection and stability analysis, Routh-Hurwitz criterion, root-locus plotting.									
12, 13	Frequency response analysis: Bode, polar and magnitude-phase plots									
14,15	Nyquist analysis, gain/phase margins, Nichols chart.									

EE-403 CONTROL SYSTEMS LAB.-I					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7			30			70	100	1	1
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Input and output transducers (position, temperature, pressure, flow rate, humidity, speed, acceleration, light level, sound level). Signal conditioning circuits (comparator, amplifier and converter circuits). Display devices. Basic on/off control systems. Speed control systems. Temperature control systems. Obtaining frequency responses experimentally. Using computer softwares in obtaining the time responses of control systems.								
Course Objectives	Measuring element to understand the signal conversion. Open and closed loop systems feedback to learn the elements. Measuring and control elements to model computer								
Learning Outcomes and Competences	Information obtained from the sensor current, voltage or frequency as the ability to convert wins. The resulting signal processing skills wins. Speed and temperature control system learns. The information learned will make a computer simulation studies.								
Textbook and /or References	<ol style="list-style-type: none"> 1. Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill 2. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 3. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 4. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Position sensors and signal conversions								
2	Temperature sensors and signal conversions								
3	Pressure sensors and signal conversions								
4	Flow rate and humidity sensors and signal conversions								
5	Speed and acceleration sensors and signal conversions								
6	Light and sound sensors and signal level conversions								
7,8	Comparator, amplifier and converter circuits								
9	Imaging devices								
10	Basic open / close control systems								
11	Speed control systems								
12	Temperature control systems.								
13	As to obtain the experimental frequency response								
14,15	Control systems reaction time to obtain the use of computer software.								

EE-421 Electric Machines I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
7	45					55	100	3	4
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Structures and operational principles of magnetic field, magnetic field sources, magnetic circuits, transformers; one phase transformers, multy phase transformers, autotransformers, and special transformers. Connection of transformers and determining their polarities. Principles of electro mechanic energy conversion and its dynamic equations. Structure of DC machines and their operation principles. Study state analyses of DC machines and their control and studens learns to make welding machines and transformotors.								
Course Objectives	The objectives of this lectur are to give therotical and experimental knowlages of magnetic field, transformers, electro mechanic energy conversion and DC machines to students.								
Learning Outcomes and Competences	Students attended this course are able to analyse and perform experimental study and theoretical knowledge about the magnetic field, transformers, electro mechanic energy conversion and DC machines.								
Textbook and /or References	<ul style="list-style-type: none"> •1. GÜNGÖR BAL, Doğru Akım Makinaları ve Sürücüleri •2. GÜNGÖR BAL, Transformatörler 3. G.R.Slemon, Electric Machines and Drives, Addison Wesley 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Electromagnetic field theory and electromagnetic field sources.								
2	Electromagnetic circuits.								
3	Transformotors.								
4, 5	Single phase, three phases, oto and special transformotors, constructions, study prensibles.								
6	Transformotors connections and connections samples.								
7	Polarity finding and coil connections.								
8	Transformotors parallel connections conditions and parallel connections.								
9	Transformotors losses, short circuit voltage percent, regulation and efficiency								
10	Elektromechanic energ changing prienciples.								
11	Elektromechanic energ changing dynamic equations.								
12	Direct current machines constructions.								
13	Direct current machines study prienciples and performances.								
14	Stable state Analysis and controls of Direct current machines								

EE-425 Power Electronics-I				Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.	Project		Total	Credit	ECTS Credit	
7	45			15	40	100	3	4	
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Introduction; Power semiconductors; Power losses in power semiconductors and calculations; Cooling in power semiconductors; Basics of Fourier analysis; RLC circuits; Single and three phase controlled/uncontrolled rectifiers; Effects of non-ideal commutation, line current harmonics, input power factor, utility factor, transformer kVA ratings in rectifiers; Four quadrant operation of rectifiers; AC voltage regulators; DC-DC converters (buck, boost, buck-boost, cuk sepic), design and analysis.								
Course Objectives	This course is designed to equip students with knowledge about basic concepts of power semiconductors, single and three phase rectifiers, DC-DC converters and design steps of these circuits								
Learning Outcomes and Competences	To obtain the information about to power semiconductors, design and analysis of single and three phase rectifiers and DC-DC converters								
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 								
Assessment Criteria							If any, mark as (X)	Percent (%)	
	Midterm Exams						X	50	
	Quizzes								
	Home works								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam						x	50	
Instructors									
Week	Subject								
1	Introduction; Power semiconductors switches								
2	Power losses of semiconductors and calculations								
3	Cooling in power semiconductor switches Güç yarı iletkenlerinin soğutulması; Doğrultucularda ideal olmayan komütasyon etkisi, harmonikler, giriş güç faktörü, faydalanma (utility) faktörü, transformatörlerin kullanım oranı; Doğrultucunun dört çeyrek çalışması; AA gerilim regülatörleri;								
4	Effects of non-ideal commutation, line current harmonics, input power factor, utility factor, kVA rations of transformers in rectifiers.								
5	Basics of Fourier analysis								
6	Single phase uncontrolled rectifiers								
7	Three phase uncontrolled rectifiers								
8	Single phase controlled rectifiers								
9	Three phase controlled rectifiers								
10	Four quagrant operation of rectifiers; AC voltage regulators								
11	DC-DC converters								
12	Buck converters, analysis and design								
13	Boost converters, analysis and design								
14	Buck-boost, cuk, sepic converters, analysis and design;PWM generation in DC-DC converters								
15									

EE-427 Power Electronics Lab.-I				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7.			30		70	100	1	2
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Single phase half wave diode rectifier, Single phase full wave diode rectifier, Three phase half wave diode rectifier, Three phase full wave diode rectifier, Single phase half wave thyristor rectifier, Single phase full wave thyristor rectifier, Three phase half wave thyristor rectifier, Three phase full wave thyristor rectifier, Single phase AC voltage regulator, Three phase AC voltage regulator, Buck converter, Boost converter, Buck-Boost converter, Cuk converter, sepic converter experiments.							
Course Objectives	This course is designed to equip students with practical knowledge of basic concepts of power semiconductors, single and three phase rectifiers and DC-DC converters							
Learning Outcomes and Competences	To obtain the practical information about to power semiconductors, design and analysis of single and three phase rectifiers and DC-DC converters							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Single phase half/full bridge uncontrolled rectifier experiment,							
2	Three phase half bridge uncontrolled rectifier experiment,							
3	Three phase full bridge uncontrolled rectifier experiment,							
4	Single phase half bridge controlled rectifier experiment,							
5	Single phase full bridge controlled rectifier experiment,							
6	Three phase half bridge controlled rectifier experiment,							
7	Three phase full bridge controlled rectifier experiment,							
8	Single phase AC voltage regulator experiment,							
9	Three phase AC voltage regulator experiment,							
10	Buck converter experiment,							
11	Boost converter experiment,							
12	Buck-Boost converter experiment,							
13	Cuk converter experiment,							
14,15	Sepic converter experiment.t							

EE-429 Power System Analysis					Electrical and Electronic Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Introduction to power systems, Differences between the 1-phase and the 3-phases systems, functions, Transmission line calculations, Modelling of power systems, Matrix analysis of power systems and solution methods, Power flow and performance specifications, Voltage and current profiles, Losses and productivity, Symmetrical components theory, Positive, negative and Zero component circuit, Symmetrical short-circuit analysis, Unsymmetrical short-circuit analysis, Harmonic losses in power systems, Transient and steady-state analysis of power systems.							
Course Objectives								
Learning Outcomes and Competences								
Textbook and /or References	1. Elements of power system analysis: William D. Stevenson, J .McGraw-Hill, 1982 ISBN: 0-07-061278-1							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						x	50
	Quizzes							
	Homeworks							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						X	50
Instructors								
Week	Subject							
1	Introduction to power systems, Differences between the 1-phase and the 3-phases systems, functions,							
2	Transmission line calculations, Modelling of power systems,							
3,4	Matrix analysis of power systems and solution methods							
5	Power flow and performance specifications,							
6	Visa exam.							
7	Voltage and current profiles, Losses and productivity							
8,9	Symmetrical components theory, Positive, negative and Zero component circuit,							
10	Symmetrical short-circuit analysis,							
11, 12	Unsymmetrical short-circuit analysis,							
13	Harmonic losses in power systems,							
14,15	Transient and steady-state analysis of power systems.							

EE-435 Power System Dynamics and Stability				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab	Project/Field Study	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Selective							
Prerequisites	No							
Course Contents	Stability Definitions; Simulation Methods; a Machine System Stability, Oscillation Equations; Equal Area Criterion; Multi-Machine System Stability; Mathematical Model of Synchronous Machine; Phase Models (d-q-0) Model; State Space Model; warning and Mechanical Input System Models; Stability Analysis							
Course Objectives	In this course, students, electric power system dynamics and stability of knowledge on the subject intended to be comprehensive.							
Learning Outcomes and Competences	Approaches used in the analysis of power systems may use these systems operate in a stable manner required for planning and control design will be able to perform.							
Textbook and /or References	<p>Advanced Power System Analysis and Dynamics, L.P. Singh, New Age Int., 2006.</p> <p>Power System Dynamics and Stability, Jan Machowski, Janusz Bialek, James Bumby, John Wiley & Sons, 1998.</p> <p>Power system dynami , K. R. Padiyar, Anshan, 2004</p>							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final					x	50		
Instructors								
Week	Subjects							
1	Stability Definitions							
2	Simulation Methods							
3	Machine System Stability							
4	Oscillation Equations							
5	Equal Area Criterion							

6	Mid term
7,8	Multi-Machine System Stability
9	Mathematical Model of Synchronous Machine
10	Phase Models
11,12	(d-q-0) Model
13	State Space Model
14	Warning and Mechanical Input System Models
15	Stability Analysis

EE-402 CONTROL SYSTEMS II					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Design considerations: PID control, phase-lead and phase-lag compensator design on rootlocus and Bode plots. Compensation in frequency-domain. State-space representation. Eigenvalues and eigenvectors. Linear transformation. Solution techniques. Controllability and observability. Liapunov's method. Phase plane analysis. Pole assignment. Observer design. Introduction to optimal control. Analysis and design of discrete-time systems. Application examples.								
Course Objectives	PID controller design and the accuracy of the students analyze their skills to provide. Systems can be controlled or can be observed to ensure that their learning.								
Learning Outcomes and Competences	PID control elements impact the root locus of the system or by drawing lines bode sets. Systems that detect auditable or observable. Continuous and discrete-time control system learns the difference.								
Textbook and /or References	1. Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill 2. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 3. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 4. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1,2	PID control								
3,4	Root locus and Bode drawings								
3	Defined in the frequency compensation								
4, 5	In state space modeling								
6, 7	Concepts of eigenvalues and eigenvectors								
8	Linear transformations								
9	Controllability and observability. Liapunov method								
10	Situation analysis plane. Pole assignment								
11, 12	Observer design								
13	Optimal control log								
14,15	Discrete-time control systems analysis and design								

EE-404 CONTROL SYSTEMS LAB II					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit

8		30		70	100	1	1
Language	Turkish						
Compulsory / Elective	Compulsory						
Prerequisites	No						
Course Contents	Position and velocity control systems. PID controller design in control system. Using computer softwares in obtaining root locus and frequency responses of control systems. Root locus and frequency response designs of phase lead, phase lag and PID controllers using computer softwares.						
Course Objectives	PID controller design to ensure the learning						
Learning Outcomes and Competences	Comprehend the PID design. Develop skills in computer simulation. Design solutions to problems arising in the ability to produce wins						
Textbook and /or References	1. Linear Control Systems: Analysis and Design, D’Azzo, Houpis, 4. Ed., McGraw-Hill 2. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 3. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 4. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall						
Assessment Criteria						If any, mark as (X)	Percent (%)
	Midterm Exams					X	50
	Quizzes						
	Homeworks						
	Projects						
	Term Paper						
	Laboratory Work						
	Other						
Final Exam					X	50	
Instructors							
Week	Subject						
12	Position control systems						
3,4	Speed control systems						
5,6	The design of PID controllers in control systems						
7,8,9	Root locus and frequency response of the control system to obtain the use of computer software						
10,11,12	Computer software using phase shifting, phase delay						
13,14,15	Root locus and frequency response of the PID controller designs						

Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	4
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Occur of magnetic fields and three phase windings, working principles of induction machine, Inducing MMF and torque, equivalent circuit in induction machine. Operation mode of induction machine motor, generator and break, analysis of steady state, Speed control of asynchronous machine. One phase asynchronous machine, Construction of synchronous machines, excitation fields and their Fourier analysis, two-axis theory of salient-pole machines, reactances, armature reaction in synchronous generators and motors, equivalent circuits, characteristics at no-load and full load condition, phasor diagrams, short-circuit ratio, short-circuit current, synchronization, starting of synchronous motors, active and reactive power regulation, excitation methods, torque equations.								
Course Objectives	Alternating current motor of the working principles of understanding and analysis be done								
Learning Outcomes and Competences	Students who successfully complete this course, alternating current machines learn the features and connections.								
Textbook and /or References	<ul style="list-style-type: none"> •1. Chapman , “Electric Machinery Fundamentals”, , 3rd Ed., McGraw-Hill •2. Fitzgerald, Kingsley, Umans, “Electric Machinery”, 5th Ed., McGraw-Hill 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Occur of magnetic fields.								
2	Operation principles of induction machine								
3	Inducing MMF and torque, equivalent circuit in induction machine								
4, 5	Operation mode of induction machine motor, generator and break, analysis of steady state,								
6	Speed control of induction machine.								
7	One phase asynchronous machine.								
8	Construction of synchronous machines, excitation fields.								
9	Fourier analysis of synchronous machines								
10	Reactances, armature reaction in synchronous generators and motors								
11	Equivalent circuits of synchronous machines								
12	Characteristics at no-load and full load condition, phasor diagrams of synchronous machines								
13	Short-circuit ratio, short-circuit current, synchronization, starting of synchronous motors								
14	Active and reactive power regulation, excitation methods, torque equations in synchronous machines.								
EE -423 Electric Machines Laboratory I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8			30			70	100	1	2
Language	English								
Compulsory / Elective	Compulsory								

Prerequisites	No		
Course Contents	Experiments of asynchronous machine (examine and find to no load conditions, locked (short circuit) study, full load study, slip, speed control, asynchronous generator, and wound rotor asynchronous machine study instead of synchronous machine). Experiments of synchronous machine (yield operated synchronous machine, synchronous machine's V curves, parallel connection of synchronous machines, short circuit characteristic of synchronous machine, no load characteristic of synchronous machine, adjustment characteristic of synchronous machine, examine to terminal voltage so far as load conditions)		
Course Objectives	Alternating current operation of electrical machines to learn. Connections made.		
Learning Outcomes and Competences	Students who successfully complete this course, asynchronous and synchronous machines, features and connect to learn.		
Textbook and /or References	<ul style="list-style-type: none"> •1. GÜNGÖR BAL, Doğru Akım Makinaları ve Sürücüleri •2. GÜNGÖR BAL, Transformatörler 3. G.R.Slemon, Electric Machines and Drives, Addison Wesley 		
Assessment Criteria		If any, mark as (X)	Percent (%)
	Midterm Exams	X	50
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	50
Instructors			
Week	Subject		
1	Locked rotor test in the no load operating of Induction machine.		
2	Load test in Induction machine		
3	Find to slip in Induction machine		
4, 5	Burden by type of alternator voltage change ends investigation		
6, 7	Alternator set of characteristics		
8	Saturation characteristics of the alternator installed		
9	No load characteristics of alternator. i		
10	Short circuit characteristics		
11	Alternator's connected parallel		
12	Synchronous motor to give way to test		
13	V curves of synchronous motor		
14	As the synchronous motor winding rotor asynchronous motor running		

EE-426 Power Electronics-II		Electrical and Electronics Engineering	
Semester	Teaching Methods	Credits	

	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8.	45				55	100	3	4
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Switch mode power supplies, Introduction to inverters, Square wave and stepped wave inverters, Sinusoidal and space vector PWM generation methods, Single and three phase voltage source inverter, Voltage regulation, Harmonics, Output filter design, Current source inverters, Uninterruptible power supplies, High voltage DC transmission, Static VAR compensation, Protection methods for semiconductor switches, Thermal factors and design of cooling plate, Snubber design, Serial and parallel connection of semiconductor switches.							
Course Objectives	This course is designed to equip students with knowledge about basic concepts and design methods of _____, inverters and PWM generation methods, uninterruptible power supplies and static VAR compensation systems.							
Learning Outcomes and Competences	To obtain the information about _____, inverters and PWM generation methods, uninterruptible power supplies and static VAR compensation systems.							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university press 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Switch mode power supplies,							
2	Introduction to Inverters,							
3	Square wave and stepped wave inverters,							
4	Sinusoidal and space vector PWM generation,							
5	Single and three phase voltage source inverters,							
6	Voltage regulation; Output voltage harmonics; Inverter output filter design,							
7	Current source inverters,							
8	Uninterruptible power supplies,							
9	High voltage DC transmission,							
10	Static VAR compensation,							
11	Protection methods of semiconductor switches,							
12	Thermal _____,							
13	Snubber circuit design,							
14								

EE-428 Power Electronics Lab.-II				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8.			30		70	100	1	2
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Switch mode power supplies, Square wave inverter, 12 step inverter, single phase bipolar and unipolar PWM generation, Space vector PWM generation, Single phase voltage source inverter, Three phase voltage source inverter, Design of inverter output filter, Single phase current source inverter, Three phase current source inverter, Snubber circuits, Serial and parallel connection of semiconductor switches experiments.							
Course Objectives	This course is aimed to teach practical knowledge about the, single and three phase inverters and PWM generation methods, uninterruptible power supplies and static VAR compensation systems.							
Learning Outcomes and Competences	To obtain the practical information about to, single and three phase inverters and PWM generation methods, uninterruptible power supplies and static VAR compensation systems.							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam						x	50	
Instructors								
Week	Subject							
1	Switch mode power supply experiments,							
2	Single phase square wave inverter experiment,							
3	6 step three phase inverter experiment, 6 step three phase inverter experiment,							
4	1 phase bipolar and unipolar PWM generation experiments, 3 phase sinusoidal PWM generation experiments,							
5	Space vector PWM generation experiment,							
6	Single phase voltage source inverter experiment,							
7	Three phase voltage source inverter experiment,							
8	Examining the inverter output filter,							
9	Single phase current source inverter experiment,							
10	Three phase current source inverter experiment,							
11	Examining the effects of Snubber circuits,							
12	Parallel connection of power semiconductor switches,							
13	Examining the uninterruptible power supplies,							
14,15	Static VAR compensation experiment.							

EE- 430 Energy Transmission -II-					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4	8
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Electrostatic Fields: basic electrode systems, approximate calculation of maximum electric field strength, electrode systems with multi-dielectrics, conformal mapping, numerical methods for electrostatic field calculations. Introduction to discharge phenomena: discharge phenomena in gases (Townsend and streamer theories); corona, lightning and surface discharges, discharge phenomena in solid and liquid dielectrics. Fundamentals of overvoltages and overvoltage protection. Generation and measurement of high voltages								
Course Objectives	Belong in different disciplines to gather and evaluate data and information. Improve the ability to work as a team. To recognize basic equipment, selection and testing .								
Learning Outcomes and Competences	Ability to apply knowledge of basic science and engineering, Active participation in collective work, the ability to win division of labor discipline , the ability to feasible and make the Project, to have information about the testing process								
Textbook and /or References	<ol style="list-style-type: none"> 1. Electrical Power Research Institute, "Transmission Line Reference Book: 345 kV and Above", EPRI, 1987. 2. R.D. Begamudre, "Extra High Voltage AC Transmission Engineering", John Wiley, 1986. 3. H.H. Dengiz, "Enerji Hatları Mühendisliği", Emel Yayıncılık, 1982. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	General concepts and classification of power transmission lines.								
2	Related discipline and promotion of weight.								
3	General design principles of energy transmission lines (determination of the route line)								
4, 5	General design principles of energy transmission lines (belong to conductor parameters)								
6, 7	General design principles of energy transmission lines (belong to conductor parameters)								
8	General design principles of energy transmission lines (calculate overhead)								
9	General design principles of energy transmission lines (Under different climatic and environmental conditions change line parameters)								
10	General design principles of energy transmission lines (Under different climatic and environmental conditions change line parameters)								
11	Equipment used in energy transmission lines (poles, protective wire)								
12	Equipment used in energy transmission lines (isolator, damper, spacer,..)								
13	Various operating issues (UP-LIFT, whipping)								
14	Various operating issues (transpozisyon, off-set)								

EE-400 GRADUATION PROJECT / THESIS					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Field Working	Homework	Other	Total	Credit	ECTS Credit
8	15					75	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	A faculty member under the supervision of the independent project work: an engineering problem related to an electrical / electronic circuit or a defined or the system is made of the software design and implementation, faculty members will approve of a project report writing								
Course Objectives	Original ideas put into practice a problem or approach in engineering skills to produce new solutions to ensure								
Learning Outcomes and Competences	Environmental issues related to the field with the spirit of researchers will investigate. Observer ability improves. Research and in collecting all the mass media may use materials. Thesis or project is appropriate to bring engineering solutions								
Textbook and /or References									
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams								
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	100
Instructors									
Week	Subject								
1	Thesis or project will investigate the issue								
2	Extracts about the theoretical and experimental studies								
3	Theoretical work will be essential to investigate the most recent articles								
4	Relevant research material and makes the material. Supply related materials								
5	In theory, determines the implementation phase of the system designed								
6,...,12	Theoretical and experimental study performs								
13	The results obtained are compared adherence to the targeted work								
14	Results report makes								
15	According to the rules of spelling and presentation makes the project work are represented								

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EE-401 CONTROL SYSTEMS-I					Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits			
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit	
7	45					55	100	3	3	
Language	Turkish									
Compulsory / Elective	Compulsory									
Prerequisites	No									
Course Contents	Historical overview of control systems, basic concepts of open loop and closed loop, feedback. Models of physical systems: electrical components, mechanical systems, fluid systems, thermal systems, servomotors. Block diagrams, signal-flow graphs. State-space description, state transitions matrix, companion form, diagonalization of A matrix, transfer function decomposition. Time response analysis, s-plane, steady-state error analysis. Sensitivity, disturbance rejection and stability analysis, Routh-Hurwitz criterion, root-locus plotting. Frequency response analysis: Bode, polar and magnitude-phase plots, Nyquist analysis, gain/phase margins, Nichols chart.									
Course Objectives	To provide students with background needed for basic control systems. System principles like transfer function or stability are understood by students									
Learning Outcomes and Competences	Open or closed loop system transfer function of the extraction ability wins. Transfer function analysis to make certain the stability of the system learns. Bode, Nyquist and root locus analysis can be drawing on the computer									
Textbook and /or References	5. Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill 6. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 7. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 8. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homeworks									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
	Final Exam						X	50		
Instructors										
Week	Subject									
1	Historical overview of control systems									
2	Basic concepts of open loop and closed loop, feedback.									
3,4	Models of physical systems: electrical components, mechanical systems, fluid systems, thermal systems, servomotors.									
5	Block diagrams									
6,7	Signal-flow graphs.									
8,9	State-space description, state transitions matrix, companion form, diagonalization of A matrix, transfer function decomposition.									
9	Time response analysis, s-plane, steady-state error analysis.									
10,11	Sensitivity, disturbance rejection and stability analysis, Routh-Hurwitz criterion, root-locus plotting.									
12, 13	Frequency response analysis: Bode, polar and magnitude-phase plots									
14,15	Nyquist analysis, gain/phase margins, Nichols chart.									

EE-403 CONTROL SYSTEMS LAB.-I				Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7			30			70	100	1	1
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Input and output transducers (position, temperature, pressure, flow rate, humidity, speed, acceleration, light level, sound level). Signal conditioning circuits (comparator, amplifier and converter circuits). Display devices. Basic on/off control systems. Speed control systems. Temperature control systems. Obtaining frequency responses experimentally. Using computer softwares in obtaining the time responses of control systems.								
Course Objectives	Measuring element to understand the signal conversion. Open and closed loop systems feedback to learn the elements. Measuring and control elements to model computer								
Learning Outcomes and Competences	Information obtained from the sensor current, voltage or frequency as the ability to convert wins. The resulting signal processing skills wins. Speed and temperature control system learns. The information learned will make a computer simulation studies.								
Textbook and /or References	5. Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill 6. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 7. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 8. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Position sensors and signal conversions								
2	Temperature sensors and signal conversions								
3	Pressure sensors and signal conversions								
4	Flow rate and humidity sensors and signal conversions								
5	Speed and acceleration sensors and signal conversions								
6	Light and sound sensors and signal level conversions								
7,8	Comparator, amplifier and converter circuits								
9	Imaging devices								
10	Basic open / close control systems								
11	Speed control systems								
12	Temperature control systems.								
13	As to obtain the experimental frequency response								
14,15	Control systems reaction time to obtain the use of computer software.								

EE-461 Communication Systems I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45					55	100	3	4
Language	English								
Compulsory / Elective									
Prerequisites	No								
Course Contents	Review of the Fourier transform and its properties, Transmission of signals through linear systems, filters, Hilbert Transform, pre-envelope, canonical representation of band-pass signals, band-pass systems, phase and group delay, amplitude modulation (AM), double-sideband suppressed carrier modulation (DSB-SC), filtering of sidebands, vestigial sideband modulation, single sideband modulation (SSB), frequency-division multiplexing (FDM), angle modulation, frequency modulation (FM), phase-locked loop, noise analysis of AM and FM, super heterodyne receiver, television.								
Course Objectives	Use the filters, signals, and some techniques in communications applications, and to observe signs of change and make the necessary measurements								
Learning Outcomes and Competences	1) Knows the amplitude modulation and demodulation 2) Knows the frequency modulation and demodulation 3) Know the effect of noise in Digital Communications. 4) Knows the digital modulation and demodulation techniques								
Textbook and /or References	•Communication Systems, S. Haykin, 4th Ed., John Wiley & Sons								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Review of the Fourier transform and its properties								
2	Transmission of signals through linear systems								
3	filters								
4, 5	Hilbert Transform, pre-envelope								
6, 7	canonical representation of band-pass signals								
8	band-pass systems, phase and group delay, Midterm Exam								
9	amplitude modulation (AM), double-sideband suppressed carrier modulation (DSB-SC)								
10	of sidebands, vestigial sideband modulation								
11	single sideband modulation (SSB)								
12	angle modulation, frequency modulation (FM),								
13	frequency-division multiplexing (FDM)								
14	phase-locked loop, noise analysis of AM and FM								
15	super heterodyne receiver, television.								

EE-463 Communication Systems Lab. I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7			30			70	100	1	2
Language	English								
Compulsory / Elective									
Prerequisites	No								
Course Contents	Introduction to analog modulation systems, filters, DSB, DSB-SC, SSB modulation and demodulation, frequency modulation and demodulation, superheterodyne receivers.								
Course Objectives	Use the filters, signals, and some techniques in communications applications, and to observe signs of change and make the necessary measurements								
Learning Outcomes and Competences	1) Knows the amplitude modulation and demodulation 2) Knows the frequency modulation and demodulation 3) Know the effect of noise in Digital Communications. 4) Knows the digital modulation and demodulation techniques								
Textbook and /or References	•Communication Systems, S. Haykin, 4th Ed., John Wiley & Sons								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Review of the Fourier transform and its properties								
2	Transmission of signals through linear systems								
3	filters								
4, 5	Hilbert Transform, pre-envelope								
6, 7	canonical representation of band-pass signals								
8	band-pass systems, phase and group delay, Midterm Exam								
9	amplitude modulation (AM), double-sideband suppressed carrier modulation (DSB-SC)								
10	of sidebands, vestigial sideband modulation								
11	single sideband modulation (SSB)								
12	angle modulation, frequency modulation (FM),								
13	frequency-division multiplexing (FDM)								
14	phase-locked loop, noise analysis of AM and FM								
15	super heterodyne receiver, television.								

EE-443 Digital Signal Processing				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	English							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Signal types and sampling, Discrete-time signals and systems. Sinusoidal, step, pulse and ramp functions and arrays, Sampling theorem (Nyquist theorem). Continuous and discrete time system concepts and their specifications, Input/Output description, Storage and clustering systems, Linear and time-invariant systems, causality, stability and regularity. Convolution theorem, discrete convolution, Difference equation, Laplace and Z-transform, The discrete Fourier series and transform. Solution of difference equation with Z-transform. Digital signal processing methods, spectral analysis methods, advantages and disadvantages, systems with infinite and finite response. Digital processing equipments, analog digital converters, anti-aliasing filters, (fixed and floating point), special purpose signal processing hardware. the discrete Fourier transform and Fast Fourier transform, spectral leakage and windowing,							
Course Objectives	In order to teach the digital signal processing via basic mathematical analysis methods and basic signal processing methods such as discrete Fourier and fast Fourier transforms.							
Learning Outcomes and Competences	To obtain the information about to discrete Fourier transform, Fast Fourier transform, Z-transform, solution of the difference equations, digital filter design.							
Textbook and /or References	<ul style="list-style-type: none"> • Digital Signal Processing Fundamentals, Ashfaq Khan, Laxmi Publication, 2005. • Sayısal İşaret İşleme, Monson H. Hayes, Nobel Yayın Dağıtım, Ankara, 2006. • Sayısal İşaret İşleme, Sarp Ertürk, Birsen Yayınevi, 2005. • Brief Notes in Advanced DSP: Fourier Analysis with MATLAB, Artyom M. Grigoryan, Merughan Grigoryan, CRC Pres, 2009. • Optimal Filtering, Brian D. O. Anderson-John B. Moore, Dover Publications, 2005. • Introduction to Signal Processing, Sophocles J. Orfanidis, Macmillan Publishing, 1988 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Signal types and sampling, Discrete-time signals and systems							
2	Sinusoidal, step, pulse and ramp functions and arrays, Sampling theorem (Nyquist theorem)							
3	Continuous and discrete time system concepts and their specifications							
4	Input/Output description, Storage and clustering systems							
5	Linear and time-invariant systems, causality, stability and regularity							
6	Convolution theorem, discrete convolution, Difference equation							
7	Laplace and Z-transform							
8	Fourier series and conversion							
9	The discrete Fourier series and transform. Solution of difference equation with Z-transform							
10	Digital signal processing methods, , advantages and disadvantages, systems with infinite and finite response							
11	Spectral analysis methods							
12	Digital processing equipments, analog digital converters,							
13	Anti-alias filters, signal processing hardware (fixed or floating point)							
14,15	Special purpose, spectral leakage and windowing							

EE-467 Digital Signal Processing Lab.				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7			45		55	100	1	2
Language	English							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Brings the information about analysis of digital signals and systems, system design, developing of the mathematical of any system. Develops the skills about analytical consideration abilities with the help of DSP sets and MATLAB based applications.							
Course Objectives	In order to teach the digital signal processing via basic mathematical analysis methods and basic signal processing methods such as discrete Fourier and fast Fourier transforms.							
Learning Outcomes and Competences	To obtain the information about to discrete Fourier transform, Fast Fourier transform, Z-transform, solution of the difference equations, digital filter design.							
Textbook and /or References	<ul style="list-style-type: none"> • Digital Signal Processing Fundamentals, Ashfaq Khan, Laxmi Publication, 2005. • Sayısal İşaret İşleme, Monson H. Hayes, Nobel Yayın Dağıtım, Ankara, 2006. • Sayısal İşaret İşleme, Sarp Ertürk, Birsen Yayınevi, 2005. • Brief Notes in Advanced DSP: Fourier Analysis with MATLAB, Artyom M. Grigoryan, Merughan Grigoryan, CRC Pres, 2009. • Optimal Filtering, Brian D. O. Anderson-John B. Moore, Dover Publications, 2005. • Introduction to Signal Processing, Sophocles J. Orfanidis, Macmillan Publishing, 1988 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Properties of sampling,							
2	Properties of decimation,							
3	Properties of interpolation,							
4	Reconstruction,							
5	Effects of aliasing,							
6	Design and implementation of digital filters.							
7	Quantization							
8	effects of quantization on Digital systems							
9	Windowing functions							
10	Properties of windowing functions							
11	Implementation and investigation of discrete Fourier transform							
12	Implementation and investigation of Fast Fourier transform algorithms							
13	Experiments using speech signals							
14	MATLAB simulations							

EE-402 CONTROL SYSTEMS II					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Design considerations: PID control, phase-lead and phase-lag compensator design on rootlocus and Bode plots. Compensation in frequency-domain. State-space representation. Eigenvalues and eigenvectors. Linear transformation. Solution techniques. Controllability and observability. Liapunov's method. Phase plane analysis. Pole assignment. Observer design. Introduction to optimal control. Analysis and design of discrete-time systems. Application examples.								
Course Objectives	PID controller design and the accuracy of the students analyze their skills to provide. Systems can be controlled or can be observed to ensure that their learning.								
Learning Outcomes and Competences	PID control elements impact the root locus of the system or by drawing lines bode sets. Systems that detect auditable or observable. Continuous and discrete-time control system learns the difference.								
Textbook and /or References	1. Linear Control Systems: Analysis and Design, D'Azzo, Houpis, 4. Ed., McGraw-Hill 2. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 3. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 4. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1,2	PID control								
3,4	Root locus and Bode drawings								
3	Defined in the frequency compensation								
4, 5	In state space modeling								
6, 7	Concepts of eigenvalues and eigenvectors								
8	Linear transformations								
9	Controllability and observability. Liapunov method								
10	Situation analysis plane. Pole assignment								
11, 12	Observer design								
13	Optimal control log								
14,15	Discrete-time control systems analysis and design								

EE-404 CONTROL SYSTEMS LAB II				Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8			30			70	100	1	1
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Position and velocity control systems. PID controller design in control system. Using computer softwares in obtaining root locus and frequency responses of control systems. Root locus and frequency response designs of phase lead, phase lag and PID controllers using computer softwares.								
Course Objectives	PID controller design to ensure the learning								
Learning Outcomes and Competences	Comprehend the PID design. Develop skills in computer simulation. Design solutions to problems arising in the ability to produce wins								
Textbook and /or References	1. Linear Control Systems: Analysis and Design, D’Azzo, Houpis, 4. Ed., McGraw-Hill 2. Modern Control Systems, Dorf, Bishop, 9. Ed, Addison Wesley 3. Feedback Control of Dynamical Systems, Franklin, Powell, Emami-Naeini, 4. Ed., Addison Wesley 4. Modern Control Engineering, Ogata, 4. Ed, Prentice Hall								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
12	Position control systems								
3,4	Speed control systems								
5,6	The design of PID controllers in control systems								
7,8,9	Root locus and frequency response of the control system to obtain the use of computer software								
10,11,12	Computer software using phase shifting, phase delay								
13,14,15	Root locus and frequency response of the PID controller designs								

EE-441 ILLUMINATION TECHNIQUES						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	Physics I-II							
Course Contents	Light theories. Eye, sight sensitivity and vision types. Light reflection, absorption and transmission phenomenon. Definition of lighting terms. Lighting types. Internal lighting systems and calculations. Pre-project preparation Fundamentals. Fundamentals of practical application project preparations. External lighting calculations.							
Course Objectives	This course is to acquaint the fourth year electrical and electronics engineering students with fundamental concepts of illumination and to give the required knowledge in order to provide an optimum benefit from the illuminating systems in the real life.							
Learning Outcomes and Competences	The students learn the light theories, eye, sight sensitivity and vision types. Light reflection, absorption and transmission phenomenon is taught. Definition of lighting terms and lighting types are given. Internal lighting systems and calculations can be made by the participants. Pre-project preparation Fundamentals are given and external lighting calculations are learnt.							
Textbook and/or References	<ul style="list-style-type: none"> • Aydınlatma Tekniği, Prof.Dr. Muzaffer ÖZKAYA. • Elektrik Tesisat Planları, Sözleşme, Keşif ve Planlama, Ali DOĞRU. • Elektrik İç Tesisleri Yönetmeliği 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final						x	50	
Instructors								
Week	Subjects							
1	Subjects of illumination							
2	Aims of illumination							
3	Types of illumination and aydınlatma armatures							
4	Light flux, light amount and light intensity							
5	The order of illumination, photographic exertation, photometric radians and luminosity							
6	Cosinus law, The law of inverse of distance-square							
7	Lambert's law, Space-angle projection law							
8	Interm Exam							
9	Applications of photometric laws							
10	Components of illumination							
11	Light and sighting effect. Basics of light generation							
12	Glowing-wired lamps , arc lamps, discharge lamps							
13	Calculation of illumination							
14	Intro to inner and outer electrical materials							
15	Applications							

EE-462 Communication Systems II					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	4
Language	English								
Compulsory / Elective									
Prerequisites	No								
Course Contents	Pulse Modulation: Sampling, quantizing and encoding of analog signals. Multiplexing Baseband Pulse modulation: Matched filter, intersymbol interference, equalization Signal-space analysis: Matched-filter and correlation-type detection and MAP and ML decoding Passband Digital transmission: PSK, FSK, ASK, QAM modulations and bit-error rate analysis in AWGN channels. Spectral efficiency of various modulation schemes.								
Course Objectives	The objective of this course, which is the first undergraduate level course about communication systems, is to introduce the fundamental concepts required for analysis and design of communication systems								
Learning Outcomes and Competences	1) Obtaining a working knowledge on amplitude modulation 2) Understanding single side band modulation 3) Investigating vestigial side band modulation 4) Understanding frequency and phase modulation 5) Discussing the effects of noise on amplitude and frequency modulation systems 6) Evaluating carrier frequency and phase estimation by using phase lock loop circuits								
Textbook and /or References	•Communication Systems, S. Haykin, 4th Ed., John Wiley & Sons								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1,2,3	Pulse Modulation: Sampling, quantizing and encoding of analog signals								
4,5,6	Multiplexing Baseband Pulse modulation: Matched filter, intersymbol interference, equalization								
7,8,9	Signal-space analysis: Matched-filter and correlation-type detection and MAP and ML decoding Midterm Exam								
10,11,12	Passband Digital transmission: PSK, FSK, ASK, QAM modulations and bit-error rate analysis in AWGN channels.								
13,14,15	Spectral efficiency of various modulation schemes.								

EE-464 Communication Systems Lab. II					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8			30			70	100	1	2
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Sampling and reconstruction, time division multiplexing (TDM), pulse time modulation (PTM), pulse code modulation (PCM), differential PCM (DPCM), delta modulation (DM), baseband data transmission methods, amplitude shift keying (ASK), frequency shift keying (FSK), phase shift keying (PSK)								
Course Objectives	The objective of this course, which is the first undergraduate level course about communication systems, is to introduce the fundamental concepts required for analysis and design of communication systems								
Learning Outcomes and Competences	1) Obtaining a working knowledge on amplitude modulation 2) Understanding single side band modulation 3) Investigating vestigial side band modulation 4) Understanding frequency and phase modulation 5) Discussing the effects of noise on amplitude and frequency modulation systems 6) Evaluating carrier frequency and phase estimation by using phase lock loop circuits								
Textbook and /or References	•Communication Systems, S. Haykin, 4th Ed., John Wiley & Sons •Modern Digital and Analog Communication Systems, Lathi, HRW								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Application of Pulse Modulation: Sampling, quantizing and encoding of analog signals								
2	Application of TDM								
3	Application of PTM								
4	Application of PSK								
5	Application of FSK								
6	Application of ASK								
7,8	Application of QAM								
9,10	Application of AWGN								
11,12	Spectral efficiency of various modulation schemes.								
13,14,15	Spectral efficiency of various modulation schemes.								

EE-466 Industrial Electronics				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8.	45				55	100	3	4
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Introduction, power semiconductor switches, power losses in semiconductor switches, Basics of the fourier analysis, RLC circuits, Single and three phase diode/thyristor rectifiers, Design and analysis of DC-DC converters (buck, boost, buck-boost, cuk, sepic), Inverters, square wave inverter, stepped and sinusoidal inverters, bipolar and unipolar sinusoidal PWM generation, Three phase voltage source inverter.							
Course Objectives	This course is designed to equip students with knowledge about power semiconductor switches, basic concepts and design methods of line commutated rectifiers, DC-DC converters and inverters.							
Learning Outcomes and Competences	To obtain the information about power semiconductor switches, basic concepts and design methods of line commutated rectifiers, DC-DC converters and inverters.							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Introduction							
2	Power semiconductor switches,							
3	Power losses of power semiconductor switches,							
4	Basics of Fourier analysis,							
5	RLC circuits,							
6	Single phase diode (uncontrolled) rectifiers,							
7	Single phase thyristor (controlled) rectifiers							
8	Three phase diode (uncontrolled) rectifiers,							
9	Three phase thyristor (controlled) rectifiers							
10	DC-DC converters, Buck converter, Boost converter,							
11	Buck-boost converter, Cuk converter, Sepic converter,							
12	Square wave, stepped and sinusoidal inverters,							
13	Bipolar and unipolar PWM generation,							
14,15	Three phase voltage source inverters.							

EE-468 Industrial Electronics Lab.				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8			30		70	100	1	2
Language	English							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Single phase half wave diode rectifier, Single phase full wave diode rectifier, Three phase half wave diode rectifier, Three phase full wave diode rectifier, Single phase half wave thyristor rectifier, Single phase full wave thyristor rectifier, Three phase half wave thyristor rectifier, Three phase full wave thyristor rectifier, Buck converter, Boost converter, Buck-Boost converter, Cuk converter, sepic converter, Square wave inverter, single phase bipolar and unipolar PWM generation, Single phase voltage source inverter, 12 step inverter, Three phase voltage source inverter experiments,							
Course Objectives	This course is designed to equip students with practical knowledge about basic concepts and design methods of							
Learning Outcomes and Competences	To obtain the information about basic concepts and design methods of							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam						x	50	
Instructors								
Week	Subject							
1	Single phase half/full bridge uncontrolled rectifier experiment,							
2	Three phase half bridge uncontrolled rectifier experiment,							
3	Three phase full bridge uncontrolled rectifier experiment,							
4	Single phase half bridge controlled rectifier experiment,							
5	Single phase full bridge controlled rectifier experiment,							
6	Three phase half bridge controlled rectifier experiment,							
7	Three phase full bridge controlled rectifier experiment,							
8	Buck converter experiment, Boost converter experiment,							
9	Buck-Boost converter experiment,							
10	Cuk converter experiment, Sepic converter experiment							
11	Single phase square wave inverter experiment,							
12	1 phase bipolar and unipolar PWM generation and single phase voltage source inverter experiments,							
13	12 step inverter experiment,							
14,15	Three phase voltage source inverter experiment,							

Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Field Working	Homework	Other	Total	Credit	ECTS Credit
8	15					75	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	A faculty member under the supervision of the independent project work: an engineering problem related to an electrical / electronic circuit or a defined or the system is made of the software design and implementation, faculty members will approve of a project report writing								
Course Objectives	Original ideas put into practice a problem or approach in engineering skills to produce new solutions to ensure								
Learning Outcomes and Competences	Environmental issues related to the field with the spirit of researchers will investigate. Observer ability improves. Research and in collecting all the mass media may use materials. Thesis or project is appropriate to bring engineering solutions								
Textbook and /or References									
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams								
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	100
Instructors									
Week	Subject								
1	Thesis or project will investigate the issue								
2	Extracts about the theoretical and experimental studies								
3	Theoretical work will be essential to investigate the most recent articles								
4	Relevant research material and makes the material. Supply related materials								
5	In theory, determines the implementation phase of the system designed								
6,...,12	Theoretical and experimental study performs								
13	The results obtained are compared adherence to the targeted work								
14	Results report makes								
15	According to the rules of spelling and presentation makes the project work are represented								

SEÇMELİ DERSLER

ISH 201 LABOR LAWS				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
3	30				70	100	2	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	Laws regulating working life and the related legal regulations.							
Course Objectives	Working life and the related laws regulating the legal arrangements to inform							
Learning Outcomes and Competences	Working life and the related laws regulating the legal regulations about the ability to follow							
Textbook and /or References	İş Hukuku, Ercan Akyiğit,Seçkin yayıncılık,2010.							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final						x	50	
Instructors								
Week	Subjects							
1	Introduction to business law							
2	Important legislation of labor law							
3	The basic concepts of labor law							
4	Application areas of employment law							
5	Types of employment contract							
6	Work done contract work was forbidden							
7	Workers 'and employers' rights under the labor agreement and the debts							
8	Workers 'and employers' rights under the labor agreement and the debts Termination of employment contract, working hours, permits and fees							
9	Midterm Exam							
10	The concept of social security							
11	Trade union law							
12	Collective bargaining law							
13	Strike							
14	Lockout							
15	Rights and interests disputes							

EKO-201 ECONOMY				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
3	30				70	100	2	2
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Economic science and economics, economic analysis tools, demand, supply and markets; price and income demand and supply quantities of the impact; mixed state in the economy, consumer theory, production and costs, perfect competition and monopoly, market structures and incomplete competition; MACROECONOMICS input and national income, national income determination, aggregate demand and aggregate supply, monetary and banking, central banking and monetary system, inflation and underemployment; open economy macroeconomics, international monetary system, international trade, European Union, economic growth, developing countries' problems							
Course Objectives	Era of economic, social and technological aspects in the development of which is open until undeniable contribution to the basic principles of economics and economic thought to explain the logic. Economic analysis of events and the basic rules for interpretation of the disclosure, the price mechanism and the analysis of price formation. Production, costs and production factors, together with the examination of enterprise and variations. Money and banking issues and some analysis of current developments. International economic issues, multinational companies, foreign capital, the stock market applications, and Turkey, to inform students about the national income							
Learning Outcomes and Competences	Students will be able to do the following: the basic principles of economics and economic thinking to understand the logic. Price mechanism and the formation of prices to convey. Production, together with costs and production factors and types of enterprise to examine. Money and banks to analyze issues and some current developments. International economic issues, multinational companies, foreign capital, stock market information applications and Turkey.							
Textbook and /or References	Temel ekonomi, Tümay Ertek, Bayındırlık ve İskan Bakanlığı, 2008.							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final					x	50		
Instructors								
Week	Subjects							
1	Introduction to the economy, the subject and description, other scientists interested in							
2	Economic problems, Economic selection and production possibilities curve, Needs-Goods-Services-Benefits Economic and Production possibilities curve selection Needs-Goods-Services-Benefits							
3	Economic systems, population problems, economic growth Economic							
4	Price theory and price mekanizasının logic, Description, Price and market types							
5	Price theory and price mekanizasının logic, Description, Price and market types Definition of demand, Demand Law, Consumer demand and marginal Benefits							
6	The definition of supply, supply determinants, elasticity of supply and supply-demand balance							
7	Market equilibrium, competitive markets, market factors and interventions that affect the balance							
8	Production factors, Nature, labor, capital costs and efficiency							
9	Midterm Exam							
10	Enterprises, private-public enterprises, Kartel, Trust, Monopoly							
11	Labor force and unemployment problems. International labor flows							
12	Banks and banking							
13	International Economics, Foreign Capital and multinational companies Multinational companies							

	Foreign Capital and Multinational companies
14	International Economics, Foreign Capital and multinational companies Multinational companies Foreign Capital and Multinational companies
15	Commodity-Stock Exchange in the world and Turkey, Electronic commerce.

ORG- 202 FACTORY ORGANIZATION					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
4	30				70	100	2	2
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Production-related concepts, system concept, Decision theory, factory organization studies, organizational goals, product decisions, resource and market research, production, type of identification, feasibility report, profitability reports, Ar-Ge concept, in business Ar-Ge activities and strategies, The causes of Ar-Ge activities in enterprises, Ar-Ge strategies, Ar-Ge planning efforts.							
Course Objectives	Discussed in detail the concepts of production and products, the factory work and organizations to provide general information about objectives. Basic principles and applications of concepts discussed in daily life understood in business Ar-Ge efforts to ensure reasons and to ensure planned.efforts.							
Learning Outcomes and Competences	Applications with high quality production and daily life has handled the development of research and development.							
Textbook and /or References								
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						X	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final						X	50	
Instructors								
Week	Subjects							
1	Concepts Production Related							
2	Concept System							
3	Decision Theory							
4	Studies Factory Organization							
5	Market Research, Determination Production Type.							
6	Midterm Exam							
7	Feasibility Report, Rantability Report							
8	Factory Operation and							
9	Process Improvement, Project Management							
10	Ar-Ge concept							
11	Ar-Ge activities and strategies in firms							
12	The causes of Ar-Ge activities in enterprises							
13	Ar-Ge strategies							
14	Planning of Ar-Ge work.							
15	Ar-Ge work to increase the success of taking measures							

ISL -202 BUSINESS				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
4	30				70	100	2	2
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Basic Concepts of Business and Management, and Environmental Objectives and Relations, Classification of Business Administration, Management of the Foundation Studies, Size and Capacity, Management Functions, Organization of the Work.							
Course Objectives	Basic concepts of business, to comprehend the objectives and their relationship with the environment. Business types can sort. Organization of businesses work, site selection organization and determine the capacity of businesses to be able to comprehend. Relationship between business functions and they can comprehend. Emerging issues in business management can understand.							
Learning Outcomes and Competences	Basic concepts and scope of business and management understanding. The establishment and organization of work to learn the business operation of the clutch.							
Textbook and /or References	Prof. Dr. İsmet MUCUK Türkmen Kitabevi Temel İşletme Bilgileri Yrd. Doç. Dr. Hasan TUTAR Seçkin Kitabevi İşletme Yönetimi Dr. Semiha Özalp GÜNAL Zeus Kitabevi Genel İşletme							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						X	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						X	50
Instructors								
Week	Subjects							
1	Business and management related to basic concepts and objectives of businesses.							
2	Its place in the economic structure of enterprises and its relationship with the environment							
3	Business objectives and the differences between executives and entrepreneurs.							
4	Businesses in terms of economic function. According to size and capital ownership enterprises							
5	Whether or not international and businesses according to the agreement between businesses, according to the legal structure of businesses.							
6	Midterm Exam							
7	The phases of the business organization							
8	Business organizations play a role in site selection factors							
9	Determining the size and capacity of business enterprises in different capacities and concepts.							
10	Definition of production, properties and classification of production systems.							
11	Marketing management and marketing research functions.							
12	Financing of the definition, importance and necessary financial resources for businesses.							
13	The objectives of accounting functions and accounting types. Forms of decision making in business management,							
14	Factors that prevent communication and communication in organizations, change and development in organizations, Organization and conflict in groups.							
15	Strategic management and crisis management, relationship management and motivation.							

SS 301 PHOTOGRAPHY				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Technics of experimental photography, painting with light and image dynamics, Dynamics of multiple shots, combination of photographic image and typography and to make object electeded photography								
Course Objectives	To make a connection between basic photography knowledge and graphical basic design knowledge. To make a original images with using photography technics in the field of graphic design and typography.								
Learning Outcomes and Competences	1) To have basic photography knowledge 2) To have basic photography techniques 3) To make a connection between photography techniques and graphical components. 4)To have a photographic images with using typography 5) To have an ability to take edited object photos								
Textbook and /or References	Michael Langford, Yaratıcı Fotoğrafçılık, İnkılap Kitabevi.								
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Basic photography concepts								
2	Practice of experimantal photo with specified subject								
3	Practice of experimantal photo with specified subject								
4	Practice of experimantal photo with specified subject								
5	Painting with light and image dynamics								
6	Painting with light and image dynamics								
7	Painting with light and image dynamics								
8	Mid-term								
9	Photograph practice with typography								
10	Photograph practice with typography								
11	Photograph practice with typography								
12	Illustrative works on subjected photos in the digital field								
13	Illustrative works on subjected photos in the digital field								
14	Illustrative works on subjected photos in the digital field								

SS 303 VITRAY				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	History of Vitray, Critism of Vitrays, Making creative projects in Vitray tecnique, Using of vitrays in inside and out side of the places.								
Course Objectives	Creating new art projects by using Vitray tecnique.								
Learning Outcomes and Competences	To recognize vitray tecnique and using of materials. To distinguish the use of different materials and tecniques. To prepare suitable Sketches to the vitray tecnique. To apply vitray tecnique. To evaluate artistic problematics and developpe an artistic manner. To criticize vitray Works.								
Textbook and /or References	History books, Vitray photos belonging to various museums and churches Decoration magazines and books								
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	History of Vitray, Special feature of its tecniques and introducing the supplies								
2	Examples of vitray and critics of these works								
3	Knowledges of colours								
4	Preparing the preliminary sketches with using basic geometrical forms.								
5	Continue the preparing of preliminary sketches								
6	Regulating of the preliminary sketches								
7	Drawing of the preliminary sketches on the glass								
8	Mid-term								
9	Application to the glass								
10	Application to the glass								
11	Application to the glass								
12	Application to the glass								
13	Application to the glass								
14	Criticism and evaluation								

EE-471 MICROWAVE TECHNIQUES I						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab	Project/Field Study	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	Electromagnetic Field Theory I							
Course Contents	Review of Electromagnetic wave theory. Frequency and time domain analysis of transmission lines. Rectangular and circular wave guides. Equivalent circuit analysis of microwave systems. Impedance transformation and matching techniques.							
Course Objectives	To teach the basic concepts and phenomenon of Maxwell's equations, wave propagation, network theory, and related topics, as applied to modern microwave engineering.							
Learning Outcomes and Competences	Designing of specific microwave components, due to their motivational and practical value. Learning methods used for analysis and logic behind these designs. Understanding the process of applying fundamental principles to arrive at useful results.							
Textbook and/or References	<ul style="list-style-type: none"> • Foundations for Microwave Engineering, R. E. Collin., McGraw-Hill. • Microwave Engineering, David M. Pozar, Addison-Wesley Publishing Company. • Microwave Engineering- Passive Circuits, P. A. Rizzi, Prentice-Hill. 							
Assessment Criteria								Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final							x	50
Instructors								
Week	Subjects							
1	Intro to electromagnetic theory, Maxwell's equations, boundary conditions, Helmholtz's (wave) equation.							
2	Plane waves in lossless media, plane waves in lossy media, skin depth, group velocity, phase velocity.							
3	Field analysis of transmission line; general transmission-line equations, transmission-line parameters							
4	Wave characteristics on an infinite transmission-line. Wave characteristics on a finite transmission-line.							
5	The terminated lossless transmission-line, lossy transmission-lines. Reflection on transmission lines.							
6	Interim Exam							
7	Reflection coefficient and standing-wave ratio, power on transmission-line, the Smith chart, admittances on Smith chart.							
8	Analyzing solutions for single-stub, double-stub, shunt and series stubs.							
9	Applying for single-stub, double-stub, shunt and series stubs with Smith chart.							
10	General solutions for TEM, TE and TM waves, transverse electromagnetic waves, transverse magnetic waves, transverse electric waves.							
11	Rectangular waveguides; TM waves in rectangular waveguides, TE waves in rectangular waveguides.							
12	Circular waveguides; TM waves in circular waveguides, TE waves in circular waveguides.							
13	Excitation of resonators, rectangular resonators, quality factor in resonators.							
14	Applications of microwaves							
15	Applications of microwaves							

EE-470 MICROWAVE TECHNIQUES II						Electrical and Electronics Engineering		
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	Electromagnetic Field Theory I, Microwave Techniques I							
Course Contents	Planar transmission lines, Serial resonant circuits, Parallel resonant circuits, Cavities and Fabry-Perot resonators, Power dividers, Periodic structures, k-b diagrams, Implementation of filters, Microwave transistor amplifier design							
Course Objectives	<p>This course aims to develop basic understanding of the issues:</p> <ul style="list-style-type: none"> - To recognize passive microwave circuit elements and blocks. - To design basic filter designs. These can be Butterworth or Chebychev filters with <ul style="list-style-type: none"> - low pass - high pass - band pass - band stop or band reject frequency behavior. - To realize filter designs in the form of transmission line circuits. - To design microwave amplifiers. - To find microstrip or stripline dimensions of transmission line circuit designs. - To be ready in microwave circuit theory and techniques for a more detailed analysis and design studies. 							
Learning Outcomes and Competences	<p>Students successfully completing this course is expected to acquire the following skills:</p> <ul style="list-style-type: none"> - To recognize passive microwave circuit elements and blocks. - To design basic filter designs. These can be Butterworth or Chebychev filters with <ul style="list-style-type: none"> - low pass - high pass - band pass - band stop or band reject frequency behavior. - To realize filter designs in the form of transmission line circuits. - To design microwave amplifiers. - To find microstrip or stripline dimensions of transmission line circuit designs. - To be ready in microwave circuit theory and techniques for a more detailed analysis and design studies. 							
Textbook and /or References	<ul style="list-style-type: none"> • Foundations for Microwave Engineering, R. E. Collin, McGraw-Hill. • Microwave Engineering, David M. Pozar, Addison-Wesley Publishing Company. • Microwave Engineering- Passive Circuits, P. A. Rizzi, Prentice-Hill. 							
Assessment Criteria							Percent (%)	
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week	Subjects							
1	An intro to planar transmission lines							
2	Applications of planar transmission lines							
3	Serial resonant circuits							
4	Parallel resonant circuits							
5	Cavities and Fabry-Perot resonators							
6	Excitation of cavities							
7	Power dividers							
8	Directional couplers and hybrids							

9	Periodic structures
10	k-b diagrams
11	Filter design by insertion loss method
12	Implementation of filters
13	Microwave realization of filters
14	Microwave transistor amplifier design
15	Applications to microwave transistors

KAL-402 QUALITY AND RELIABILITY				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
3	30				70	100	2	2
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisite	No							
Course Contents	Quality definition, historical development, quality assurance, construction quality, building quality components, ISO 9001 Quality Management System Standards, a construction company to the ISO 9001 system, establishing quality standards in terms of the structure to be analyzed.							
Course Objectives	The aim of this course, quality management systems, applications from what is happening and recognizing the construction sector							
Learning Outcomes and Competences	Students taking this course, the quality management system, a construction contracting company involved in creating and implementing will be able to receive.							
Textbook and /or References	İnşaat Sektöründe Kalite Yönetim Sistemi Uygulamaları, Recep Kanıt, Gazi Kitabevi, 2005. ISO 9001 Kalite Yönetim Sistemi Standardı.							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
Final					x	50		
Instructors								
Week	Subjects							
1	Definition of quality							
2	Quality of the concept of historical development							
3	Quality assurance							
4	Structure quality in-1							
5	Structure quality in-2							
6	Structure elements of quality in-1							
7	Structure elements of quality in-2							
8	ISO 9001 Quality Management System Standard-1							
9	Midterm Exam							
10	ISO 9001 Quality Management System Standard							
11	ISO 9001 system to establish a construction company							
12	ISO 9001 system to establish a construction company							
13	ISO 9001 system to establish a construction company							
14	Standards in terms of build quality to be analyzed							
15	Standards in terms of build quality to be analyzed							

EE- 477 Introduction to Biomedical Engineering					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
7	45			55	100	3	4
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	Physics I, II						
Course Contents	General principles of biomedical measurement systems. Transducers for displacement, force, pressure, temperature, and radiation measurements. Measurement of pressure, volume, and flow. Origin of bioelectrical potentials, ionic basis of action potentials. Propagation of action potentials. Biopotential electrodes. Theory of EKG, EMG, EEG. Amplification and processing of bioelectric signals, instrumentation amplifier, interference-reduction. Grounding, shielding, isolation, and electrical safety in medical instrumentation.						
Course Objectives	Biomedical engineering, in general, is an interdisciplinary field in which knowledge in engineering, biology, chemistry and medicine is used to obtain new information of biological systems and development of new devices, processes, and algorithms in the field. Students will learn well known systems and their principles in medicine and biology along with the engineering formation gained for analysing the methods and approaches in this different field						
Learning Outcomes and Competences	The origin of the measurable biologic signals, their mathematical models and measurement methods are among the knowledge that students will gain. After learning the analysis of the bioelectric signals, studying design aspects of the measurement equipments by using the engineering skills and experiencing special practical problems in medical field after understanding the analysis of the bioelectric signals will be important achievement for the students who may work in this area.						
Textbook and /or References	Medical Instrumentation, Application and Design, Webster, 3rd Ed., Wiley Bioinstrumentation, Webster, Wiley						
Assessment Criteria						Number	Percent (%)
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					X	50
Instructors							
Week							
1	Basic concepts of instrumentation.						
2	Basic transducers and principles.						
3	The origin of biopotentials						
4	Biopotential electrodes.						
5	Biopotential amplifiers.						
6	Midterm-I						
7	Anatomy and function of the heart.						
8	Operational principles of Electrocardiograph						
9	Anatomy and function of the brain.						
10	Operational principles of EEG						
11	Respiratory system and modeling. Operational principles of respirators.						

12	Physiology of the kidney
13	Operational principles of hemodialysis system.
14	Grounding, shielding, isolation, and electrical safety in medical instrumentation.

EE -483 Electromagnetic Compatibility					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	Electromagnetic Field Theory I							
Course Contents	Basics of Electromagnetic Compatibility (EMC). EMC units. Sources and modeling of Electromagnetic interference (EMI). Electrostatic discharge. Shielding theory. High and low impedans fields. Inductive and capacitive coupling. Application of shielding, grounding and bonding. EMI filters. Frequency spectrum utilization and planning. EMC regulations and measurements.							
Course Objectives	Students successfully completing this course is expected to acquire the following skills: -To understand the introductory concepts of Electromagnetic compatibility							
Learning Outcomes and Competences	Upon successful completion of the course, the student understands the concept of the electromagnetic compatibility and has foundation to work on special aspects of electromagnetic compatibility.							
Textbook and/or References	Engineering Electromagnetic Compatibility, Kodali, IEEE Press Introduction to Electromagnetic Compatibility, Paul, John Wiley & Sons Noise reduction techniques in electronic systems, Ott, 2nd Ed., John Wiley & Sons							
Assessment Criteria							Number	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						X	50
Instructors								
Week								
1	Basics of Electromagnetic Compatibility (EMC).							
2	EMC units.							
3	EMI Sources							
4	Modeling of Electromagnetic interference							
5	Electrostatic discharge.							
6	Midterm							
7	Shielding theory.							
8	High and low impedans fields.							
9	Inductive coupling.							
10	Capacitive coupling.							
11	Application of shielding, grounding and bonding.							
12	EMI filters.							
13	Frequency spectrum utilization and planning.							
14	EMC regulations and measurements.							

EE -479 VLSI Circuit Design					Electrical and Electronics Engineering			
Semester	Teaching Methods							Credits
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Design techniques for rapid implementation of very large-scale integrated (VLSI) circuits. MOS technology and logic. Structured design. Design rules, layout procedures. Design aids: Layout, design rule checking, logic, and circuit simulation, timing. Testability.							
Course Objectives	The goal in this course is to teach the basics of the ASIC and the FPGA design. The design principles are thought as bottom up in this course. Initially the layout level calculations and current voltage relations are discussed. Then the layout drawing of designs and their simulations in the laboratory is experimented. This level is mostly for the benefit of ASIC designers working with RF etc. The resistor, capacitance calculations at this level is introduced. Then in the transistor level these designs are revisited at a higher level. this enables a comparison to be made between two abstraction levels in terms of parasitic effects. Following this the CMOS fabrication is presented.							
Learning Outcomes and Competences	Scaling is discussed to expose the student with the facts of the developing VLSI technology. Limiting factors on Scaling is also discussed. CMOS design is thought in detail and various ways of CMOS design is presented and discussed. VHDL design is thought to enable the student to design and debug much faster. With the VHDL design in hand, the student experiments a whole top down design approach to see all the stages of a VLSI design. Following this an FPGA experiment is performed to complement the course. FPGA enables the result of the work to be seen instantaneously.							
Textbook and /or References	Principles of CMOS VLSI Design- A systems perspective, Weste and Eshraghian, Addison Wesley CMOS Digital Integrated Circuits - Analysis and Design, Kang and Leblebici Basic VLSI Design, Pucknell and Eshraghian, Prentice Hall A VHDL Primer, Bhasker, Prentice Hall Chip Level Modeling with VHDL, Armstrong, Prentice Hall VLSI Cookbook							
Assessment Criteria							Number	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						X	50
Instructors								
Week								
1	Introduction to VLSI design problem.							
2	Design domains, design actions, design methods and technologies							
3	MOS technology.							
4	Logic structured design.							
5	Design rules.							
6	Layout procedures.							
7	Midterm 1							
8	Design aids.							

9	Layout, design rule checking
10	Logic and circuit simulation.
11	FPGA
12	VHDL
13	Testability.
14	Project to develop layout circuits.

EE -484 Antenna and Propagation					Electrical and Electronics Engineering			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	Electromagnetic Field Theory							
Course Contents	The course has two major contents: Antennas and propagation. The antenna part has these topics: Introduction to Antennas, Fundamentals of EM Radiation, Fundamental Antenna Parameters, Radiation from small elements (dipoles and loops) and arbitrary current distributions, Dipoles and Loops, Introduction to Antenna Arrays, Basic Array Design (Array Pattern Synthesis), Aperture Type Antennas, Field Equivalence Principles, Aperture Antenna Examples (Horns, Slots, Microstrips, Reflectors, Lenses), Receiver Antennas..							
Course Objectives	The students are expected to understand the basics of radiation and reception thru antennas. The two basic antenna types are introduced: wire and aperture antennas. At the end of the course, the students should be able to compute the radiation from any type of wire antenna with any type of current distribution and the radiation from basic types of aperture antennas with any type of aperture field distribution.							
Learning Outcomes and Competences	The students should be able differentiate various types of antennas by their fundamental parameters such as bandwidth, first null and half power beamwidths, radiation patterns, efficiency and radiation resistance. Arrays are an important part of the course and the students should be able to compute radiation from linear, and planar arrays. They are exposed to basics of array pattern synthesis and introduced to optimum array design with Chebyshev polynomials. The second major group of antennas, aperture antennas are introduced through Fourier Transform technique and field equivalence principles. The student is expected to distinguish various forms of aperture type antennas with respect to their main electrical parameters such as bandwidth, first null and half power beamwidths, radiation patterns, aperture efficiency and application areas. The receiving antennas are discussed through reciprocity theorem and effective length and effective aperture. The students should be able to figure out the open circuit voltage for any type of antenna and combine the antenna output with receiver noise. At the end of the course, the students should have a basic understanding of the EM spectrum and enough background in propagation mechanisms of each band. They should also understand the important factors that affect wave propagation in atmosphere and have a basic background in communication theory.							
Textbook and /or References	Antennas and Radiowave Propagation, Collin, McGraw Hill Antenna Theory, Balanis, John Wiley and Sons Antennas, Kraus, McGraw Hill Electromagnetic Waves and Radiating Systems, Jordan and Balmain, Prentice Hall							
Assessment Criteria							Number	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week								
1	Fundamental parameters of antennas							
2	Small and finite size dipoles							

3	Ground interference effects
4	Loop antennas
5	Analysis and synthesis of linear, planar and circular arrays
6	Midterm
7	Aperture antennas
8	Microstrip antennas
9	Radio wave propagation
10	The Radio Wave Propagation part includes propagation mechanisms.
11	propagation modes for ELF, VLF, LF, MF, HF, VHF, UHF and SHF (Microwave and millimeter) bands,
12	Multipath, Fading,
13	Ground Reflection, Diffraction, Refraction
14	Attenuation, Propagation Loss

EE -472 Communication Electronics					Electrical and Electronics Engineering			
Semester	Teaching Methods							Credits
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Active and passive filters and active filter design techniques. Broadband and narrow band transformer-like coupling networks. Analysis and design of RF-IF amplifier using yparameters. Sinusoidal oscillators: LC and crystal oscillators. Power amplifiers. Amplitude and frequency modulators and demodulators.							
Course Objectives	To learn analysis and design of filters, amplifiers, oscillators, modulators and demodulators used in the communication systems							
Learning Outcomes and Competences	To gain necessary concepts for the design and analysis of communication systems							
Textbook and /or References	Communication Circuits: Analysis and Design- Kenneth K. Clarke and Donald T. Hess							
Assessment Criteria							Number	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								
Week								
1	Active and passive filters							
2	Active filter design techniques							
3	Active filter design techniques							
4	Broadband and narrow band transformer-like coupling networks.							
5	Analysis of RF-IF amplifier							
6	Midterm I							
7	Design of RF-IF amplifier using y-parameters							
8	Design of RF-IF amplifier using y-parameters							
9	Sinusoidal oscillators							
10	Crystal oscillators							
11	Midterm II							
12	Power amplifiers							
13	Amplitude and frequency modulators							
14	Amplitude and frequency demodulators							

EE-482 Image processing				Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	45					55	100	3
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Digital image, digital image processing concept, applications and basics of digital image processing, analog-digital transformation. İmage files, taking image methods, image filters, geometric operations and transformations in digital images, classification of images.							
Course Objectives	To learn basics and application of image processing.							
Learning Outcomes and Competences	The students acquire the following abilities: 1. Explain image structure in computer environment. 2. Make translation, rotation, zooming and invers of an image. 3. Make pixel neighborhood operation on the image. 4. Know image enhancement algorithms.							
Textbook and /or References	Digital Image Processing, 3rd Edition (DIP/3e) by Gonzalez and Woods, Prentice Hall Görüntü İşleme Teknikleri ve Mühendislik Uygulamaları, A. Muhittin Albora, Osman N. Uçan, Onur Osman, NOBEL YAYIN DAĞITIM, 2007 Digital Image Processing using Matlab, by Gonzalez, Woods, and Eddings, Prentice Hall, 1st Edition							
Assessment Criteria							Number	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						X	50
Instructors								
Week								
1	Basic operation using Matlab							
2	Basic operation using Matlab							
3	Basic concept about image processing							
4	Image File, translation, rotation, inverse and sizing operation							
5	Midterm							
6	Thresholding, Histogram equalization, image brightness operation							
7	Pixel neighborhood operations							
8	Pixel neighborhood operations							
9	Filtering in frequency domain							
10	Filtering in frequency domain							
11	Morphological operation							
12	Morphological operation							
13	Motion estimation							
14								

EE-475 DATA COMMUNICATION TECHNIQUES					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
7	45				55	100	3
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	<ul style="list-style-type: none"> - Introduction, layered structure of computer networks - Physical layer: Guided transmission media, unguided transmission media, data and modulation, multiplexing, duplexing, multiple access methods - Data link layer: Stop-and-wait flow control, sliding-window flow control, stop-and-wait ARQ, selective-reject ARQ, go-back-N ARQ, performance issues of flow control and error control - Review of queueing theory: Discrete-time Markov chain, Little's theorem, M/M/1 queue, M/M/m queue - Medium access control sublayer: Static and dynamic channel allocation, ALOHA, carrier sense multiple access protocols, limited contention, protocols, wireless LAN protocols - Network layer: Virtual-circuit and datagram subnets, sink tree, Dijkstra's algorithm, flooding, distance vector routing, link state routing, internetworking, fragmentation, subnets, CIDR (Classless InterDomain Routing) - Transport layer: Transport layer services, socket primitives for TCP, transport protocols 						
Course Objectives	<p>The Student,</p> <ul style="list-style-type: none"> - Understands the concept of layered structure in computer networks - Identifies the issues and parameters related to each layer - Gains a background in methods and algorithms used in each layer 						
Learning Outcomes and Competences	The student can understand the fundamental concepts of data communications and computer networks.						
Textbook and/or References	<p>Textbook: Computer Networks, Andrew S. Tanenbaum, Fourth Edition, Pearson Education</p> <p>References: Data and Computer Communication, W. Stallings, 6th Ed, Prentice Hall Data Networks, D. Bertsekas and R. Gallager, 2nd Ed, Prentice Hall</p>						
Assessment Criteria						<i>Number</i>	<i>Percent (%)</i>
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					x	50
Instructors							
Week							
1	Introduction,						
2	layered structure of computer networks						
3	Guided transmission media, unguided transmission media, data and modulation,						

4	multiplexing, duplexing, multiple access methods
5	Stop-and-wait flow control, sliding-window flow control,
6	stop-and-wait ARQ, selective-reject ARQ, go-back-N ARQ, performance issues of flow control and error control
7	Discrete-time Markov chain, Little's theorem, M/M/1 queue, M/M/m queue
8	- edium access control sublayer: Static and dynamic channel allocation,
9	ALOHA, carrier sense multiple access protocols, limited contention, protocols, wireless LAN protocols
10	- Network layer: Virtual-circuit and datagram subnets, sink tree,
11	Dijkstra's algorithm, flooding,
12	distance vector routing, link state routing, internetworking, fragmentation, subnets,
13	CIDR (Classless InterDomain Routing)
14	- Transport layer: Transport layer services, socket primitives for TCP, transport protocols

EE- 474 PROCESS CONTROL					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
8	45				55	100	3
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	Control of industrial processes: Mathematical modeling of fundamental processes. Proportional, integral, derivative, on-off, floating modes of controls, feed forward and cascade types of loops. Minimization of integral square error. Characteristics of flow, pressure and level control loops and final control elements. Fundamentals of control of basic processes such as heat exchange, distillation, combustion, drying. Organization of direct digital control loops.						
<u>Course Objectives</u>	Giving the fundamental ability to design process control systems.						
<u>Learning Outcomes and Competences</u>	Design and analysing the basic process control systems.						
Textbook and/or References	Textbook : “A real time approach to process control”, Wiley, 2000, ISBN:0-471-80452-5						
Assessment Criteria						<i>Number</i>	<i>Percent (%)</i>
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
Final						x	50
Instructors							
Week							
1	Introduction.						
2	Control of industrial processes:						
3	Mathematical modelling of fundamental distributed parameter processes.						
4	Lumped parameter approximation.						
5	Disturbance filtering characteristics of control loops.						
6	Proportional, integral, derivative controls,						
7	On-off, floating modes of controls						
8	Feed forward and cascade types of loops.						
9	Minimization of integral square error.						
10	Characteristics of flow, pressure and level control loops						
11	Final control elements.						
12	Fundamentals of control of basic processes						
13	such as heat exchange, distillation, combustion, drying.						
14	Organization of direct digital control loops.						

EE-478 Digital Communications					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
8	45				55	100	3
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	Optimum Receiver: Matched-filter vs correlation receiver. Maximum likelihood (ML) vs maximum a-priority (MAP) decoding. Optimum BER performance of various M-ary modulation schemes in AWGN channels. Error-correction coding: Block and convolutional codes. Introduction to turbo and low-density parity-check codes (LDPC). Spread-spectrum (SS) techniques: Direct-sequence spread spectrum, Frequency-hopping spread-spectrum. AJ, LPI, ranging, multiple-access capabilities. Synchronization of SS systems.						
<u>Course Objectives</u>	Giving the fundamental information about digital communication systems.						
<u>Learning Outcomes and Competences</u>	Design and analysing digital communication systems.						
Textbook and /or References	Textbook : “Digital Communications, Proakis, McGraw Hill						
Assessment Criteria						<i>Number</i>	<i>Percent (%)</i>
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					x	50
Instructors							
Week							
1 2 3 4 5 6 7 8 9 10 11 12 13 14	Optimum Receiver: Matched-filter vs correlation receiver. Maximum likelihood (ML) vs maximum a-priority (MAP) decoding. Optimum BER performance of various M-ary modulation schemes in AWGN channels. Error-correction coding: Block and convolutional codes. Introduction to turbo and low-density parity-check codes (LDPC). Spread-spectrum (SS) techniques: Direct-sequence spread spectrum, Frequency-hopping spread-spectrum. AJ, LPI, ranging, multiple-access capabilities. Synchronization of SS systems.						

EE -476 MICROWAVE COMPONENTS					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
8	45				55	100	3
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	Fundamentals of microwave circuit design. Principles of synthesis based universal design method. The prototype system synthesis mechanism. Realizations of prototypes. A summary of the design process. Decomposition of devices to the reactive two port devices. Circuit library/ data base. Selection of frequency responses of systems. Single and dual ended systems. Canonical forms. System conversion. Principles of active circuit design. Distributed amplifiers.						
<u>Course Objectives</u>							
<u>Learning Outcomes and Competences</u>	The student can understand the fundamental concepts of data communications and computer networks.						
Textbook and /or References	Textbook: Brian J. Minnis, Designing Microwave Circuits by Exact Synthesis, Artech House, Boston, USA, 1996.						
Assessment Criteria						<i>Number</i>	Percent (%)
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					x	50
Instructors							
Week							
1	Introduction.						
2	Fundamentals of microwave circuit design.						
3	Principles of synthesis based universal design method.						
4	The prototype system synthesis mechanism.						
5	Realizations of prototypes.						
6	A summary of the design process.						
7	Decomposition of devices to the reactive two port devices.						
8	Circuit library/ data base.						
9	Selection of frequency responses of systems.						
10	Single and dual ended systems.						
11	Canonical forms.						
12	System conversion.						
13	Principles of active circuit design.						
14	Distributed amplifiers.						

EE- 485 OPTOELECTRONICS					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
7	45			55	100	3	4
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	Introduction to optoelectronics. Wave propagation in various media. Polarization. Fresnel equation. Electro optics. Optical materials.. Optical properties of materials. Optical sources (LED, LD) and transmitters. Optical detectors and receivers. Other optical components. Integrated optics. New developments in optics.						
Course Objectives							
Learning Outcomes and Competences	The student can understand the fundamental concepts of data communications and computer networks.						
Textbook and /or References	Textbook: Optoelektronik, J Wilson and J.F.B. Hawks, (Çev: İbrahim Okur), Değişim Yay., 2000 Elements of optoelectronics and fiber optics, Chin-Lin Chen ; Fundamental of photonics, Bahaa E.A. Saleh, Malvin Carl Teich						
Assessment Criteria						Number	Percent (%)
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					x	50
Instructors							
Week							
1	Introduction to optoelectronics.						
2	Beam and Wave optics						
3	Wave propagation in various media.						
4	Polarization.						
5	Fresnel equation.						
6	Electro optics.						
7	Optical materials..						
8	Optical properties of materials.						
9	Optical sources (LED, LD) and transmitters.						
10	Optical detectors and receivers.						
11	Other optical components.						
12	Integrated optics.						
13	New developments in optics.						
14							

EE -480 OPTICAL COMMUNICATION SYSTEMS					Electrical and Electronics Engineering		
Semester	Teaching Methods					Credits	
	Lecture	Recite	Lab.	Other	Total	Credit	ECTS Credit
7	45				55	100	3
Language	Turkish						
Compulsory / Elective	Elective						
Prerequisites	No						
Course Contents	Introduction. Historical development. Wave propagation in cylindrical fiber. Optical waveguides. Transmission characteristics of optical fibers. Fiber types (SMF, MMF), Optical receivers and transmitters. Coherent communication systems. Fiber fabrication methods. Design of optical communication systems. Multiplexing and modulation techniques in optical communication systems						
<u>Course Objectives</u>	To give basic information about optical communications systems.						
<u>Learning Outcomes and Competences</u>	The student can understand the fundamental concepts of optical communications systems						
Textbook and/or References	Textbook: Prof. Dr. Sedat ÖZSOY, Fiber Optik, Birsen Kitabevi References Allen H. Cherin, "Introduction to Optical Fibers", McGraw Hill College Div, 1983. Govind P. Agrawal, "Fiber Optic Communication Systems", Wiley Interscience.						
Assessment Criteria						<i>Number</i>	<i>Percent (%)</i>
	Midterms					x	50
	Quizzes						
	Homework						
	Projects						
	Term works						
	Laboratory						
	Other						
	Final					x	50
Instructors							
Week							
1	Introduction.						
2	Historical development.						
3	Optical waveguides.						
4	Wave propagation in planar waveguides.						
5	Wave propagation in cylindrical fiber.						
6	Modal analysis of optical fibers.						
7	Transmission characteristics of optical fibers.						
8	Fiber types (SMF, MMF),						
9	Optical receivers and transmitters.						
10	Coherent communication systems.						
11	Fiber fabrication methods.						
12	Design of optical communication systems.						
13	Multiplexing and modulation techniques in optical communication systems						
14	New Developments in optical communication systems						

EE-436 Electric Motor Drives					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4	8
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Classification of motor drives and the principle of the motor drives. The DC motor drive systems, The phase-controlled dc motor drives for variable-speed operation. The chopper-controlled dc motor drive systems. The principle of the four-quadrant operation, to examine the DC motor drives and to practice the dc motor drives, Classification of AC motor drives, The 3-phase full bridge inverter, The PWM inverters, The hysteresis current controlled inverters, Multilevel inverters, The practical application of inverter, Brushless DC motor and Permanent Magnet Synchronous Motor Drives, The practical application of Brushless DC motor and Permanent Magnet Synchronous Motor Drives, Stepper motor and reluctance motor drives. The efficiency, the energy saving principles and the application of these drives								
Course Objectives	Electric motor drive to introduce the general principles to be presented								
Learning Outcomes and Competences	Motor drivers will have detailed information about the motor makes and implements the appropriate driver for the selection								
Textbook and /or References	1. R. Krishnan, " Electric Motor Drives: Modeling, Analysis, and Control", Prentice Hall; United States ed edition (February 25, 2001) .								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Classification of motor drives and the principle of the motor drives.								
2	The DC motor drive systems,								
3	The phase-controlled dc motor drives for variable-speed operation,								
4, 5	The chopper-controlled dc motor drive systems,								
6, 7	The principle of the four-quadrant operation, to examine the DC motor drives and to practice the dc motor drives,								
8	Classification of AC motor drives, The 3-phase full bridge inverter,								
9	The PWM inverters, The hysteresis current controlled inverters,								
10	Multilevel inverters, The practical application of inverter,								
11	Brushless DC motor and Permanent Magnet Synchronous Motor Drives,								
12	The practical application of Brushless DC motor and Permanent Magnet Synchronous Motor Drives,								
13	Stepper motor and reluctance motor drives.								
14	The efficiency, the energy saving principles and the application of these drives								

EE-438 Electrical Windings Techniques					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4	8
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Introduction to fundamental theory of electrical machinery, like current, voltage, power, power factor, number of pole, number of rotation, connection type. DC and AC machines, armature and pole winding, the methods of winding types and drive of diagrams, application on machines, troubleshooting and repair								
Course Objectives	1. Learning of the electrical machines of winding techniques and applications 2. Troubleshooting and repair on this machines								
Learning Outcomes and Competences	1. Know physical construction of electrical machines and make pull up or assemble this machines. 2. examination any electrical machine if it is out of order and repair 3. Know procedure of test performance 4. Prepare any electrical machines project and application								
Textbook and /or References	1. Course notes prepared by the instructor 2. Elektrik Makineleri Sargı tekniği I ve II. Necmettin Tirben, Y.T.Ö.O. 1975 3. Electric Motor Repair, Robert Rosenberg, Rinehart & Company, Inc, New York								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Machines, armature and pole winding, the methods of winding types, estimation of troubleshooting and repair, general information about lamination.								
2	Make field coil winding and assemble on the machine, test field coil.								
3	Prepare any armature for winding								
4, 5	Parallel and serial winding								
6, 7	AC machines, induction motors, frame, principles of work, examinations, to pull up and to assemble, rewinding and reconnecting								
8	One layer stator winding								
9	Make one layer winding in the stator slots								
10	Two layer winding								
11	Make two layer winding in the stator slots								
12	Two-speed motors and their windings								
13	Make winding one phase motor								
14	Fraction windings								

EE- 440 Dynamics of Electrical Machines					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Basic concepts. Dynamic behaviour, mathematical and circuit models, transfer functions, block diagrams, and dynamic response of DC machines. Mathematical models at the d-q-0 coordinate system, per-unit quantities, and numerical simulations of synchronous machines. Mathematical models at variable reference coordinate systems, per-unit quantities, and numerical simulations of induction machines.								
Course Objectives	Dynamic equations of the interests of electrical machines								
Learning Outcomes and Competences	Students taking this course raises electricity makinelarının dynamic equations and makes analysis. It also examines the permanent and temporary work in the regime.								
Textbook and /or References	1. C. Ong, Dynamic Simulation of Electric Machinery Using MATLAB/SIMULINK, Prentice Hall, 1998. 2. I. Boldea, S. A. Nasar, Linear Electric Actuators and Generators, Cambridge University Press, Cambridge, 1997. 3. P.C.Krause, O.Wasynczuk, Electromechanical Motion Devices, Mc Graw Hill, 1989.								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Basic concepts.								
2	Dynamic behaviour, mathematical and circuit models, transfer functions, block diagrams, and dynamic response of DC machines.								
3	Dynamic behaviour, mathematical and circuit models, transfer functions, block diagrams, and dynamic response of DC machines.								
4, 5	Mathematical models at the d-q-0 coordinate system, of synchronous machines.								
6, 7	Mathematical models at, per-unit quantities, of synchronous machines.								
8	Numerical simulations of synchronous machines.								
9	Speed control of synchronous machines								
10	Mathematical models of induction machines								
11	Mathematical models at variable reference coordinate systems, of induction machines.								
12	Mathematical models at, per-unit quantities, of induction machines.								
13	Numerical simulations of induction machines								
14	Speed control of induction machines.								

EE -423 Electric Machines Laboratory I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.	Project	Homework	Other	Total	Credit	ECTS Credit
7			30			70	100	1	2
Language	English								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Experiments of basic transformer (examine and find to polarity, winding turn, no load, short circuit, leakage reactance). DC generator experiments (characteristic of the exterior excitation DC generator, no load study of the exterior excitation DC generator, characteristic of the shunt DC generator, no load study of the shunt DC generator)and DC motor experiments (characteristic of exterior of the shunted DC motor, find to exterior and moment characteristic serial DC motor, find to exterior and moment characteristic compound DC motor).								
Course Objectives	Operation of electrical machines to learn. Connections made.								
Learning Outcomes and Competences	Students who successfully complete this course, direct current machines, features and connections of transformers and learns.								
Textbook and /or References	<ul style="list-style-type: none"> •1. GÜNGÖR BAL, Doğru Akım Makinaları ve Sürücüleri •2. GÜNGÖR BAL, Transformatörler 3. G.R.Slemon, Electric Machines and Drives, Addison Wesley 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Examine and find to polarity of transformer								
2	Find to winding turn transformer								
3	Examine no load, short circuit leakage reactance of transformer								
4	Characteristic of the exterior excitation DC generator.								
5	No load study of the exterior excitation DC generator								
6	Characteristic of the shunt DC generator								
7	No load study of the shunt DC generator								
8	Characteristic of exterior of the shunted DC motor								
9	Characteristic of exterior of the shunted DC motor								
10	Find to exterior characteristic serial DC motor								
11	Find to moment characteristic serial DC motor								
12	Find to exterior compound DC motor								
13	Find to exterior characteristic compound DC motor								
14	Find to moment characteristic compound DC motor								

EE -431 ENERGY TRANSMISSION-I					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Selection of conductors for transmission lines. Calculations of transmission line apparatus in terms of mechanical strength and over voltages. Computation of protection angle and chain curve for high voltage transmission lines. Calculation of sagging and methods for proper conductor sagging. Line tow and span calculations, and additional loads on power transmission lines. Distances between towers and related calculations. Economical and critical distance computations. Design and construction of towers. Steel and concrete towers and computations. Earthling resistance on transmission lines. Introduction to transmission system stability.								
Course Objectives	To teach the computational methods in the design of high voltage transmission lines and towers.								
Learning Outcomes and Competences	Provide with the capability to prepare projects for high voltage energy transmission line .								
Textbook and /or References	<ol style="list-style-type: none"> 1. K. UÇKU, Elektrikle Enerji Dağıtımı ve Projesi, Tisa matbaacılık sanayi Ankara. 2. Y. SANER, Güç Dağıtımı, Birsen Yayınevi, 3. G. CARLE, Elektrik hatlarının ve şebekelerinin hesaplanması, Çeviren 4. Prof.Dr. M. Bayram, İ.T.Ü kütüphanesi sayı478 5. SIEMENS, Electrical Engineering hand book. 6. H.Hüsnü DENGİZ “Enerji Hatları Mühendisliği” 7. PEŞİNT M. A., Elektrik Santralleri Enerji İletimi ve Dağıtımı, MEB Yayınları , İSTANBUL 1992. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
Final Exam							X	50	
Instructors									
Week	Subject								
1	Introduction (High voltage transmission lines , using conductors and towers at transmission lines)								
2	Selection of conductors for transmission lines – Calculations of transmission line apparatus in terms of mechanical strength and over voltages								
3	Computation of protection angle for high voltage transmission lines –chain curve statement.								
4, 5	Elevation difference between suspension points and co-ordinates of suspension points –Length of chain curve								
6, 7	Tension at suspension points – Tension of conductor at horizontal tangent point – Examples and Solutions.								
8	Calculation of sagging and methods for proper conductor sagging – Examples and Solutions Midterm Exam								
9	State formula – Examples and Solutions.								
10	Distances between towers and related calculations. (Ruling span – Critical span – Critical temperature) Examples and solutions								
11, 12	Calculation of wire stringing – Insulator off-sets								
13	Towers, loads on energy transmission lines and towers								
14	Calculation of steel towers – Example and Solution								
15	Concrete towers and computations – Earthling resistance on transmission lines – Introduction to transmission system stability								

EE-311 SENSORS AND TRANSDUCERS					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Definition of Energy, Energy transformation, basic six energy transformation, general concepts and specifications of transducers. Industrial development for sensors and transducer. Temperature measurement, humidity measurement, tension measurement, acceleration measurement, linear and angular displacement measurement, measurement of fluid pressure and speed, level measurement, measurement of motor speed and position, logarithmic differential, photo transducers, proximity sensors, security aimed sensors, robotic sensors, biomedical and chemical sensors. Transducer and sensors experiment.								
Course Objectives	To introduce the students in the applications of the basic industrial transducers. A working knowledge of the industrial transducer and sensors								
Learning Outcomes and Competences	Students completing EE-311 will have: A working knowledge of the industrial transducer and sensors To introduce the students to basic energy transform in electrical energy, chemical energy, kinetic energy, mechanical energy, heat, potential energy. . To introduce the students to relevant applications of transducers and sensors. To develop the students ability to apply for industrial applications								
Textbook and /or References	<ol style="list-style-type: none"> 1. Algılayıcılar Dönüştürücüler, Osman Gürdal, Nobel Yayın Dağıtım, 2000. 2. Measurement Systems: Application and Design, Doebelin, E.O., McGraw-Hill 3. Sensors and Transducers, Ian Sinclair, Newnes, 2001. 4. Sensors And Transducers, Patranabis D. Write, Prentice-hall, 2008. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Definition of Energy,								
2	Energy transformation, basic six energy transformation								
3	General concepts and specifications of transducers.								
4, 5	Industrial development for sensors and transducer.								
6	Temperature measurement, humidity measurement and experiments								
7	Tension measurement, acceleration measurement and experiments								
8	Linear and angular displacement measurement and experiments. Midterms.								
9	Measurement of fluid pressure and speed, level measurement and experiments								
10	Measurement of motor speed and position and experiments								
11	Photo transducers and experiments								
12	Proximity sensors and experiments								
13	Security aimed sensors and experiments								
14	Robotic sensors and experiments								
15	Chemical and biomedical sensors and experiments								

EE --433 HIGH VOLTAGE TECHNIQUES					Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits		
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	I-V characteristics of gases. Electron emission processes. Ionization and deionization. Townsend and Streamer breakdown mechanisms. :Breakdown in electronegative gases. Corona discharges and loses. Breakdown mechanisms in solid and liquid insulations. Generation of A.C. D.C. and impulse voltages.								
Course Objectives	To teach the computational methods in the design of high voltage transmission lines and towers.								
Learning Outcomes and Competences	Provide with the capability to prepare projects for high voltage energy transmission line .								
Textbook and /or References	<ol style="list-style-type: none"> 1. Elements of power system analysis: William D. Stevenson, J .McGraw-Hill, 1982 ISBN: 0-07-061278-1 2. Power System Analysis: John J. Grainger and William D. Stevenson, J. R. McGraw-Hill, 1994 ISBN: 0-07-061293-5 3. Power System Analysis: A. R. Bergen and V. Vittal, Prentice Hall Limited, 2000 ISBN: 0-13-691990-1 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Introduction to High Voltage Techniques.								
2	Electron emission mechanisms								
3	Current – Voltage relationships in gases, free and mean free path of particles								
4, 5	Electron avalanches mechanisms and ionization growth in gases								
6, 7	Secondary processes and Townsend’s breakdown mechanisms								
8	Paschens law and Paschens curve. Calculation of breakdown voltages.								
9	Attachment processes and ionization growth current in electronegative gases .								
10	Insulation property of Electronegative gases and breakdown mechanisms.								
11, 12	Partial discharges and corona.								
13	Breakdown mechanisms in liquid and solid dielectrics.								
14	Generation of high voltages.								
15	Generation of high voltages.								

EE-408 Industrial Applications of Power Electronics				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Double direction inverters, Multilevel inverters, Dynamic and static regulators, Resonant power converters, Electronic ballasts, Induction heating, Active power factor correction circuits, Active filters, Dynamic compensation systems,							
Course Objectives	This course is designed to equip students with knowledge about the power electronics system which are used in double direction inverters, multilevel inverters, voltage regulators, resonant power converters, induction heating systems, power factor correction systems and active filters.							
Learning Outcomes and Competences	To obtain the information about power electronics system which are used in double direction inverters, multilevel inverters, voltage regulators, resonant power converters, induction heating systems, power factor correction systems and active filters.							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Double direction inverters,							
2	Multilevel inverters,							
3	Cascaded multilevel inverters,							
4	Neural point clamped multilevel inverter, Flying capacitor multilevel inverter,							
5	Dynamic and static regulators,							
6	Resonant power converters,							
7	Serial, parallel, serial-parallel resonant power converters,							
8	Electronic ballasts,							
9	Induction heating,							
10	Active power factor correction circuits,							
11	Circuit topologies and control techniques,							
12	Active filter circuits,							
13	Serial and parallel active filters, circuit topologies and control techniques							
14,15	Dynamic compensation techniques							

EE-432 Energy Distribution				Electric Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Subjects of Energy Distribution, Types of energy distribution networks, Radial and interconnected networks, Planning and automation, Load characteristics, Calculations of voltage drops and power losses, Underground cables and thermal limitations, Calculation of cross section area according to different criteria, Short circuit and bus calculations, power factor correction in energy distribution networks, Transformer centre equipments							
Course Objectives	This course is designed to equip students with knowledge about the energy distribution subjects such as network types, cross section area, short circuit calculations, equipments of transformer centers.							
Learning Outcomes and Competences	To obtain the information about the energy distribution subjects such as network types, cross section area, short circuit calculations, equipments of transformer centers.							
Textbook and /or References	<ul style="list-style-type: none"> • Seip G.Günter, “Electrical Installations Handbook”, John Wiley & Sons, 2000. • Bayliss C.R., “Transmission and Distribution Electrical Engineering”, Newnes, Second Edition, 1999. • F.McPartland et al., “Handbook of Electrical Construction Calculations”, McGraw-Hill, 1998. • Gönen T., “Electric Power Distribution System Engineering”, McGraw-Hill, 1986. • Alperöz N., “Elektrik Enerjisi Dağıtımı”, Nesil Matbaacılık ve yayıncılık,1987. • Güç Dağıtımı (Enerji Dağıtımı) 1-2, Yetkin Saner, Birsen Yayınevi,2000. 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam						x	50
Instructors								
Week	Subject							
1	Subjects of Energy Distribution							
2	Types of energy distribution networks,							
3	Radial networks,							
4	Interconnected networks,							
5	Planning and automation,							
6	Load characteristics,							
7	Calculations of voltage drops,							
8	Calculations of power losses,							
9	Underground cables and thermal limitations							
10	Calculation of cross section area according to different criteria,							
11	Short circuit calculations							
12	Bus calculations							
13	Power factor correction in energy distribution networks,							
14,15	Transformer centre equipments							

EE-473 Power Electronics				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
7.	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Scope of power electronics and industrial applications, Specifications and principles of semiconductor switches Diode SCR, BJT, MOSFET, Triac, GTO, MCT and IGBT, Operation principles, properties and types of rectifiers, Half/Full wave single phase and multiphase controlled/uncontrolled rectifiers, resistive and inductive operations of rectifiers, Operation principles, properties and types of AC choppers, resistive and inductive operations of AC choppers, Operation principles, properties and types of inverters, Single phase and multiphase square wave and sinusoidal inverters with resistive and inductive loads. Operation principles, properties and types of DC-DC converters, Power losses in semiconductor circuits and circuit equipments, Basic control and protection systems.							
Course Objectives	This course is designed to equip students with knowledge about scope and applications of power electronics, power semiconductor switches, basic concepts and design methods of line commutated rectifiers, DC-DC converters and inverters.							
Learning Outcomes and Competences	To obtain the information about scope and applications of power electronics, power semiconductor switches, basic concepts and design methods of line commutated rectifiers, DC-DC converters and inverters.							
Textbook and /or References	<ul style="list-style-type: none"> Power Electronics, Lander, 3rd. Ed., Mc Graw Hill Power Electronics: Converters, Applications and Design, Mohan, Undeland and Robbins, 2nd Ed., John Wiley and Sons Power Electronics: Circuits, Devices and Applications, M. Rashid, Prentice Hall Elements of Power Electronics, Philip T. Krein, Oxford university pres 							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterm Exams						X	50
	Quizzes							
	Home works							
	Projects							
	Term Paper							
	Laboratory Work							
	Other							
Final Exam						x	50	
Instructors								
Week	Subject							
1	Scope and industrial applications of power electronics,							
2	Operation principles and properties of Diode, SCR, BJT, MOSFET, Triac, GTO, MCT and IGBT power semiconductor switches,							
3	Operation principles, properties and types of rectifiers, Single phase half and full waverectifiers, single phase and multiphase controlled/uncontrolled rectifiers, resistive and inductive operations of rectifiers,							
4	Three phase half wave rectifiers, Three phase full wave rectifiers,							
5	Single phase controlled rectifiers,							
6	Three phase controlled rectifiers,							
7	Single and three phase AC choppers,							
8	Single and three phase square wave inverters, resistive and inductive operation of inverter,							
9	Single and three phase stepped wave inverters, resistive and inductive operation of inverter,							
10	Single and three phase sinusoidal inverters, resistive and inductive operation of inverter,							
11	DC-DC converters, Buck converters,							
12	Boost converters, Buck-boost converters							
13	Cuk converter, Sepic converter,							
14,15	Power losses in semiconductor circuits and circuit equipments, basic control and protection systems.							

EE- 442 ELECTRIC PLANT PROJECT					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8	45					55	100	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Electric mountain plant projects, 34.5 kV overhead line and at the same voltage level underground cable network with a ring-type feeder automation of the project, the necessary mechanical and electrical accounts for one-line diagrams, power projects, lighting projects, conductor cross-section of accounts; On-off, protection and measuring elements; Column charts and installation rulers; motaj details and materials; Reports								
Course Objectives	Learning the process of designing the electrical facilities to ensure								
Learning Outcomes and Competences	34.5 kV overhead and underground line hood can be projected. Perform mechanical and electrical calculations								
Textbook and /or References	1. Practical electrical project engineering, L.B. Roe, McGraw-Hill, 2006. 2. Electrical Project Management, McGraw-Hill, 1984.								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Mountain resort project and the content of electricity								
2,3	34.5 kV overhead feeder lines and projecting automation								
4,5	34.5 kV underground cable network with a ring type of feeder automation project								
6	Mechanical and electrical accounts								
7	One-line schemes								
8	Power projects								
9	Lighting projects								
10	Conductor cross-section of accounts								
11	On-off, protection and measuring elements								
12,13	Column charts								
14	Load rulers								
15	Motaj and material details								

EE-406 SPECIAL ELECTRICAL MACHINES					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
8	45						45	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Synchronous-asynchronous motor. Double-fed asynchronous motor. High-frequency motors. Linear machines. Engine braking. External rotor motors. Vibration motors. Drum motors. Multi-phase commutator motors. Schrage motor. Single-phase commutator motors. Hysteresis motors. Electric motors for flammable environments. Step motors. Reluctance and Switched Reluctance Motors. DA Brushless Motors. Servo motors.								
Course Objectives	Structures and uses of special electrical machines are provided to learn								
Learning Outcomes and Competences	Engines can detect structural differences. Selection of appropriate motor workspace can be done								
Textbook and /or References	1. Özel Elektrik Makinaları (2. Baskı), Everest Yayınları , Güngör Bal ,2004								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Synchronous-asynchronous motor								
2	Double-fed asynchronous motor								
3	High-frequency motors								
4	Linear machines								
5	Braking motors								
6	Schrage motor								
7	Single-phase commutator motors								
8	Hysteresis motors								
9	Electric motors for flammable atmospheres								
10,11	Step motors								
12	Reluctance and Switched Reluctance Motors								
13,14	Brushless DC Motors								
15	Servo motors								

EE-331 INDUSTRIAL COMMUNICATION TECHNIQUES					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45						45	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								
Course Contents	Data communication systems, digital signal processing methods, computer communications networks, satellite and mobile communication systems, radio / TV systems, radio communication systems, wireless communications, fiber optic communications, industrial control protocols, and computer integrated manufacturing model, real-time systems and communication protocols (RS232, RS485, USB, Ethernet, CANbus, Profibus, Modbus), network structure and applications								
Course Objectives	Data communication systems and data communications are intended to learn								
Learning Outcomes and Competences	Computer communications networks will understand. Satellite and mobile communication system selects								
Textbook and /or References	1. Y Kaplan. Veri haberleşmesi temelleri papatya yayıncılık, 2002.								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Data communication systems								
2	Digital signal processing methods								
3	Computer communications networks								
4	Satellite and mobile communication systems								
5	Radio and tv systems								
6	Wireless communication systems								
7	Computer integrated manufacturing model								
8	RS232, RS485								
9	USB,								
10	Ethernet,								
11	Canbus								
12	Profibus								
13	Modbus								
14,15	Network structure and applications								
EE-329 COMPUTER AIDED DESIGN					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45						45	3	3
Language	Turkish								
Compulsory / Elective	Compulsory								
Prerequisites	No								

Course Contents	Electrical / Electronic circuit design with the overall structure of the program package can understand, the program package can be designed using the program package using the circuit analysis can make. To prepare a printed circuit board		
Course Objectives	Circuit design with the ability to use programs to give the package		
Learning Outcomes and Competences	Electrical / electronic circuit element recognizes. It gains the ability to benefit from the program library. Printed circuit board may issue the appropriate circuit analysis		
Textbook and /or References			
Assessment Criteria		If any, mark as (X)	Percent (%)
	Midterm Exams	X	50
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work		
	Final Exam	X	50
Instructors			
Week	Subject		
1,...,4	Electrical / Electronic circuit design and general structure of the program package Understanding		
5,6	Using the program package design can be done		
7,8	Using the circuit analysis program package can be done		
9,15	To prepare a printed circuit board		

EE-439 Design of Electric Machinery					Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits			
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit	
7	45					55	100	3	4	
Language	Turkish									
Compulsory / Elective	Elective									
Prerequisites	No									
Course Contents	Electric Engineering Equipment. Heating and cooling of Electric Machinery. Concept of designing electric machines. Design of transformation. Design of DC Machines. Design of induction motor. Design of permanent magnet machines. PC aided design of electric machines.									
Course Objectives	To develop analyzing capability of students and preparing academics background of engineering courses									
Learning Outcomes and Competences	The student that took this lecture will gain proficiency of electric machinery									
Textbook and /or References	<ul style="list-style-type: none"> • Elektrik Makinalarının Tasarımı, Osman Gürdal, Atlas Yayın Dağıtım, 2001. • Electrical Machine Design - The Design And Specification Of Direct And Alternating Current Machinery, Alexander Gray, Gray Pres, 2007. • Design of Rotating Electrical Machines, Juha Pyrhonen, Tapani Jokinen, Valeria Hrabovcova, Wiley pres, 2009. 									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homeworks									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
	Final Exam						X	50		
Instructors										
Week	Subject									
1	Electric Engineering Equipment.									
2	Heating and cooling of Electric Machinery									
3	Concept of designing electric machines									
4,5	Design of transformation									
6,7,8	Design of DC Machines									
9,10	Design of induction motor									
11,12	Design of permanent magnet machines									
13, 14, 15	PC aided design of electric machines									

EE-409 Mechatronics and Robotics					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45					55	100	3	4
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	The basic concepts of mechatronics engineering, control systems, mathematical foundations (complex numbers, Laplace transform, z transform, matrix algebra), transfer functions, block diagrams, signal flow diagrams, mathematical modeling of physical systems, state-variable analysis, stability of linear control systems, time-domain analysis of control systems, root-locus technique, frequency-domain analysis, design of control systems. Sensors and transducers, performance terminology, displacement, position and proximity sensors, velocity and motion sensors, force sensors, fluid sensors, liquid flow and liquid level sensors, temperature sensors, thermocouples, light sensors, encoders and tachometers, selection of sensors.								
Course Objectives	To develop analyzing capability of students and preparing academics background of engineering courses								
Learning Outcomes and Competences	The student that took this lecture will gain proficiency of starting mechatronic								
Textbook and /or References	<ul style="list-style-type: none"> Robotics, mechatronics, and artificial intelligence, Newton C. Braga, Elsevier, 2002. Mechatronics, V.S. Bagad, Technical Publications Pune, 2008. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Manipulator configurations.								
2	3-D Space and Transform Matrices.								
3	Manipulator kinematics.								
4, 5	Inverse kinematics.								
6, 7	Manipulator-velocity relations.								
8	Robot simulations.								
9	Approximation and conservation of bumps.								
10	Orbit planning.								
11, 12	Duty planning								
13	Robot programming languages.								
14	Off-line programming.								
15	Robosim simulation programme and applications.								

EE 407 MICROCONTROLLERS-II					Electrical and Electronics Engineering					
Semester	Teaching Methods						Credits			
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit	
7	45					55	100	3	4	
Language	Turkish									
Compulsory / Elective	Compulsory									
Prerequisites	No									
Course Contents	Explain of basic interface concepts. Be able to apply series and parallel input-output, Connection with environmental elements. Explain of interrupts and can write interrupt sub-programs. Using ADC and DAC for microcontroller application with C programming. Design of systems which pressure, temperature and humidity systems with microcontrollers for industrial application.									
Course Objectives	The goal of the course is to expand the knowledge and practice the student has had during the first term EE-301 course and to introduce the embedded systems, With the content of the course we are here introducing a more advanced microprocessor system from Intel. The benefit of trying out the code on a PC platform is extremely nice thus the student can see the results of the program with a great convenience of working on a PC. The course introduces different modern ways of addressing possibilities. In addition serial/parallel communication protocols with programmable peripheral devices are introduces. The external programmable devices ranging from programmable interrupt controllers to counters are also introduced in this course. While doing all these the student, away from memorizing document sheets, will instead concentrate on the efficiency on the hardware and software design.									
Learning Outcomes and Competences	To give basic information about hardware and software of the microprocessors. To learn the design and programming of microprocessor controlled system. Ability to explain the physical operation of microcontroller device. Ability to improve the program models of electronic systems.									
Textbook and /or References	<ol style="list-style-type: none"> 1. Introduction to Microprocessors and Microcontrollers, John Crisp, Elsevier, 2004. 2. Microprocessor Design: A Practical Guide from Design Planning to Manufacturing (Professional Engineering), Grant McFarland 3. Analog Interfacing to Embedded Microprocessor Systems, Second Edition (Embedded Technology Series) (Paperback), Stuart Ball, Elsevier. 4. Embedded Design with The PIC18F452 Microcontroller, John B. Peatman, 2003. 									
Assessment Criteria							If any, mark as (X)	Percent (%)		
	Midterm Exams						X	50		
	Quizzes									
	Homeworks									
	Projects									
	Term Paper									
	Laboratory Work									
	Other									
Final Exam						X	50			
Instructors										
Week	Subject									
1	Programmable interface devices.									
2	Interfacing with handshake signals and interrupt									
3	Multipurpose programmable devices Programmable keyboard/display interface									
4, 5	General purpose programmable peripheral devices. Bidirectional data transfer between two microcomputers									
6	Programmable interval timer									
7	Midterm-I									
8,9	Programmable interrupt controller									
10	Direct memory access and DMA controller. Standards in serial I/O									
11, 12	Software and hardware controlled serial I/O									
13	Basic technological and operational principles of some data storage and peripheral devices									
14	Working strategies and applications of LCD and GLCD									
15	Usage of Keypad and GLCD for serial communication.									

SS 313 COMMUNICATION ART					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Explanation of interpersonal communication, communication model, communication elements and features, active listening and feedback, the elements that prevents interpersonal communication (source, channel, receiver), the elements that makes communication easy, the role of emotions and their usage in communication, conflict in communication and its prevention, important elements of student, teacher, parent communication, application of communication.								
Course Objectives	Interpersonal communication methods and communication model, communication elements and features, active listening and feedback, the elements that prevents interpersonal communication are wished to be learnt.								
Learning Outcomes and Competences	Define interpersonal communication. Learn communication model, communication elements and features. Illustrate the elements that prevent interpersonal communication. Evaluate the elements that make communication easy, the role of emotions and their usage in communication. Debate conflict in communication and its prevention. Illustrate listening and feedback.								
Textbook and /or References	Dökmen,Ü., İletişim Çatışmaları ve Empati, Ankara, 2000 Abacı,R., Yaşamın Kalitelendirilmesi, Form Stil Yayıncılık, İstanbul, 2005								
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Explanation of interpersonal communication								
2	Explanation of interpersonal communication, communication model								
3	Explanation of interpersonal communication, communication model, communication elements and features								
4	Active listening and feedback								
5	The elements that prevents interpersonal communication (source, channel, receiver),								
6	The elements that makes communication easy, the role of emotions								
7	The role of emotions								
8	Mid-term								
9	The role of emotions their usage in communication								
10	The conflict in communication and its prevention								
11	The important elements in communication with student								
12	The important elements in communication with teacher								
13	The important elements in communication with parent								
14	The application of communication.								

SS 309 SERAMİK				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	This course covers period until converting clay to ceramic product.								
Course Objectives	This discipline is aimed giving techniques at beginning level needed shaping as taken notice plastics of ceramic materials.								
Learning Outcomes and Competences	To recognize tools and machines used in ceramic shaping. To learn using tools and machines used in ceramic shaping. To learn free ceramic shaping techniques. To do research about ceramic subjects.								
Textbook and /or References	The Big Book Of Ceramics Joaquim CHAVARRIA The Potter's Manual Kenneth CLARK Working With Clay Susan PETERSON Contemporary Ceramic's Susan PETERSON Two-In-One Manuals Ceramics Steve MATTION Anadoluda Yaşamakta Olan İlkel Çömlekçilik Güngör GÜNER								
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Introducing of ceramic paste and doing suitable for shaping								
2	Core technique is explained as practiced and required repeat from students.								
3	Application working of learned techniques: Evaluating of esquisse workings and converting designs to forms.								
4	Shaping technique with wheel throwing: clay preparing, centering at wheel throwing.								
5	Basic shaping techniques with wheel throwing: Cylinder drawing.								
6	Bottom cleaning work: Bottom cleaning technique of works shaped at wheel throwing.								
7	Continuing to bottom cleaning and retouching applications.								
8	Mid-term								
9	Copy working, free shaping technique, subject natural object.								
10	Natural object out form designs: A work oriented to have miscellaneous forms beginning natural objects.								
11	Evaluating of natural object and natural object output forms								
12	Presentation as a file of esquisse of all workings								
13	Oven placing and biscuit firing.								
14	Glazing and glaze firing.								

SS 307 TRADITIONAL TURKISH HANDCRAFT				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Glazed Tile, Illumination, Hand Drawings, Carpet-Rug-Old Fabric, Binder, Calligraphy, Marbling, Miniature, Wood, Mine, Stone work as examining according to historical and artistic will be examined theoretically. Taken place in traditional Turkish handicrafts; Glazed Tile, Illumination, Hand Drawing, Carpet-Rug-Old Fabric, Binder, Calligraphy, Marbling, Miniature, Wood, Mine, Stone work will be examined according to chronological line as theoretical discussing for the purposes of historical and artistic								
Course Objectives	It is aimed training of students with theoretical and visual education methods related to art works produced in historical evolution of Traditional Turkish Handicrafts and bringing in protection competency of cultural properties.								
Learning Outcomes and Competences	Traditional Turkish Handicrafts recognizing and interpreting. Determining common points between art branches and sub-disciplines and being composed of an authoritarian view-point depend on it. Recognize of national culture properties. For practiced art branches, having a wide perspective improving. Settling of actual faults or until coming today ones in terms of cultural values and making society manage of this subject. To applying of in scientific and academic environment of interaction at other branches of traditional Turkish handicrafts during artistic activities.								
Textbook and /or References	Metin And, Osmanlı Tasvir Sanatları, Cilt I, İş Bankası Yay., İst. 2002 Oktay Aslanapa, Türk Halısının Bin Yılı, Eren Yayınevi, 1987 Doğan Kuban, Selçuklu Çağında Anadolu Sanatı, Yapı Kredi Yay., Ekim, 2002. Doğan Kuban, Divriği Mucizesi, YKY. Cahide Keskiner, Türk Süsleme Sanatlarında HATAYİ, Kültür Bakanlığı sanat eserleri, Ankara 2002.								
Assessment Criteria								Number	Percent (%)
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors									
Week									
1	Information publications and periodicals about the Course.								
2	Subjects to be taught at the course, suggesting of thesis subjects related to miscellaneous art branches within year								
3	to students								
4	Technical rules related to homeworks preparing of course subjects and selection of subjects for preparation of								
5	thesis working.								
6	Areas established of Turkish States at history and Areas spread of Turkish Art Works.								
7	Turkish Art and Characteristic features of Art Works made in Turkey.								
8	Tradition of “nakişhane” seen on Turkish states, art branches and craftsmen groups at “nakişhane”.								
9	Establishment workings of ethnography museums in Turkey and actual situation of our museums.								
10	Mid-term								

11	Improving of animal styles at Hun Art and Turkish Art.
12	Turkish migrations at Middle Asia and Uygurs' role at Turkish Art.
13	Turkish art during periods of Gaznelis, Karahans and Great Seljuks
14	Cultural and social activities of 13th century Anatolian civilizations Effect of local nations at Turkish culture. Homework evaluation.

SS 317 HUMAN RESOURCES MANAGEMENT					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	In this course the framework of human resource management and the HR functions like job analysis, HR planning, HR recruitment and selection, HR training and development will be discussed.								
Course Objectives	It is aimed to teach the theory of HRM functions at a sufficient level and to make the students gain the necessary information and ability to practice HRM functions.								
Learning Outcomes and Competences	To learn the processes of HRM functions.To understand the interaction between the HRM functions								
Textbook and /or References	1.Bingöl, Dursun. (2003) İnsan Kaynakları Yönetimi, Beta Yayınları, İstanbul. 2. Yüksel, Öznur. (1998) İnsan Kaynakları Yönetimi, Gazi Kitabevi,								
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Introduction to Human Resource Management								
2	Constituting HR Department and Introducing HR Functions								
3	Job Analysis and Job Design								
4	HR Planning								
5	HR Recruitment and Selection								
6	HR Training and Development								
7	Performance Appraisal: Context and Importance								
8	Mid-term								
9	Performance Appraisal: Process and Methods								
10	Career Planning								
11	Reward Management								
12	Job Evaluation Methods								
13	International HRM								
14	Strategic Human resources and future of HRM								

SS 315 ENGINEERING ETHICS				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Philosophical and ethical concepts, General moral principles, Human rights, Basic concepts of moral philosophy, Ethical theories, Historical development of engineering ethics, Engineering ethics codes, Ethics in design engineering, Choices and ethics in engineering profession, engineering ethics principles, Ethics in the field of engineering, Corporate ethics, management ethics, ethics and globalization, honesty and responsibility in engineering, product liability, Informed consent in engineering, Ethical approach to the solution of conflicts, Compromise, Negotiation strategies, Engineering and environment.								
Course Objectives	1. To teach the students, the importance of responsibility of the tasks they will undertake during their working life after graduation 2. As educated part of the society, to direct students to reflect their citizenship awareness to their working habits. 3. To educate graduates who have acquired knowledge to solve the ethical problems encountered in technological and scientific developments.								
Learning Outcomes and Competences	1. Will have a professional understanding 2. Will have prudent decision-making skills through the use of technical and social dimensions. 3. Will gain objective thinking ability . 4. Will be sensitive to the solution of the problems at global and national levels. 5. Will use technical infrastructure in a way that the society can be directed and can be adapted to the service of contemporary society. 6. Will gain the ability of discussing job-related issues and will gain multi-faceted thinking skills.								
Textbook and /or References	Mike W. Martin & Roland Sclinzinger, 1989, Ethics in Engineering, McGraww-Hill. C. Whitbeck, 1998, Ethics in Engineering Practice and Research, Cambridge University Press. Carl Mitcham & R. Shannon Duval, 2000, Engineering Ethics, Prentice Hall.								
Assessment Criteria								Number	Percent (%)
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Philosophical and ethical concepts, General moral principles 3								
2	Enlightenment and freedom, Human rights 1								
3	Basic concepts of moral philosophy, Ethical theories 3								
4	Historical development of engineering ethic , Engineering ethics codes, Ethics in design engineering, 1								
5	Choices and ethics in engineering profession 6								
6	Science ethics 1								
7	Ethics in the field of engineering 2								
8	Mid-term								
9	Ethics and globalization 4								
10	Honesty and responsibility in engineering 5								
11	Product liability, Informed consent in engineering 1								
12	Ethical approach to the solution of conflict 2								

13	Compromise, Negotiation strategies 6
14	Engineering and environment. 4

SS 305 CINEMA				Electrical and Electronics Engineering						
Semester	Teaching Methods							Credits		
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit	
5	30					70	100	2	3	
7Language	Turkish									
Compulsory / Elective	Elective									
Prerequisites	No									
Course Contents	To show students the main features of the possible social impact of cinema and television as mass communication tools. To introduce students to the main features of the cinema television production process and to the team members taking part, To illustrate approximately cinema television's technical peculiarities and enable the students grasp the technical difference between cinema and TV, Enable them to have an idea on varieties of types of cinema, To illustrate the main points in forming a composition in cinema television.									
Course Objectives	To enable section students to get acquainted with the social, structural, artistic and technical peculiarities of cinema and television.									
Learning Outcomes and Competences	<p>1-To be able to introduce mass and mass communication tools, to explain by citing examples concepts such as cinema and television's social impact on commercials, consumer culture, cultural industry, disinformation, polyphony illusion and fictional veracity.</p> <p>2-To list in order the elements making up the production process, to illustrate the phases composed by the production process, to explain how this process functions by giving examples, to specify those serving in this process, to illustrate the qualitative differences between cinema and television from point of view of the persons involved.</p> <p>3-To enable distinguishing between camera, film camera and television camera, describe the sections of the camera, lens angles, focus length, diagram, depth of space and explain how they change, explain the general lighting method and basic tenets of lighting, describe audio and microphone and recognize the varieties, understand reasons for editing, know the meanings of insert, cut away, edit and distinguish between cinema and television editing.</p> <p>4-To distinguish between traditional narrative and contemporary narrative and explain their peculiarities.</p> <p>5- To list shooting criteria, camera angle, camera movements, image arrangement, action line, and how to remove the action line</p>									
Textbook and /or References	<p>Society and Communication: Editor: Prof. Dr. Nazlı Bayram, Anadolu University Publications, Sept. 2007</p> <p>Pres and Publishing Techniques in Public Relations, Editor: Asst. Prof. Dr. Rüyeyde Akyürek, Anadolu University Publications, Dec. 1999</p> <p>Script Writing, William Miller, Anadolu University Publications, 1993</p> <p>Technical and Theoretical Basics in TV Productions, Nadi Kafalı, Ümit Publications, Nov. 2000</p> <p>Television Program Production and Management, Gürol Gökçe, Der Publications, İstanbul 1997</p> <p>The Grammar of the Film Language 1-2-3, Daniel Arijon, Kavram Publications, Oct.1995</p>									
Assessment Criteria								<i>Number</i>	<i>Percent (%)</i>	
	Midterms							x	50	
	Quizzes									
	Homework									
	Projects									
	Term works									
	Laboratory									
	Other									
	Final							x	50	
Instructors	-									
Week	-									
1	Introduction, explanation of lesson processing and the test system									

2	Communication, elements of communication, mass, mass communication, tools of mass communication, their functions, television, television broadcasting, reasons for singling out television as the most powerful tool, advertising, consumption culture, culture industry, global village, disinformation, polyphony illusion, fictional veracity, infotainment
3	Cinema, impression of the network layer, film industry, spectator-viewer, popular cinema, ways to create impressions of authenticity, film of the kind
4	Characteristics traditional narrative, watching Orson Wells' Citizen Kane movie
5	Stages formed in the traditional narrative of the productions process (research, proposal, draft, scenario, narrative outline, scenario narrative) Watching the Citizen Kane movie from this point of view and discussing it on basis of the narrated subject
6	Characters, elements determining an impressive character, examining Citizen Kane from this point of view
7	Repeating and discussing the mentioned subjects
8	Mid-term
9	Sequence, stage and shooting, view angels in contemporary narrative and camera's subjective and objective characteristics. Discussing the subject on Alfred Hitchcock's "The Birds" movie.
10	Punctuation. Issues to watch out from for in transition from one shooting to another. Discussing shooting transitions in The Birds
11	Arrangement of image, camera angels. Studying the subject on the John Ford's "Stage Coach" movie
12	Action line and triangle element. Player and camera subjects in stationary two-man shootings.
13	Television Studio. Characteristics of live and recorded broadcasting
14	Repeating and discussing the mentioned subjects

SS 311 THEATER				Electrical and Electronics Engineering					
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.			Other	Total	Credit	ECTS Credit
5	30					70	100	2	3
Language	Turkish								
Compulsory / Elective	Elective								
Prerequisites	No								
Course Contents	Since evolution Aritoteles'ten the concept of traditional theater. Theater in the basic concepts. Animation and visualization techniques. Improvisation studies. To determine the language of theater. Dramaturgy, interpretation and presentation. And efforts to promote the concept of creative drama. Creative ways to benefit from drama work in English education. English teaching techniques and to the game. The concept of the game. Psychological foundations of the game and game-learning relationship.								
Course Objectives	Since evolution Aritoteles'ten the concept of traditional theater. Theater in the basic concepts. Animation and visualization techniques. Improvisation studies. To determine the language of theater. Dramaturgy, interpretation and presentation. And efforts to promote the concept of creative drama. Creative ways to benefit from drama work in English education. English teaching techniques and to the game. The concept of the game. Psychological foundations of the game and game-learning relationship.								
Learning Outcomes and Competences	Defines the historical development of theater and drama. Explains the basic concepts of theater and drama. Explains and applies animation techniques. Applies improvisation techniques. Applies creative drama techniques. Applies drama techniques in terms of Turkish education. Scenes short-game								
Textbook and /or References	AND, Metin (2004), Başlangıcından 1983'e Türk Tiyatro Tarihi, İletişim Yayınları, 208 s. ARIKAN, Yılmaz (2007), Tiyatro ve Drama Eğitimi / İlköğretimler İçin Uygulamalı, Pozitif Yayınları. KARABOĞA, Kerem (2005), Oyunculuk Sanatında Yöntem ve Paradoks, Boğaziçi Üniversitesi Yayınevi, 282 s. ŞENER, Sevda (1998), Dünden Bugünden Tiyatro Düşüncesi, Dost Kitabevi, 328 s.								
Assessment Criteria								Number	Percent (%)
	Midterms							x	50
	Quizzes								
	Homework								
	Projects								
	Term works								
	Laboratory								
	Other								
	Final							x	50
Instructors	-								
Week	-								
1	Since the development Aritoteles'ten the concept of traditional theater.								
2	Theater in the basic concepts								
3	Animation and visualization techniques								
4	Animation and visualization techniques								
5	Improvisation work								
6	Improvisation work								
7	To determine the language of theater. Dramaturgy, interpretation and presentation								
8	Midterm								
9	And efforts to promote the concept of creative drama.								
10	Turkish teaching techniques and to a game, the game concept.								
11	Short plays staged in groups of studies								
12	Short plays staged in groups of studies								
13	Games to be staged in the classroom environment								

EE-307 Advanced Programming					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45				55	100	3	4	5
Language	Turkish								
Compulsory / Elective	Selective								
Prerequisites	No								
Course Contents	OOP Concepts and Structures, Visual C#. NET, Data Types, Variables, Operators, Control Statements, Arrays, Collection Objects, Exceptional status, Delegates, Events, File Access Input-Output Operations, Windows Forms, UML								
Course Objectives	By courtesy of this course, students learn advanced programming techniques and make practices .								
Learning Outcomes and Competences	Students taking this course knows programming databases, control over internet and programming wants special pursuit such as data transport								
Textbook and /or References	<ul style="list-style-type: none"> •C# Programlama Dili ve Yazılım Tasarımı, Ahmet Kaymaz, Papatya Yayınları •Microsoft Visual C# 3.0 For .NET Framework 3.5 (2. Baskı), Memik Yanık, Seçkin Yayıncılık 2009. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	OOP Concepts and Structures								
2	Visual C#. NET								

3	Data Types
4, 5	Variables, Operators, Control Statements
6, 7	Arrays
8	Midterm, Collection Objects
9	Exceptional status
10	Delegates, Events
11, 12	File Access
13	Input-Output Operations
14	Windows Forms
15	UML

EE-437 Monitoring and Protection of Power Systems				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Principles of protection, Voltage and current sensors, High current, differential and impedance protection systems, Transformers, generators and line protection systems, Operation and managing power systems, Introduction to power system modeling, Computer based control of power systems, Necessity of data transmission in power systems, Remote reading, operating, controlling, protecting and managing, Communication environment for power system applications.							
Course Objectives	Teaching the fundamental concepts and principles of power system concepts, giving general knowledge to students about the protection and monitoring.							
Learning Outcomes and Competences	It is provided students with improvement in capability of power system concept, faults in power systems and monitoring issues. Also students learn the protection methods in power systems.							
Textbook and /or References	<ul style="list-style-type: none"> •Protection of Industrial Power Systems: T. Dories, Pergamon Press, 1988. •Protective Relaying Principles and applications: J. L. Blackburn, Marcel Dekker, New York, 1988. 							
Assessment Criteria						If any, mark as (X)	Percent (%)	
	Midterms					x	50	
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final					x	50	
Instructors								
Week	Subjects							
1	Principles of protection							
2	Current and voltage transformers							
3	High current, differential and impedance protection systems							
4,5	Transformers, generators and line protection systems							
6,7	Operation and managing power systems							
8	Introduction to power system modeling, Midterm exam							

9	Computer based control of power systems
10	Necessity of data transmission in power systems,
11,12	Remote reading, operating, controlling, protecting and managing,
13	Remote reading, operating, controlling, protecting and managing,
14	Communication environment for power system applications.
15	Communication environment for power system applications.

EE-327 Generating Electrical Energy				Electrical and Electronics Engineering				
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project/Field Study	Other	Total	Credit	ECTS Credit
5	45				55	100	3	4
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	No							
Course Contents	Energy demands and sources; Power plants and their types; Water turbines, Generators for hydroelectric turbines Types of generators and their short circuit situations; Voltage regulations of generators; Structures of hydroelectric and thermal power plants and their electrical equipments; Maintenance of thermal power plants; Operation processes of power plants and load distribution; Gas turbines and power plants, and equipments; Fuels used in power plants and their environmental effects; Structures of nuclear power plants, Nuclear radiation and protection methods; Wastes and generating energy from wastes; Alternative energy systems; Environmental problems of power plants; Structure and place determination of power plants; Determination of power and number of units; Design and operation criteria according to day by day place curve and load curve; Set up and kWh costs; Electrical equipments of power plants; Generator operation; Reactive power compensation plants; Types and determination of types of transformer and switchgear stations.							
Course Objectives	Teaching the fundamental concepts and principles of electrical energy generation, types of power plants, electrical equipments of power plants and calculation of energy costs.							
Learning Outcomes and Competences	It is provided students with improvement in capability of electrical energy generation.							
Textbook and /or References	1-Powerplant Technology, M.M.El-Wakil, McGRAW-HILL. – 2-Power Plant Engineering, Lawrence F. Drbal, Kayla; Boston, Pat (Eds.) Hardcover 1996, ISBN: 978-0-412-06401-2 Springer.							
Assessment Criteria							If any, mark as (X)	Percent (%)
	Midterms						x	50
	Quizzes							
	Homework							
	Projects							
	Term works							
	Laboratory							
	Other							
	Final						x	50
Instructors								

Week	Subjects
1	Energy demands and sources
2	Power plants and their types
3	Water turbines, Generators for hydroelectric turbines Types of generators and their short circuit situations
4,5	Voltage regulations of generators; Structures of hydroelectric and thermal power plants and their electrical equipments; Maintenance of thermal power plants; Operation processes of power plants and load distribution
6,7	Gas turbines and power plants, and equipments; Fuels used in power plants and their environmental effects
8	Structures of nuclear power plants, Nuclear radiation and protection methods
9	Wastes and generating energy from wastes; Alternative energy systems; Environmental problems of power plants
10	Structure and place determination of power plants
11,12	Determination of power and number of units; Design and operation criteria according to day by day place curve and load curve
13	Set up and kWh costs
14	Electrical equipments of power plants; Generator operation
15	Reactive power compensation plants; Types and determination of types of transformer and switchgear stations.

EE-369 Computer Architecture					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45				55	100	3	4	5
Language	Turkish								
Compulsory / Elective	Selective								
Prerequisites	No								
Course Contents	Advanced processor structures: RISC architecture, pipeline structure, array processors, interleaved memory. Floating point computer arithmetic and algorithms. Input-output organization: data transfer methods, interrupts and direct memory access. Memory hierarchy, virtual memory, cache memory, memory management hardware. Multiprocessor architectures: interconnection structure, bus arbitrations, cache coherence..								
Course Objectives	The purpose of this course is to introduce the students to fundamental architecture of computers								
Learning Outcomes and Competences	<u>Students taking this course, basic computer architecture concepts of input and output of the memory knows. the concept of multi-processor architecture implements</u>								
Textbook and /or References	<ul style="list-style-type: none"> •Computer Architecture: A Minimalist Perspective, William F. Gilreath, Phillip A. Laplante, Kluwer Academic Publishers, 2003. •Computer Organization & Architecture, W. Stallings, Prentice Hall, 2003. •Bilgisayar Sistemleri Mimarisi, M. Morris Mano, Literatür Yayıncılık, 2002. •Bilgisayar Organizasyonu: RISC Donanımına Giriş, M. Bodur, Bileşim Yayınevi, 2003. •x86 Tabanlı Mikroişlemci Mimarisi ve Assembly Dili, N. Topaloğlu, Seçkin Yayıncılık, 2004. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	What is the processor? What is the computer architecture?								
2	RISC architecture								
3	Structure pipeling								

4, 5	Array processor
6, 7	associative memory
8	Floating point computer architecture and algorithm, Midterm
9	Input-output system: data transfer methods, interrupts, direct memory access, the channel concept.
10	Memory layouts: memory hierarchy
11, 12	image memory, cache memory, memory management hardware
13	Multi-processor architectures
14	Interval coupling structure, ways of arbitration
15	cell integrity

EE-469 Mobile Communication Systems					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4	7
Language	Turkish								
Compulsory / Elective	Selective								
Prerequisites	No								
Course Contents	Wireless communication systems, Introduction to mobile cellular communication and GSM systems, Wireless and cellular concept ,frequency concepts ,transmission problems, solution to transmission problems, GSM transmission process, channel assignment strategies, logical channels, bursts, mapping of logical channels onto physical channels								
Course Objectives	<u>The aim of this course, by learning in mobile communication systems and architectures and used technologies, the Standard applications and used in wireless and mobile networks is represent</u>								
Learning Outcomes and Competences	1) Learning of Wireless communication technologies 2) types of wireless and mobile networks and installations 3) used in wireless and mobile network standards and practices 4) modulation and coding techniques used in mobile communication system 5) 1G, 2G, 2.5G, 3G and 4G mobile communication systems								
Textbook and /or References	<ul style="list-style-type: none"> •Satellite Communication Engineering, New York, USA: Marcel Dek. Incorporated, 2002. •Mobile Communication Systems, Krzysztof Wesolowski, John Wiley&Sons, 2002. •Satellite Communications Systems, Techniques and Technology, John Wiley & Sons. Ltd., West Sussex, England, 2003. •Wireless Communications, Theodore S.Rappaport, Prentice Hall,1996 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Introduction to wireless communication systems,								
2	Cordless and Cellular Telephone Systems,								
3	Spektrum propagation								
4, 5	Error fixing								

6, 7	Error control process
8	Multiaccess process, Midterm
9	GSM technology
10	GSM subsystem and services
11, 12	HSCSD, GPRS, EDGE, DECT, TETRA
13	Wireless network
14	3G – UMTS / 4G
15	Satellite communication

EE-481 Data Structures					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
7	45				55	100	3	4	7
Language	Turkish								
Compulsory / Elective	Selective								
Prerequisites	No								
Course Contents	Introduction to data structures, Arrays and stacks, Recursion: recursive definition and processes, efficiency of recursion, Queues and lists: linked lists, other lists structures, Trees: binary trees, representing lists as binary trees, the Huffman algorithm, Hash tables, Sorting algorithms, Searching algorithms, graphs and applications, Storage management								
Course Objectives	The purpose of the course is to give students good programming skills through use of a high level language. Students learn how to cope with software problems using a high level programming language with data structures.								
Learning Outcomes and Competences	Students are equipped with tools like techniques for analysis and diagnosis of a problem, learning algorithmic methods, finding a solution to a problem using various techniques and programming tools, together with efficient programming techniques, documenting a software solution for future diagnosis and writing programs using data structures efficiently.								
Textbook and /or References	<ul style="list-style-type: none"> • Data Structures and Problem Solving Using Java, Third edition Mark Allen Weiss, Addison Wesley, 2006, ISBN: 0-312-31255-74 •Data Structures and Algorithms in Java, 4th edition Michael T. Goodrich, Roberto Tamassia, 2006, Wiley, 0-471-73884-0 •Object-Oriented Data Structures Using Java, 2nd edition Nell Dale, Daniel T. Joyce, Chip Weems, 2006, Jones and Bartlett, 0-763-737461 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	Introduction to data structures								
2	Arrays and stacks								

3	Recursion: recursive definition and processes,
4, 5	efficiency of recursion
6, 7	Queues and lists
8	linked lists, other lists structures
9	Trees: binary trees Midterm
10	representing lists as binary trees,
11, 12	the Huffman algorithm
13	Hash tables Sorting algorithms.
14	Searching algorithms graphs and applications
15	Storage management

EE-309 Technical Software Applications					Electrical and Electronics Engineering				
Semester	Teaching Methods							Credits	
	Lecture	Recite	Lab.		Homework	Other	Total	Credit	ECTS Credit
5	45				55	100	3	4	5
Language	Turkish								
Compulsory / Elective	Selective								
Prerequisites	No								
Course Contents	Problem solving with MATLAB, Arrays, M-files and functions, Input output functions and basic data structures, graph drawing, mathematics applications, Laplace and Fourier transformations, Simulink, Circuit analysis applications, SimPowerSystems block set, power systems applications, Control Systems Toolbox applications Other Toolbox and applications								
Course Objectives	By courtesy of this course, <u>Electrical and electronic engineering students to learn how to use Matlab is aimed</u>								
Learning Outcomes and Competences	Students taking this course, can do use in the electrical and electronic engineering analysis using Matlab, Toolbox and make image processing								
Textbook and /or References	<ul style="list-style-type: none"> •Her Yönü İle Matlab, Mehmet Uzunoğlu - Ömer Çağlar Onar, Türkmen Kitabevi, 2004. •A'dan Z'ye MATLAB ile ÇALIŞMAK, Doç. Dr. Doğan İbrahim, Bileşim Yayınları Teknik Kitaplar, 2004. 								
Assessment Criteria								If any, mark as (X)	Percent (%)
	Midterm Exams							X	50
	Quizzes								
	Homeworks								
	Projects								
	Term Paper								
	Laboratory Work								
	Other								
	Final Exam							X	50
Instructors									
Week	Subject								
1	What is Matlab								
2	Problem solving with MATLAB								
3	Arrays, Matrices								
4, 5	M-files and functions								
6, 7	Input output functions and basic data structures								

8	Graph drawing, Midterm
9	Mathematics applications, Laplace and Fourier transforms
10	Simulink
11, 12	Circuit analysis applications
13	SimPowersystems block set
14	Power systems applications
15	Control Systems Toolbox, applications, and other applications Toolbox