GAZİ UNIVERSITY
FACULTY OF TECHNOLOGY

COMPUTER ENGINEERING

ECTS SHEETS

GAZİ UNIVERSITY
FACULTY OF TECHNOLOGY
COMPUTER ENGINEERING UNDERGRADUATE POGRAM

1. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
FİZ-101	PHYSICS-I	3	1	4	3	5
KİM-101	GENERAL CHEMISTRY	3	1	4	3	4
MAT-101	MATHEMATICS-I	4	0	4	4	6
TÜR-101	TURKISH LANGUAGE-I	2	0	2	2	2
İNG-101	ENGLISH -I	3	0	3	3	3
TAR-101	ATATÜRK'S PRINCIPLES AND REVOLUTION HISTORY-I	2	0	2	2	2
BM-101	INTRODUCTION TO COMPUTER ENGINEERING	2	0	2	2	2
BM-103	ALGORITHMS AND PROGRAMMING	3	0	3	3	6
TOTAL		**22**	**2**	**24**	**22**	**30**

II. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
FİZ-102	PHYSICS-II	3	1	4	3	5
MAT-102	MATHEMATICS-II	4	0	4	4	6
MAT-104	LINEAR ALGEBRA	3	0	3	3	5
TAR-102	ATATÜRK'S PRINCIPLES AND REVOLUTION HISTORY-II	2	0	2	2	2
TÜR-102	TURKISH LANGUAGE-II	2	0	2	2	2
İNG-102	ENGLISH -II	3	0	3	3	3
BM-104	STRUCTURAL PROGRAMMING	3	1	4	3	4
BM-106	TECHNICAL DRAWING	2	1	3	2	3
TOTAL		**22**	**3**	**25**	**22**	**30**

III. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
EKO-201	ECONOMY	2	0	2	2	2
İNG-201	ENGLISH -III	3	0	3	3	3
MAT-201	DIFFERENTIAL EQUATIONS	4	0	4	4	5
MAT-205	DISCRETE MATHEMATICS	2	0	2	2	3
BM-205	CIRCUIT ANALYSIS	3	0	3	3	5
BM-207	CIRCUIT ANALYSIS LABORATORY	0	2	2	1	2
BM-209	DIGITAL DESIGN-I	2	0	2	2	3
BM-211	DIGITAL DESIGN LABORATORY-I	0	2	2	1	2
BM-215	OBJECT ORIENTED PROGRAMMING	3	2	5	4	5
TOTAL		**19**	**6**	**25**	**22**	**30**

IV. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
İNG-202	ENGLISH -IV	3	0	3	3	3
MAT-202	NUMERICAL ANALYSIS	3	0	3	3	4
İST-201	PROBABILITY AND STATISTICS	3	0	3	3	3
BM-206	ELECTRONIC CIRCUITS	3	0	3	3	5
BM-208	ELECTRONIC CIRCUITS LABORATORY	0	2	2	1	2
BM-212	VOCATIONAL SOFTWARE APPLICATIONS	2	2	4	3	5
BM-214	DIGITAL DESIGN-II	3	0	3	3	4
BM-216	DIGITAL DESIGN LABORATORY-II	0	2	2	1	2
SS-000	SOCIAL ELECTIVE COURSE-I	2	0	2	2	2
TOTAL		**19**	**6**	**25**	**22**	**30**

V. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
TİL-401	TECHNICAL COMMUNICATION	2	0	2	2	2
BM-301	MICROCOMPUTERS	3	2	5	4	7
BM-303	DATA STRUCTURES AND ALGORITHMS	3	2	5	4	6
BM-305	OPERATING SYSTEMS	3	2	5	4	6
BM-307	DATA COMMUNICATIONS	3	0	3	3	4
BM-309	FORMAL LANGUAGES AND AUTOMATA	3	0	3	3	3
SS-000	SOCIAL ELECTIVE COURSE-II	2	0	2	2	2
TOTAL		**19**	**6**	**25**	**22**	**30**

VI. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
BM-302	COMPUTER ARCHITECTURE AND ORGANIZATION	3	2	5	4	6
BM-304	DATABASE MANAGEMENT SYSTEMS	2	2	4	3	5
BM-306	ADVANCED PROGRAMMING	2	2	4	3	4
BM-308	COMPUTER NETWORKS AND DESIGN	2	2	4	4	5
BM-312	SOFTWARE ENGINEERING	2	0	2	2	3
BM-314	WEB DESIGN	2	2	4	3	3
BM-000	TECHNICAL ELECTIVE COURSE-I	3	2	5	4	5
TOTAL		**16**	**12**	**28**	**22**	**30**

VII. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
BM-401	WORKPLACE TRAINING	5	15	20	12	18
BM-403	STAJ	0				12
TOTAL		**5**	**15**	**20**	**12**	**30**

VIII. SEMESTER						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
KAL-402	QUALITY AND RELIABILITY	2	0	2	2	2
BM-402	WEB PROGRAMMING	2	2	4	3	4
BM-400	GRADUATION THESIS	0	2	2	1	6
BM-000	TECHNICAL ELECTIVE COURSE-II	3	2	5	3	6
BM-000	TECHNICAL ELECTIVE COURSE-II	3	2	5	3	6
BM-000	TECHNICAL ELECTIVE COURSE-II	3	2	5	3	6
	TOTAL	**13**	**10**	**23**	**15**	**30**
	7 QUARTER TOTAL	**130**	**45**	**174**	**147**	**210**
	TOTAL	**135**	**60**	**195**	**159**	**240**

Note: Students 4 After 72 working days during the summer semester of summer training (internship) will do.

FACULTY OF TECHNOLOGY
COMPUTER ENGINEERING ELECTIVE COURSES

IV. SEMESTER (SOCIAL ELECTIVE COURSES-I)						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
SS-201	INTRODUCTION TO BUSINESS SCIENCE	2	0	2	2	2
SS-203	BASIC LAW					
SS-205	INTRODUCTION TO MARKETING					
SS-207	BEHAVIORAL SCIENCES					
SS-209	CRITICAL THINKING AND PROBLEM SOLVING					

V. SEMESTER (SOCIAL ELECTIVE COURSES-II)						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
SS-301	INFORMATION LAW	2	0	2	2	2
SS-303	PUBLIC RELATIONS					
SS-305	HUMAN RESOURCE MANAGEMENT					
SS-307	PHILOSOPHY					

VI. SEMESTER (TECHNICAL ELECTIVE COURSES-I)						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
BM-352	INTEGRATED DIGITAL DESIGN LANGUAGE	3	2	5	4	5
BM-354	PROGRAMMABLE LOGIC CIRCUITS					
BM-356	INTRODUCTION TO ARTIFICIAL INTELLIGENCE					

BM-358	FUZZY LOGIC					
BM-362	MODELING AND SIMULATION					

VIII. SEMESTER (TECHNICAL ELECTIVE COURSES-II)						
CODE	**NAME**	**THEORY**	**APP./ LAB.**	**TOTAL**	**CREDIT**	**ECTS**
BM-410	INFORMATION SECURITY	3	2	5	4	6
BM-404	COMPILER DESIGN					
BM-406	SYSTEM PROGRAMMING					
BM-408	COMPUTER GRAPHICS					
BM-412	ALGORITHM DESIGN AND ANALYSIS					
BM-414	ELECTRONIC COMMERCE APPLICATIONS					
BM-416	INDUSTRIAL COMMUNICATION SYSTEMS					
BM-418	SIGNAL PROCESSING					
BM-422	CONTROL SYSTEM DESIGN					
BM-424	PROGRAMMABLE LOGIC CONTROLLERS					
BM-426	DIGITAL CONTROL SYSTEMS					
BM-428	ROBOTICS					
BM-432	PROCESS CONTROL					
BM-434	FILE ORGANIZATION					
BM-436	IMAGE PROCESSING					
BM-438	EMBEDDED SYSTEM DESIGN					
BM-442	MODEL-BASED SOFTWARE DEVELOPMENT					

Course Title-Course Code: BM-101 Introduction to Computer Engineering					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
I	30	0	0		45	75	2	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	None							
Course Contents	Introduction to Computer Engineering, Engineering and design concepts, Social, Ethical values and environment in Computer Engineering, Computing systems, Design and building block of computers, Operating Systems, Computer networks, Web technologies and internet, Programming languages and application programs, Data communications, database systems, Progresses in computer engineering,							
Course Objectives	This course will introduce beginning students to the field of engineering and what an engineer does. It will cover concepts of engineering design and the product development process, with the orientation toward computer engineering. Social, ethical, and environmental issues that an engineer must be sensitive to will be studied.							
Learning Outcomes and Competences	The student will have had opportunities to further his/her professional development through working in teams, practicing written, oral and graphical communication skills, using modern computer tools and acquire an appreciation to engage in college life and in life-long learning							
Textbook and /or References	Bilgisayar Mühendisligine Giris, Editor, Rifat Çölkesen, ,Papatya Yayıncılık, Elektrik ve Bilgisayar Mühendisliğine Giriş, Editor, C.B. Fiedderman, Translation: Erhan Akın, Nobel yayıncılık, 2003 Computer Science: An Overview, J. Glenn Brookshear, Addison Wesley; 2008							
Assessment Criteria							***If any,mark as (X)***	**Percent (%)**
	Midterm Exams						X	**20**
	Quizzes							
	Homework							
	Projects							
	Term Paper							
	Laboratory Work							
	Other						X	**20**
	Final Exam						X	**60**
Instructors								
Week	**Subject**							
1	Syllabus, Campus, faculty and department orientation Why computer engineering?.							
2	What kind of Engineers do employers want?							
3	Engineering and design concepts Computer Engineering concepts							

4	Social, Ethical values and environment in Computer Engineering
5	Computing systems, Design and building block of computers Operating Systems
6	Computer networks Multimedia Networks
7	Web technologies and internet
8	Programming languages Application programs
9	Midterm Exam
10	Data communications, database systems
11	Progresses in Artificial Intelligence
12	Computer and network Security
13	Software engineering
14	Computer engineering education
15	Progresses in computer engineering and Recommended skills for success

Course Title-Course Code: Algorithms and Programming – BM-103					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
I	45	0	0	75	30	150	3	6

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	Computer programming, the basic concepts. By analyzing problems step by step algorithm formal consolidation and development, creating a flowchart diagram. Related to structured programming concepts. Data types and variable definitions. Basic command structures. Terms and loop commands. Function concept. Single and multi-dimensional array of programming languages. Index operations. Indicators.
Course Objectives	Structured programming language to learn in an algorithmic
Learning Outcomes and Competences	Students taking this course; Can understand the basic algorithms, flow diagrams can be drawn and encode a problem.
Textbook and /or References	C Programlama Dili, Şerafettin Arıkan Seçkin Kitapevi Programlamayı C ile Öğreniyorum / Muhammet Yorulmaz Seher Yorulmaz, Palme Yayınevi Lecturer course documents

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work		
	Other	X	**10**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Computer programming, the basic concepts.
2	Algorithms
3	Flowchart Diagrams
4	Introduction to Programming, Data Types, Mathematical Expressions Logical Expressions
5	Statements Loops and Conditions
6	Functions
7	Arrays
8	Character Processing
9	Midterm Exam
10	Structures

11	Pointer (cursor, pointer)
12	Graphics
13	Text Files
14	Random Fies
15	Example Programs

Course Title-Course Code: Structural Programming, BM-104					**Name of the Program: Computer Engineering**			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
II	45	0	15	50	40	150	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites								
Course Contents	The overall structure of C++ program, variables, data types, constants, operators, control structures (if else, for, while, switch-case, do-while). Function definitions, function, use, present functions, use parameters, return type and use, arrays, strings, pointers, pointer arithmetic, function pointer, pointers, arrays, dynamic memory usage. Class definitions, class components, constructive and destructive, testimonials, member variables, member functions, copy constructors, "This" pointer, single and multiple inheritance. Function and operator overloading of the dominant functions. Identification of virtual functions, summarizing, templates, functions, hiding, friends, classes, exceptions,							
Course Objectives	To teach top-down design and implement a structured program							
Learning Outcomes and Competences	Students taking this course Statements distinguish structural and not structural concept of program The solution to a problem you know the steps. Makes a structural program design and codes.							
Textbook and /or References	Bora Güngören, C++ ile Nesne Tabanlı Programlama", Seçkin Yayıncılık Ankara Eckel, Bruce, Thinking in C++. Lecturer course documents							

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	The overall structure of C + + program
2	Variables, data types, constants, operators
3	Control structures (if else, for, while, switch-case, do-while).

4	Function definitions, function, use, present functions, use parameters, return type and use Arrays, strings
5	Pointers, pointer arithmetic, function pointer, pointers, arrays, dynamic memory usage.
6	Class definitions, class components
7	Constructive and destructive
8	Testimonials, member variables, member functions, copy constructors
9	Midterm Exam
10	This "marker, single and multiple inheritance
11	Function definitions, function, use, present functions, use parameters, return type and use
12	Identification of virtual functions
13	Function and operator overloading of the dominant functions
14	Summarizing, templates, function hiding, friends, classes, exceptions,
15	Sample Applications

Course Title-Course Code: Technical Drawing - BM-106					**Name of the Program: Computer Engineering**			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Homework**	**Other**	**Total**	**Credit**	**ECTS Credit**
II	30	0	15	-	55	100	2	3

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	-
Course Contents	Type of lines, technical writing and type of technical writing in technical drawing. Base geometrical drawing with computer; polygon drawing, ellipse, oval drawing. Perspective drawing with computer (Dimetric, Trimetric, İsometric perspective). Drawing the aspect of work pieces with computer. Scale, to scale. Aspect of cross section with computer. Symbols, package programs related to occupation and various occupations drawing use of package programs.
Course Objectives	Teaching technical drawing that common language of technical components.
Learning Outcomes and Competences	At the end of this course, students will be able to: - Make the conceptions and projects related to occupation.
Textbook and /or References	Benefit from lecture notes of instructor.

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	20
	Quizzes		
	Homeworks	X	10
	Projects		
	Term Paper		
	Laboratory Work		
	Other	X	10
	Final Exam	X	50

Instructors	
Week	**Subject**
1	Description and compulsory of technical drawing.
2	Use of lines of technical drawing.
3	Methods of technical writing.
4	Geometrics drawing.
5	Continue to Geometrics drawing.
6	Perspective.
7	Types of perspective and drawing of perspective,
8	Drawing the aspect of work pieces with computer.
9	Midterm
10	Works of scale drawing.

11	Aspect of cross section.
12	Drawing of symbols and notation use of electronics.
13	Continue to drawing symbols.
14	Drawing of electronics circuit scheme.
15	Conception of circuit project.

Course Title-Course Code: **CIRCUIT ANALYSIS, BM-205**							**Name of the Program: Computer Engineering**	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Hwk**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	45			35	45	125	2	3
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	MAT-102							
Course Contents	Basic circuit elements, electrical charge, electrical current, voltage, Ohm's Law, Kirchhoff's Laws, ideal and non ideal sources. Analysis techniques; node analysis, loop analysis, source exchange, superposition, Thevenin and Norton theorems, maximum power transfer method. AC steady state analysis; sinusoidal functions and their phasor representation. Phasor relationships of passive circuit elements. Node and loop analysis, source exchange, superposition, Thevenin and Norton theorems. Steady state power analysis; instantaneous and average power, effective values of periodic waveforms, complex power, power factor and power factor correction.							
Course Objectives	The objective of this course is to develop an understanding of fundamental concepts, rules and analysis methods used in circuit theory.							
Learning Outcomes and Competences	After successful completion of this course, the student will be able to; • Explain electrical charge, electrical current, voltage, electrical power, inductance, capacitance and Ohm's Law, Kirchhoff's Laws. • Make analysis of DC circuits using analysis techniques. • Determine phasor relationships of passive circuit elements. • Make steady state analysis of AC circuits using phasor methods. • Make steady state power analysis.							
Textbook and /or References	• Irwin, J. D. And Wu, C.H.,(1999)"Basic Engineering Circuit Analysis", Prentice Hall • Lecture notes							

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes	X	**5**
	Homeworks	X	**5**
	Projects		
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Weeks	**Subjects**
1	Unit systems, charge, current, voltage, power and basic circuit elements
2	Ohm's Law, Kirchhoff's Laws, ideal and non ideal sources
3	Analysis techniques; node analysis, loop analysis

4	Equality, linearity and superposition
5	Thevenin and Norton theorems, maximum power transfer method
6	Capasitance and inductance
7	AC steady state analysis; sinusoidal functions and their phasor representation. Phasor relationships of passive circuit elements
8	Impedance and admitance. Phasor diagrams
9	Midterm
10	Analysis techniques in AC; Node and loop analysis
11	Source exchange, superposition
12	Thevenin and Norton theorems
13	Steady state power analysis; instantaneous and average power
14	Effective values of periodic waveforms, complex power
15	Power factor and power factor correction

Course Title-Course Code: Circuit Analysis Laboratory-BM-207					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	0	0	30	20		50	1	2

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	Experiments related with the subjects of the circuit analysis course
Course Objectives	The objective of this course is to make experiments for understanding of fundamental concepts, rules and analysis methods used in circuit analysis courses
Learning Outcomes and Competences	At the end of this course, students will be able to: understand basic electrical measurement principles and measuring instruments, use basic electrical measuring instruments such as voltmeter, ampermeter, oscilloscope, etc. properly and efficiently, recognize basic electrical components, understand the analysis techniques, analyze the results, write a formal measurement or project report
Textbook and /or References	Course experimental sheets

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**30**
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	An overview of the laboratory experiments, Voltage and Current Measurement in DC Circuits
2	Close to Ideal Independent Voltage and Current Sources
3	Proof of Ohm's Law with Kirchhoff's Current and Voltage Laws
4	Nodal Analysis Method in DC Circuits
5	Loop Analysis and Superposition Methods in DC Circuits
6	Proof of Thevenin's Theorem in DC Circuits
7	Maximum Power Transfer in DC Circuits
8	Usage of Oscilloscope and Signal Generator
9	Midterm Exam
10	Determination of the Properties of Signal Generator with Investigating of Sinus Signal

11	Analysis of the Current and Voltage Relationship for a capacitor and an inductor in AC Circuits
12	Nodal Analysis Method in AC Circuits
13	Loop Analysis and Superposition Methods in AC Circuits
14	Proof of Thevenin's Theorem in AC Circuits
15	Maximum Power Transfer in AC Circuits

Course Title-Course Code: Digital Design-I , BM-209					Name of the Program: Computer Engineering		
Semester	**Teaching Methods**					**Credits**	
	Lecture	**Recite**	**Lab.**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	30		30	40	100	2	3
Language	TURKISH						
Compulsory / Elective	COMPULSORY						
Prerequisites							
Course Contents	The concepts of analog and digital, binary,octal,hexdecimal,number systems.The concepts of basic logic;AND,OR,NOT,Exculusive logic gates,structures of gates,digital integrated circuit, parameters,to classify,Boolean algebra, Demorgan rule, to obtain logic functions,definition,truth table,to obtain karnough diyagram,simplify minterm,maxterm forms and simplify,logic functions to implement with AND.NOT and OR,NOT gates encoders-decoders,code convertors, multiplexer,demultiplexer,comparators and arithmetic operations.						
Course Objectives	Learning and apply the combnational circuits.						
Learning Outcomes and Competences	Analog gravity can implement As a digital gravity; combinational circuits, Arithmetic circuits,encoder-decoder,multiplexer-demultiplexer etc						
Textbook and /or References	**Lesson notes of the teacher + laboratuar experinent notes.** **Floyd L.Thomas** (2006)'**Digital Fundamentals'** Prentice Hall **New York** **Sandige S. Richard**(1990)**'Modern Digital Desıgn'** McGRAWHILL **New York** **Almaini A.E.A**(1989)**'Elektronic logic System'**Prentice Hall **New York**						
Assessment Criteria					***If any,mark as (X)***	**Percent (%)**	
	Midterm Exams				X	**%20**	
	Quizzes				X	**%5**	
	Homeworks				X	**%5**	
	Projects				--	**--**	
	Term Paper				--	**--**	
	Laboratory Work				X	**%5**	
	Other				X	**%5**	
	Final Exam				X	**%60**	
Instructors							
Week	**Subject**						
1	The concept of Analog gravity-digital gravity						
2	Number systems and their conversion						
3	The concept of Basic and elements						
4	The Boolean algebra and applications by rules						
5	The Logic Functions and Definitions						
6	The Logic Functions applşcations by Truth table and development						
7	The standart form of the logic functions						

8	The logic functions to simplify and to apply by Boolean Algebra
9	Midterm
10	The logic Functions to simplify and to apply by Karnaugh-Maps
11	The logic functions same degenerate position and to obtain Nand/Nand;Nor/Nor;
12	The combinational circuits and Basic features
13	Arithmetic circuits.. Aditions,Subtraction, Multiply,Division, comploment Arithmetic
14	Encoder-Decoder….Parity circuits
15	Multiplexer-de multiplexer..comporators.

Course Title-Course Code: Digital Design Laboratory, BM-211					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	0	0	30		20	50	1	2

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	BM-209 to be followed or passed
Course Contents	A laboratory involving the design and implementation of logic circuits. Combinational design examples using small and medium scale integrated circuits.
Course Objectives	The laboratory will cover practical topics that extend concepts learned in class. Students will be able to implement and debug combinational circuits. They will also be able to write reports.
Learning Outcomes and Competences	be able to 1. Demonstrate basic laboratory skills, including the use of standard laboratory equipment. 2. Design and implement combinational logic using small-scale and medium-scale integrated circuits. 3. Test and debug the logic circuits.
Textbook and /or References	Laboratory handouts

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homework		
	Projects		
	Term Paper		
	Laboratory Work	X	**10**
	Other	X	**10**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Introduction to lab. equipment and forming the groups.
2	Familiarization to experimental sets
3	Exp.1 Theorems and Postulates of Boolean Algebra
4	Submission of the report of the previous experiment Exp. 2 Theorems and Postulates of Boolean Algebra
5	Submission of the report of the previous experiment Exp. 3 Binary numbers and arithmetic operations
6	Submission of the report of the previous experiment Exp. 4 Binary numbers and arithmetic operations
7	Submission of the report of the previous experiment

	Exp. 5 Logic circuit minimizations
8	Submission of the report of the previous experiment Exp. 6 Logic circuit manipulations
9	Midterm Exam
10	Submission of the report of the previous experiment Exp. 7 Combinational circuit applications
11	Submission of the report of the previous experiment Exp. 8 Combinational circuit applications
12	Submission of the report of the previous experiment Exp. 9 Combinational circuit applications
13	Submission of the report of the previous experiment Exp. 10 Combinational circuit applications
14	Submission of the report of the previous experiment Make up experiment
15	Review and Course Evaluation

Course Title-Code: BM-309 Formal Languages and Automata							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Prac.**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	45	0	0	45		90	3	3
Languages	Turkish							
Compulsory/ Elective	Compulsory							
Prerequisites								
Course Contents	Automata and formal languages categories. Finite State Machines: Mealy and Moore models. Regular languages and limitations. Tape automata. push-down automata and context-free grammers. Normal-form grammers. Turing machines, halting problem and unresolved. Recursive functions							
Course Objectives	To improve programming skills by achieving basic knowledge of classification and definition of languages and automata types and functions.							
Learning Outcomes and Competences	Students improve their language learning and design skills.							
Textbook and /or References	Özdevinirler (Otomatlar) Kuramı ve Biçimsel Diller, Ünal Yarımağan Formal Languages and Automata, Peter Linz, 2006							

Assessment Criteria		*If any,mark as (X)*	*Percent (%)*
	Midterm Exams	X	**30**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subjects**
1	Introduction to Automata
2	Finite Automata (FA) and Deterministic Finite Automata (DFA)
3	Non-deterministic Finite Automata (NFA)
4	Regular Expressions, DFA to accept regular expressions
5	Relation between Type 3 grammers and FA
6	Instantaneous Definitions, 2 Way Deterministic FA
7	Automata with output
8	Mealy and Moore Machines

9	Midterm
10	Properties of Regular Sets, Derivation Trees
11	Reduction and Normal Forms of Context Free Grammars
12	Pushdown Automata
13	Chomsky Hierarchy
14	Turing Machines
15	Turing Machines

Course Title-Course Code: Object Oriented Programming BM-215							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Project**	**Other**	**Total**	**Credit**	**ECTS Credit**
4	30	30		30	25	115	4	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	Overview of .NET, Introduction to Visual Studio.NET, Visual Studio.Net Programming Integrated Development Environment (Overview of .NET, Introduction to Visual Studio.NET,Introduction to C# Programming Language, Understanding Identifiers, Language Keywords, Using Variables, Basic Data Types,Basic Arithmetic Operators, Program Flow-Control Statements / Decision Control Operators, Iteration Statements, Exceptions, Working with Arrays, Enumerations and Structures, Methods and Scope,Introduction to Debugging, .NET Class Library – Assemblies and Namespaces, Working with Forms and Controls, Database Programming with ADO.NET (optional), Web Programming with ASP.NET (optional)
Course Objectives	The students who are the attituade this lesson; be able to begin writing and debugging C# programs in **.**net framework
Learning Outcomes and Competences	Students who attiduate this lesson; • Make basic application using the #C in the .NET platform • Be able to write basic console application. • Be able to create form applications • Use the XML • Be able to create web services, using with ASP.Net
Textbook and /or References	• Uysal, Mithat, Visual C#.Net ile Yazılım Geliştirme, Beta Basım Yayım Dağıtım, İstanbul • DUTHIE, G. Andrew, Adım Adım ASP.Net, Arkadaş Yayınları Ankara • Archer, Tom, C# Kavramak, Arkadaş Yayınları, Ankara • Sharp John, Jagger Jon, Adım Adım Visual C#.Net , Arkadaş Yayınları, Ankara

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20%**
	Quizzes		
	Homeworks		
	Projects	X	**10%**
	Term Paper		
	Laboratory Work		
	Other	X	**10%**
	Final Exam	X	**%60**
Instructors			
Week	**Subject**		

1	Overview of .NET, Introduction to Visual Studio.NET
2	Introduction to C# Programming Language
3	Understanding Identifiers
4	Language Keywords
5	Using Variables, Basic Data Types,Basic Arithmetic Operators
6	Program Flow-Control Statements / Decision Control Operators
7	Iteration Statements, Exceptions
8	Working with Arrays, Enumerations and Structures
9	Midterm Exam
10	Methods and Scope
11	Introduction to Debugging
12	.NET Class Library – Assemblies and Namespaces
13	Working with Forms and Controls
14	Database Programming with ADO.NET (optional)
15	Web Programming with ASP.NET (optional)

Course Title-Course Code: BM-314 Web Design							**Name of the Program: Computer Engineering**	
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
III	30	30		30		90	3	3
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	1. Internet, Intranet ,Internet services and protocols(FTP,e-mail,Telnet,www,SMTP,POP3,TCP/IP,http,etc.) concepts 2. Picture,graphic,animation,voice,view developing softwares 3. Hierarchic organization of web pages 4. Page format, page transition, target mass, content, property, color balance,placement, effection,document preparing,moving pictures and texts 5. Web Editor 6. Frames, schedules, lists, forms 7. Placement of visual subjects 8. Placement of script and applet,connections,text and line types,buttons and menus. Web host choosing; host name, property, capacity 9. İnternet service providers, databases and supporting of web programming, cost and limit of e-mail 10. File trasfer protocol (FTP) and its softwares 11. Connection of internet service provider,web page loading and updating							
Course Objectives	Able to personal and corporal web page design, acquire to applicating and publishing information							
Learning Outcomes and Competences	Students who attiduate this lesson; • Explains the internet and intranet concepts • Explains protocol types and concepts • Makes hierarchic organization of web page • Prepares static and effective documents • Knows file transfer protocols • Able to load and update prepared web pages							
Textbook and /or References	Erdem, O.A, Akcayol, M.A, (2005), "Web Teknolojileri", Seçkin Yayıncılık San., Ankara Ayhan Erdem Kişisel Web Sayfası, http://w3.gazi.edu.tr/~ayerdem/bilgisayar/webders/index.htm							
Assessment Criteria			*If any,mark as (X)*	Percent (%)				
	Midterm Exams		x	**%30**				
	Quizzes							
	Homeworks							
	Projects							
	Term Paper		x	**%10**				
	Laboratory Work							
	Other							
	Final Exam		x	**%60**				
Instructors								

Week	Subject
1	Internet, Intranet concepts
2	Internet services and protocols(FTP, e-mail,Telnet, www, SMTP, POP3, TCP/IP, http, etc.) concepts
3	Picture,graphic,animation,voice,view developing softwares
4	Hierarchic organization of web pages
5	Page format, page transition, target mass, content, property, color balance,placement, effection,document preparing,moving pictures and texts
6	Web Editor
7	Frames, schedules, lists, forms
8	Placement of visual subjects
9	Midterm
10	Placement of script and applet,connections,text and line types,buttons and menus. Web host choosing; host name, property, capacity
11	İnternet service providers, databases and supporting of web programming, cost and limit of e-mail
12	File trasfer protocol(FTP) and its softwares
13	Connection of internet service provider,web page loading and updating
14	Connection of internet service provider,web page loading and updating
15	Final Exam

Course Title-Course Code: Electronic Circuits, BM-206					Name of the Program: Computer Engineering		
Semester	**Teaching Methods**					**Credits**	
	Lecture	**Recite**	**Lab.**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	45		30		50	3	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	-
Course Contents	P and N type semiconductor materials. Semiconductor diodes; PN junction, the structure, operating principle, equivalent circuits, forward-bias and reverse-bias characteristics. Zener diode, LED diode, Schottky diode, varycap diode, tunnel diode. Half-wave and full-wave rectifiers, clampers, clippers, voltage multiplier circuits, applications of zener regulator. BJTs: PNP veNPN junctions, operating principle, amplifying action and configurations, operating chacaracteristics according to BJT configurations. JFET and MOSFET; the structure, operating principle, operating chacaracteristics and models. Diode, BJT, JFET and MOSFET; dc biasing, bias stabilty, comparing of bias circuits, operating point (quiescent point). Class A, B, AB, C ve D amplifiers, noise, gain and power calculating. Ideal operational amplifiers; the structure and operating principle, application cicuits (inverting and noninverting amplifiers, adder, subtractor, differentiator and integrator, linear op-amp circuits etc.). Experiments regarding these subjects.
Course Objectives	To understand basic operating principles regarding these course contents. To make the circuits design and applications.
Learning Outcomes and Competences	The structure of materials and basic operating principles are understood regarding diode, BJT, JFET, MOSFET and OP-AMP. The circuit design are made regarding these devices.
Textbook and /or References	1)BOYLESTAD Robert, NASHELSKY Louis, (1996) '' Electronic Devices And Cicuit Theory'', USA. 2)COUGHLIN Robert F., VILLANUCCI Robert S., '' Introductory Operational Aplifiers And Linear ICs - Theory and Experimentation'', (1990), USA. 3)GÜLER İnan., SAVAŞ Yılmaz, CANAL Rahmi, DEMİREL Hüseyin, CİYLAN Bünyamin, (2003) ''Electronics Devices ve Circuits Experimentations'', Ankara.

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks	X	**5**
	Projects		
	Term Paper		
	Laboratory Work	X	**10**
	Other	X	**5**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	P and N type semiconductor materials. Semiconductor diodes; PN junction, the structure, operating principle, equivalent circuits, forward-bias and reverse-bias characteristics.

2	Zener diode, LED diode, Schottky diode, varycap diode, tunnel diode.
3	Half-wave and full-wave rectifiers, clampers, clippers, voltage multiplier circuits, applications of zener regulator.
4	
5	BJTs: PNP veNPN junctions, operating principle, amplifying action and configurations, operating chacaracteristics according to BJT configurations.
6	
7	JFET and MOSFET; the structure, operating principle, operating chacaracteristics and models.
8	
9	Midterm
10	Diode, BJT, JFET and MOSFET; dc biasing, bias stabilty, comparing of bias circuits, operating point (quiescent point.
11	
12	Class A, B, AB, C ve D amplifiers, noise, gain and power calculating.
13	
14	Ideal operational amplifiers; the structure and operating principle, application cicuits (inverting and noninverting amplifiers, adder, subtractor, differentiator and integrator, linear op-amp circuits etc.). Experiments regarding these subjects.
15	

Course Title-Course Code: BM-208 Electronic Circuits Laboratory					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	0	0	30		20	50	1	2
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	-							
Course Contents	Applications related with BM 206 Electonics Circuits Course and reporting.							
Course Objectives	To be able do applications regarding circuits contents using circuits elements such as diode, transistors, operational amplifiers.							
Learning Outcomes and Competences	To be able to learn diode, transistors, operational amplifiers working principles. To be able to do applications by using these circuit elements and reports on each experiments.							
Textbook and /or References	1- PASTACI, H. Elektrik-Elektronik Deneyleri, Yıldız Teknik Üniversitesi Yayınları, 1992.							

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	x	**20**
	Quizzes		
	Homeworks	x	**10**
	Projects		
	Term Paper		
	Laboratory Work	x	**10**
	Other		
	Final Exam	x	**60**

Instructors	
Week	**Subject**
1	Diode
2	Transistors
3	Inverting, noninverting, buffer, adder circuits experiments
4	Subtractor, integrator and differentiator circuits experiments
5	Comparators, peak dedector, sensitive rectifiers, Schmitt-triggers circuits experiments
6	Nonlinear signal circuits experiments
7	Active filter types: Low-pass and high-pass filters circuits experiments
8	Bandpass and stopband filters circuits experiments.
9	Midterm Exam
10	Oscillator types: RC feedback oscillators; Wien-bridge, phase-shift, Twin-T circuits experiments
11	LC feedback oscillators; Hartley and Colpitts circuits experiments

12	Crystal controlled oscillators circuits experiments
13	Voltage controlled oscillators circuits experiments
14	Oscillators applications circuits experiments.
15	Evaluation of the term

Course Title- Course Code: Vocatioanal Software Applications, BM-212					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	30	0	30	40	25	125	3	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	-
Course Contents	Introductio to matlab, matlab product family, Introduction of the matlab menu, expressions and definitions used in programming, data structures, basic commands, array, vector and matrix operations, mathematical functions and applications, basic graphic drawings, m-file programming, user-defined functions, graphical user interface, application examples. Introduction to the packaced-software used to draw and simulate electronic circuits, Analog electronic devices, digital electronic devices, finding devices in the library and moving it into the work space, other operations to be done about it such as mirroring, rotating and delete of the circuit device. AC, DC, fourier, noise and transfer analysis of a drawed-circuit, measurement devices, test points, Creating a device which is not found in the library by using a similar device and new library. Separation of the design into modules, determination of input and output in each module, Establishment of connections between modules, Simulation studies fort he related circuit, Creating a footprints which is not found in the library by using a similar footprints and new library.
Course Objectives	Writing student's own computer programs effectively by using the matlab programming language for the numerical solution of simple engineering problems, producing the solution algorithms by using their basic information related to vocational courses and development of their skills and obtaining knowledge and skills regarded to be draw, simulate and create layout for the electronic circuits are the envisaged objectives of this course.
Learning Outcomes and Competences	Students taking this course ; 1) can comprehend basic principles in the use of Matlab. 2) can acquire basic principles of structured-programming. 3) can obtain the production skills to the solution algorithm for engineering applications. 4) can improve to be able to effectively use the Matlab programming language for the numerical solution of simple engineering problems and write your own custom computer programs ability. 5) can perform drawing each type of circuit related to analog and digital circuits by using the packaced-software. 6) can make continuous-time simulation of the circuit drawing on work space. 7) can make AC, DC, fourier, noise and transfer analysis of a drawed-circuit, 8) can create the netlis of a drown-circuit and draw its layout.
Textbook and /or References	-İbrahim D., Bilişim yayınları, (2004). "A'dan Z'ye Matlab ile Çalışmak" -İnan A., Papatya yayıncılık, (2004). "Matlab ve Programlama" -Şahin H., Atlaş yayıncılık, (2007). "Proteus: Isıs & Ares V.7" -Lecturer notes

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		

	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**
Instructors			
Week	**Subject**		
1	Introduction to matlab, matlab product family, Introduction of the Matlab menu.		
2	Expressions and definitions used in programming, data structures, basic commands.		
3	Array, vector and matrix operations.		
4	Mathematical functions and applications		
5	Basic graphic drawings		
6	M-file programming		
7	User-defined functions		
8	Graphical user interface		
9	Midterm Exam		
10	Introduction to the packaced-software used to draw and simulate electronic circuits		
11	Analog electronic devices, digital electronic devices, finding devices in the library and moving it into the work space, other operations to be done about it such as mirroring, rotating and delete of the circuit device.		
12	AC, DC, fourier, noise and transfer analysis of a drawed-circuit, measurement devices, test points		
13	Creating a device which is not found in the library by using a similar device and new library. Separation of the design into modules, determination of input and output in each module, Establishment of connections between modules, Simulation studies fort he related circuit.		
14	Netlist element footprints, hand-drawing, automatic placement and automatic drawing, determination of floor number of circuit, setting design criteria, control of physical connection criteria, industrial type converters.		
15	Creating a footprints which is not found in the library by using a similar footprints and new library.		

Course Title-Course Code: Digital Design II, BM-214					Name of the Program: Computer Engineering		
Semester	**Teaching Methods**					**Credits**	
	Lecture	**Recite**	**Lab.**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	45		30	50	125	3	4

Language	TURKİSH
Compulsory / Elective	COMPULSORY
Prerequisites	-
Course Contents	The concept of seguential logic,functions,definition and variety of the multivibrators; Monostable,bistable,astable multivibrators.The concepts of flip-flop.various RS;JK;T;D,master-slave RS flip-flop,synchronous and asynchronous seguel circuit design,counters,asynchronous counters,synchronous counters,ripple,ring,seguential counters,Up-Down counters,counter applications,registers,shift register applications.Seguential logic circuit state diagrams and state excitation.Memory components,memory organisation, memory code organisation,various memory,Programble Logic Arrays,PLA;PAL;GAL applications The design of ArithmeticLogic unit by seguential Logic Arrays.
Course Objectives	Learing basic Principles of the seguential circuits.
Learning Outcomes and Competences	Using of to gether circuits of combine and seguential is to design basic industry systems and their applications to implement.
Textbook and /or References	**Lesson notes of the teacher + laboratuar experiment notes.** **Floyd L.Thomas** (2006)'**Digital Fundamentals'** Prentice Hall **New York** **Sandige S. Richard**(1990)**'Modern Digital Desıgn'** McGRAWHILL **New York** **Almaini A.E.A**(1989)**'Elektronic logic System'**Prentice Hall **New York**

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**%20**
	Quizzes	X	**%5**
	Homeworks	X	**%5**
	Projects	--	**--**
	Term Paper	--	**--**
	Laboratory Work	X	**%5**
	Other	X	**%5**
	Final Exam	X	**%60**

Instructors	
Week	**Subject**
1	The concept of seguential logic, functions
2	Definition of and variety of the multivibratiors
3	Concept of Flip-flop and varions types of Flip-flop SR/FF
4	The design technics of sguential logic circuit
5	Synchronous and asynchronous circuits and design of them
6	Synchronous and asynchronous circuits and practice of them

7	Asynchronous and asynchronous circuits and practice of them
8	The special designed counters:Ripple,ring,Johnson Up/down etc.
9	Midterm
10	Registers, Shift Registers and applications of them.
11	Sguential Logic circuit state diagram and state
12	Memory components memory organization
13	Memory decoder circiuts
14	Memory decoder circiuts
15	**Final Exam**

Course Title-Course Code: Digital Design Laboratory, BM-216					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	0	0	30		20	50	1	2

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	BM-214 to be followed or passed
Course Contents	A laboratory involving the design and implementation of logic circuits. Combinational design examples using small and medium scale integrated circuits.
Course Objectives	The laboratory will cover practical topics that extend concepts learned in class. Students will be able to implement and debug both combinational and sequential circuits. They will also be able to write reports.
Learning Outcomes and Competences	be able to 1. Demonstrate basic laboratory skills, including the use of standard laboratory equipment. 2. Design and implement both combinational and sequential logic using small-scale and medium-scale integrated circuits. 3. Test and debug the logic circuits.
Textbook and /or References	Laboratory handouts

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homework		
	Projects		
	Term Paper		
	Laboratory Work	X	**10**
	Other	X	**10**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Introduction to lab. equipment and forming the groups.
2	Familiarization to experimental sets
3	Experiment 1: Latch and Flip-Flopss
4	Submission of the report of the previous experiment Experiment 2: Latch and Flip-Flops.
5	Submission of the report of the previous experiment Experiment3: Design of synchronous sequential circuits
6	Submission of the report of the previous experiment

	Experiment 4: Design of synchronous sequential circuits
7	Submission of the report of the previous experiment Experiment 5: Design of synchronous sequential circuits
8	Submission of the report of the previous experiment Experiment 6: Design of synchronous sequential circuits
9	Midterm Exam
10	Submission of the report of the previous experiment Experiment 7: Design of asynchronous sequential circuits
11	Submission of the report of the previous experiment Experiment 8: Design of asynchronous sequential circuits
12	Submission of the report of the previous experiment Experiment 9: Design of asynchronous sequential circuits
13	Submission of the report of the previous experiment Experiment 9: Design of Logic Circuits by Using the Programmable Logic Devices
14	Submission of the report of the previous experiment Make up experiment
15	Review and Course Evaluation

Course Title-Course Code: Microcomputers BM-301					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
V	45	-	30	80	20	175	4	7

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	-
Course Contents	Introduction to microprocessors, basics of microcomputer systems. 8-bit microprocessors and their structure. ALU, registers, control units. Data communication in computers, machine language, assembly language and its derivatives. Addressing methods. Opcode types and assembly language programming. I/O system control, programming practices and introduction to micro controllers. Experiments regarding these subjects
Course Objectives	Learning the basic elements of the microcomputer and programming these elements with low level languages
Learning Outcomes and Competences	Recognizing the basic elements of microcomputers, conceiving the importance of daily life and gaining of the programming skills on machine language to apply in industrial environments.
Textbook and /or References	TOPALOĞLU Nurettin, (2004), "Mikroişlemciler ve Assembly Dili", 4. edition, Seçkin Yayınevi, Ankara, ISBN : 975 347 707 4

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**5**
	Term Paper		
	Laboratory Work	X	**10**
	Other	X	**5**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Historical development of the computers
2	Architecture and organization of the computer, architecture of the CISC, RISC and EPIC
3	Basic knowledge of the computer architectures (Harvard and von Neuman)
4	Basic and advanced microprocessor features
5	From basic to complicate structure of the microprocessor (8-16-32-64 bit)
6	Structure of the memory, addressing of the memory, techniques of the address decoding
7	Internal structure of the microprocessor (registers, ALU and control unit)
8	Concept of the address and interrupts
9	Midterm

10	Assembly language, structure of the command, addressing modes
11	Transfer of the data and using of the stack, arithmetic and logic commands
12	Processing of the logic and control, programming, Time delay and programming
13	I/O communication systems and techniques, Interrupts service routines (ISR) and interrupt vectors,
14	Techniques of the serial and parallel interfacing and programming
15	Final Exam

Course Title-Course Code: Data Structures and Algorithms, BM-303	Name of the Program: Computer Engineering

Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
V	45		30	30	45	150	4	6

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	None
Course Contents	One-way and two-way linked lists, cyclic and mixed-linked lists, linked list, applications. Of operations on tree species and trees, binary trees, relations trees, tree-node operations. Stack design, the tail design. Sorting algorithms; intromission sequence, selective sorting, bubble, associative, clustering, and fast sorting, search algorithms, sequential and linear search, binary search trees, binary search over, hash algorithm, to resolve conflict. Graf definitions, graphs on the eclipse memory format.
Course Objectives	Learning data structures and alhoritms models and gaining the skill of the practice
Learning Outcomes and Competences	The students attend this course learn data structure and algorithms systems, and gain the skill of the practice.
Textbook and /or References	- Veri Yapıları ve Algoritmalar, Rifat Çölkesen, Papatya Yayımcılık, İstanbul - Lecturer Course notes

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**20**
	Quizzes	-	
	Homeworks	-	
	Projects	-	
	Term Paper	-	
	Laboratory Work	X	**10**
	Other	X	**10**
	Final Exam	X	**50**

Instructors	

Week	Subject
1	Principles of programming, dynamic and static programming.
2	Variable types, arrays, lists
3	A linked list and applications of linear and circular
4	Two linked lists and linear applications
5	Circular lists and applications of two connecting
6	Sparse matrices and represented as linked lists

7	Introduction to trees
8	Binary trees and recursive functions
9	Midterm Exam
10	Introduction of Graphs
11	Linked lists be represented by graphs
12	Sorting Algorithms
13	Sorting Algorithms
14	Searching Algorithms
15	Searching Algorithms

Course Title-Course Code: Operating Systems, BM-305	Name of the Program: Computer Engineering

Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
V	45		30	50		125	4	6

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	-
Course Contents	Program, Process, Thread, Deadlock, Process and Thread usage. Deadlock prevention and detection. Memory Management, swappin, paging, segmentation. File Orgnization. Single and multi user system. Distributed system. Client server models. Input/Output system.
Course Objectives	To learn about fundamental concepts, operation and organization of operating systems
Learning Outcomes and Competences	Student, 1. can describe basic process concept 2. will learn interprocess communication ans syncronization 3. will learn deadlock and deadlock prevention algorithms 4. will learn memory management principles 5. will learn input output principles
Textbook and /or References	1. Stallings, William, (2005). "Operating Systems: Internals and Design Principles", Prentice Hall. 2. Saatci, Ali, (1993), "Bilgisayar İşletim Sistemleri", Meteksen Yayınları, Ankara.

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Operating system overview
2	Basic concept and history
3	Process management
4	Process management algorithms
5	Threads
6	İnterprocess communication and synchronization
7	Deadlock and prevention

8	Memory management overview
9	Midterm
10	Memory segmentation and paging
11	Virtual memory
12	File systems
13	Input Output systems
14	İnterrupt mechanism
15	Direct memory access

Course Title-Course Code: Data Communication – BM-307							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
V	45	0	0	30	25	100	3	4

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	Requirements of computer networks, ISO reference model. TCP / IP, network types and topologies. Physical layer: Physical communication media, the weakening and degradation of the electrical im, Fourier series and the concept of modulation, frequency and time division multiplexing, modulation methods. Modem some connection standards, bit, time stamp and frame alignment. Data link layer: Idle RQ, RQ continuous algorithms, sliding window mechanism, HDLC and derivative protocols. Local networks, Ethernet and Token Ring. Wide area networks, PPP, ATM and Frame Relay, the services offered by telecommunications companies and standards.
Course Objectives	To learn concepts of computer networks
Learning Outcomes and Competences	Students who complete this course; can understand the concepts of logical physical network will make Local network design and implementation
Textbook and /or References	Computer Networks and Telecommunications, Gabriel Flood, 2009 Compass Publishing Bilgisayar Ağları ve Telekomünikasyon, Dr. Cebrail Taşkın, 2009 Pusula Yayıncılık TCP/IP İnternet'in Evrensel Dili, Murat Yıldırımoğlu, Pusula Yayıncılık Lecturer course documents

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**

Instructors	Course teaching staff
Week	**Subject**
1	Requirements of computer networks
2	OSI reference model
3	TCP / IP
4	Network types and topologies
5	Physical layer: Physical communication media, the weakening and degradation of the electrical im.
6	Fourier series and the concept of modulation, frequency and time division multiplexing, modulation

	methods.
7	Modem some connection standards, bit, time stamp and frame alignment.
8	Data link layer
9	Midterm Exam
10	Idle RQ, RQ continuous algorithms, sliding window mechanism
11	HDLC and derivative protocols
12	Local networks, Ethernet and Token Ring
13	Wide area networks
14	PPP, ATM and Frame Relay, the services offered by telecommunications companies and standards.
15	Local Area Network Design

Course Title-Course Code: **Computer Architecture and Organization, BM-302**					**Name of the Program: Computer Engineering**			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VI	45	-	-	30		75	4	6

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	EBE-357
Course Contents	Introduction to various digital components used in the organization and design of the computer. Design of the gate, register and level of the processor. Design of an elementary basic computer. Structure of the pipeline, executing superscalar and super pipelined processors, parallel executing and branch predicting. Arithmetical processes, design of the ALU, format of the instruction set, techniques of the coding and the decoding, methods of the memory addressing, Hardwired control and microprogramming control. Memory organization, cache memory, internal and external buses.
Course Objectives	To establish a solid background in the computer design and evaluation, To teach to how to design the assembly language instruction set for the computer, To teach the fundamentals of a computer datapath, memory, organization, controller and input-output structure such that the student can actually design these functional units.
Learning Outcomes and Competences	To ensure that the student have the necessary skills to organize, design, and implement at the gate and register level the four functional units (controller unit, datapath, memory and input-output unit) of a computer
Textbook and /or References	Mano, M., Morris, (1993), "Computer System Architecture", 3. ed., Prentice Hall International, ISBN 0-13-175738-5. TOPALOĞLU Nurettin, (2004), "x86 Tabanlı Mikroişlemci Mimarisi ve Assembly Dili", 2.edition, Seçkin Yayınevi, ISBN 975 347 805 4

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**30**
	Quizzes		
	Homeworks		
	Projects		
	Term Paper	X	**10**
	Laboratory Work		
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Digital components: multiplexer, de-multiplexer, shift registers
2	Microprocessor architecture, cache systems
3	Techniques of the pipeline, superscalar architecture and super-pipeline
4	Structure of the instruction, instruction set, methods of the coding and the decoding
5	Structure of the memory, memory map, memory addressing, techniques of address decoding

6	Parallel executing, branch prediction
7	Design of the controller unit of a basic computer, Register transfer language (RTL)
8	Microprogram based design approach for the controller
9	Midterm
10	Hardwired based design approach for the controller
11	Design of the controller unit by using RTL language
12	Assembly language and arithmetic processes
13	Data transfer, using the stack, arithmetic and logic processes
14	Organization of I/O and I/O techniques
15	Design of an elementary computer (Class work)

Course Title-Course Code: Database Management Systems, BM-304							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VI	30	0	30	65		125	3	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	None
Course Contents	Components of database systems, Data Base Management Systems, (DBMS) functions, architecture, data independency, data models, conceptual models, object oriented models and relational data model. Convertion of conceptual schemas to relational schemas, relational algebra and relational calculation, connections, key types, functional dependency, normal forms, multi-value dependency and database design. With SQL ; data description, relational questioning, data organization, using SQL with applications and update of designed database. Build up a process, charecteristics of productivity, detection of probabilities, reliability degrees, synchronicities, faults and their solutions, protection degrees, distributed data storage, distributed data process, distributed data model, simultaneous control, homogeneous ve heterogeneous solutions. File structures, index files, complex (hash) files, signature files, binary tree, multi-index files, variable compatible registered files.
Course Objectives	Learning database systems, models and SQL language and gaining the skill of the practice
Learning Outcomes and Competences	The students attend this course learn database systems, models and SQL language and gain the skill of the practice.
Textbook and /or References	- Silberschatz, A, (1997), Database System Concepts, McGraw-Hill - Yarımağan, Ü, (2000), Veritabanı Sistemleri, Akademi Kitabevi - Course notes

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**% 20**
	Quizzes		
	Homeworks		
	Projects	X	**%10**
	Term Paper		
	Laboratory Work	X	**%10**
	Other		
	Final Exam	X	**% 60**

Instructors	
Week	**Subject**
1	Components of database systems, Data Base Management Systems, (DBMS) functions, architecture
2	Data independency, data models, conceptual models
3	Object oriented models and relational data model.

4	Convertion of conceptual schemas to relational schemas, relational algebra and relational calculation
5	Connections, key types, functional dependency
6	Normal forms, multi-value dependency and database design.
7	Using SQL ; data description, relational questioning, data organization
8	Using SQL with applications and update of designed database
9	Midterm Exam
10	Build up a process, characteristics of productivity, detection of probabilities, reliability degrees, synchronicities using SQL
11	Faults and their solutions, protection degrees, distributed data storage, distributed data process, distributed data model
12	Simultaneous control, homogeneous and heterogeneous solutions.
13	File structures, index files, complex (hash) files, signature files
14	Binary tree, multi-index files, variable compatible registered files.
15	Applications

Course Title-Course Code: BM-306 Advanced Programming							Name of the Program: Computer Engineering	
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Projects	Other	Total	Credit	ECTS Credit
VI	30	0	30	40		100	3	4
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	None							
Course Contents	Advanced Object Oriented Programming, Multithreading, Streams and files, data base and networking applications, Java Beans, Collections, Internationalization, Servlets, JSP, EJB, and XML .							
Course Objectives	Aim of this cource is to teach the subjects such as advanced GUI components, server-client and web applications .							
Learning Outcomes and Competences	To be able to prepare Object Oriented Design and develop different programs by using java.							
Textbook and /or References	Core Java Volume II, Cay S. Horstman, Gary Cornell Prentice Hall							

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**%20**
	Quizzes		
	Homeworks		
	Projects	X	**%20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**%60**

Instructors	
Week	**Subject**
1	Fundamental Programming Structures in Java
2	2D and 3D Graphics Programming in Java
3	Advanced Graphics User Interface Compenents with awt and swing
4	Exceptions and Debugging
5	Streams and Files
6	Multithreading
7	Collections

8	Networking
9	MidTerm Exam
10	DataBase Connectivity:JDBC
11	Remote Objects
12	Java Beans
13	Security
14	Internatioanalization
15	XML

Course Title-Course Code: **Computer Networks and Design, BM-308**					**Name of the Program: Computer Engineering**			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Project**	**Other**	**Total**	**Credit**	**ECTS Credit**
VI	45	0	0	30		75	4	5
Language	Turkish							
Compulsory / Elective	Compulsory							
Prerequisites	No							
Course Contents	OSI reference model, layers standarts(I,V,X standarts) Serial communication, cable types, Synchronous and asynchronous communication, one, synchronization of character and frame Modem communication, connection oriented and connectionless methods Bus, token ring, star topologies Working principle of Ethernet frame structure CSMA\CD, working principle of ring Repeaters, bridges, switches, routers, Basic industrial network types Data traffic, technics of production Simulating, internal structures of bridges Routing technics (transparent, spanning tree etc.), multi route algorythyms TCP\IP layers Classification of IP addressing Masking, IP routing							
Course Objectives	To students; teaching used protocols with networks architectures and local and wide area networks, teaching tools of network hardware.							
Learning Outcomes and Competences	Students who attiduate this lesson; • Explains the basic network architecture and reference models • Cable which used setting up networks and electrical sign • Knows network topologies, used protocols and tools of network • Knows routing algorithyms • Knows internet protocols and addressing methods							
Textbook and /or References	Erdem, O.A, (1999), "Computer Telecommunication Technology", Gazi Press., Ankara/TÜRKİYE Stallings, W., (2003), "Network Security Essentials Applications and Standards", Prentice Hall, New Jersey, USA							
Assessment Criteria						***If any,mark as (X)***	**Percent (%)**	
	Midterm Exams					X	**%30**	
	Quizzes							
	Homeworks							
	Projects					X	**%10**	
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam					X	**%60**	
Instructors								

Week	Subject
1	OSI reference model, layers standarts (I,V,X standarts)
2	Serial communication, cable types,
3	Synchronous and asynchronous communication, one, synchronization of character and frame
4	Modem communication, connection oriented and connectionless methods
5	Bus, ring, star topologies
6	Working principle of Ethernet frame structure CSMA\CD, working principle of ring
7	Repeaters, bridges, switches, routers,
8	Basic industrial network types
9	Midterm
10	Data traffic, technics of production
11	Simulating, internal structures of bridges
12	Routing technics(transparent, spanning tree etc.), multi route algorythyms
13	TCP\IP layers
14	Classification of IP addressing
15	Masquareding, IP routing

Course Title-Code: BM-309 Formal Languages and Automata							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Prac.**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	30	0	0	45		75	2	3
Languages	Turkish							
Compulsory/ Elective	Compulsory							
Prerequisites								
Course Contents	Automata and formal languages categories. Finite State Machines: Mealy and Moore models. Regular languages and limitations. Tape automata. push-down automata and context-free grammers. Normal-form grammers. Turing machines, halting problem and unresolved. Recursive functions							
Course Objectives	To improve programming skills by achieving basic knowledge of classification and definition of languages and automata types and functions.							
Learning Outcomes and Competences	Students improve their language learning and design skills.							
Textbook and /or References	Özdevinirler (Otomatlar) Kuramı ve Biçimsel Diller, Ünal Yarımağan Formal Languages and Automata, Peter Linz, 2006							
Assessment Criteria						*If any,mark as (X)*		*Percent (%)*
	Midterm Exams					X		**30**
	Quizzes							
	Homeworks							
	Projects					X		**10**
	Term Paper							
	Laboratory Work							
	Other							
	Final Exam					X		**60**
Instructors								
Week	**Subjects**							
1	Introduction to Automata							
2	Finite Automata (FA) and Deterministic Finite Automata (DFA)							
3	Non-deterministic Finite Automata (NFA)							
4	Regular Expressions, DFA to accept regular expressions							
5	Relation between Type 3 grammers and FA							
6	Instantaneous Definitions, 2 Way Deterministic FA							
7	Automata with output							
8	Mealy and Moore Machines							

9	Midterm
10	Properties of Regular Sets, Derivation Trees
11	Reduction and Normal Forms of Context Free Grammars
12	Pushdown Automata
13	Chomsky Hierarchy
14	Turing Machines
15	Turing Machines

Course Title-Course Code:Software Engineering, BM-312					Name of the Program:Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**		**Other**	**Total**	**Credit**	**ECTS Credit**
VI	30			15	30	75	2	3

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	n/a
Course Contents	Client management relationship,software requirements, requirement determination, software and hardware requirements of the projects, modelling, prototype determination trial and optimizations, application of the standarts on the software developments. Project management, scheduling, task management, evaluation principles testing, risk analysis, software maintanence.
Course Objectives	Learning software development stages.
Learning Outcomes and Competences	At the end of this course, the student will be capable of using software developments techniques -listed above-and will be capable of applying them in their own programs.
Textbook and /or References	Sarıdoğan, M. E. Yazılım Mühendisliği, Papatya yayınları (2004).

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes	-	
	Homeworks	-	
	Projects	-	
	Term Paper	X	**10**
	Laboratory Work	-	
	Other	X	**10**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Computer Systems
2	Computer System engineering
3	Software engineering
4	Determination of software requirements
5	Software design
6	Software development
7	Testing the software
8	Software maintanence
9	Midterm
10	Software aspect reasurance

11	configuration methods
12	Software development methodology
13	Project management
14	Software development suggestions
15	Software development suggestions continued

Course Title-Course Code: Graduation Thesis , BM-400					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VII		30		120		150	1	6

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	
Course Objectives	
Learning Outcomes and Competences	
Textbook and /or References	Related books and periodicals

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	x	**40**
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	x	**60**

Instructors	
Week	**Subject**
1	
2	
3	
4	
5	
6	
7	
8	
9	Midterm Exam
10	
11	
12	

13	
14	
15	

Course Title-Course Code:Web Programming, BM-402							**Name of the Program: Computer Engineering**	
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
8	30	30		40		100	3	4

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	No
Course Contents	Interractive web pages, entering data/querying, chats, record of the etc. To setup of Web servers and programs need of programming software (IIS, Apache, etc). Forms and scripts connections, text box, control box, select box, buttons, and menus. Web Programming Languages, (php, asp, cgi, java, etc.) Structural differencies, comparision, passing, loops, arrays, variables, constants, and Java Applications (applets), Preparing of Database, querying database (SQL, MYSQL etc) and connections of the database (ODBC,JDBC etc). The managing of the Interractive web pages, Archieving of data, updating, creating of the database and publishing continuity.
Course Objectives	Able to personal and corporal interractive web pages design, acquire to applicating and publishing information
Learning Outcomes and Competences	Students who attiduate this lesson; • Explains the interractive web pages • Explains of the web programming languages • Makes hierarchic organization of web page • Prepares dynamic and effective documents • Knows queriying databases (SQL, MYSQL) • Able to load and update prepared interractive web pages
Textbook and /or References	Erdem, O.A, Akcayol, M.A, (2005), "Web Teknolojileri", Seçkin Publications Ltd., Ankara Ayhan Erdem's Home Pages, http://w3.gazi.edu.tr/~ayerdem/bilgisayar/webders/index.htm

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**%20**
	Quizzes		
	Homeworks		
	Projects	X	**%20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**%60**

Instructors	
Week	Subject
1	Rules of writing ASP and VBScript
2	Variables, Constants, Array functions, Operators

3	Program Control of VBScript, Logical tests, Loops
4	Standart functions, Alphanumerical arrays, Arrays, Test functions
5	Objects of ASP, The Methods,
6	ADO (ActiveX Database Object)
7	Transfer of the datas on HTML labels
8	PHP and Database
9	Midterm
10	PHP and Web Server
11	Data types, Variables..
12	Objects
13	Arithmetical and Logical Operators
14	Loops
15	Sample Programs

Course Title-Course Code: Critical Thinking and Problem Solving, SS-209					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
IV	30	0	0	10	10	50	2	2

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	None
Course Contents	The critical thinking, Logical fallacies, academic mission statement and plan of study, study skills and time management plan, problem solving, logical reasoning, deduction, induction, implication. Needs analysis, decision analysis, implementation and evaluation of solutions, team work, participation and leadership, conflict resolution. Dunker, fishbone models.
Course Objectives	To provide instruction and practice in the areas of critical thinking, problem solving, and use of research as a problem-solving tool. To assist students in identifying and articulating the skills necessary to be successful academically and professionally. Ethical and values considerations are included within the critical thinking and problem solving framework.
Learning Outcomes and Competences	Through this course, the student develops strategies to evaluate the sources and appropriateness of the information, develops creative alternative solutions, and chooses, implements, and evaluates alternatives. The inclusion of a collaborative report and presentation prepares students for work in teams.
Textbook and /or References	Eleştirel düşünme Kılavuzu-Kavramlar ve Araçlar, Dr. Richard Paul ve Dr. Linda Elder, Çev. Merih Bektaş Fidan, www.criticalthinking.org P.O.W.E.R Learning: Stratejies for Success in College and Life, Robert S. Feldman, http://www.mcgrawhill.ca/college/feldmanPower/

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams		**20**
	Quizzes		
	Homework		
	Projects		**20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam		**60**

Instructors	Aydın Çetin
Week	**Subject**
1	Syllabus, Introduction to Critical Thinking, Academic Mission Statement and Plan of Study, Study Skills & Time Management Plan
2	Library Resources and Research , internet sources , evaluation

3	Working groups and teams , Group dynamics , Group leadership and participation
4	Problem solving and conflict resolution
5	Research definitions, Discussion of case problem definition, causes, and possible solutions.
6	Decision analysis, Implementing solutions, Evaluating solutions
7	Logical reasoning for problem solving, logical fallacies
8	Financial Planning
9	Midterm Exam
10	Creating an implementation plan and brainstorm activities to complete implementation plan, assign responsibilities
11	creating oral presentations
12	creating written reports
13	Self evaluating communication skills
14	Academic Mission Statement and Plan of Study
15	Reflections on team process

Course Title-Course Code: Integrated Digital Design Language – BM352					**Name of the Program: Computer Engineering**			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
VI	45		30	50		125	4	5

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	-
Course Contents	Hardware definitions languages: VHDL, Verilog, JHDL, System C, the advantages of using high level language, design steps, development mediums, verifying tools, programming standards(JEDEC). Main data types, consecutive commands, composite data types, main modeling structures, sub procedures, pockets, using "use", component and configuration definition and usage, generate term, test Programs, testbench production. Expressing the system model design with VHDL language, compiling the Program code in development medium. Making restriction expressions, verifying the system with different simulation methods(functional etc.), generate the input variables with waveform generator. Testing Programs' s definition, usage, advantages.
Course Objectives	Design, simulation of advanced digital systems using hardware definition language and running on the FPGA. Rainforcement FPGA.
Learning Outcomes and Competences	
Textbook and /or References	1. Verilog HDL : a guide to digital design, Samir Palnitkar, 1996. 2. VHDL: analysis and modeling of digital systems, Zainalabidin Navabi, McGraw-Hill Publishing, 1998. 3. The Verilog® Hardware Description Language, Fifth Edition by D. E. Thomas 4. A VHDL Primer J. Bhasker Prentice Hall ISBN 0-13-181447-8

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	Subject
1	Introduction to hardware description languages
2	Programmable logical circuits (FPGA, CPLD)
3	Programmable logical circuits (FPGA, CPLD)
4	VHDL and basic digital design principles
5	VHDL and basic digital design principles

6	Behavioral and structural models
7	Behavioral and structural models
8	Syntax and basic rules
9	Midterm
10	Design simulation
11	Design simulation
12	Synthesis of VHDL
13	Synthesis of VHDL
14	Design mapping to standard cells and/or field programmable gate array (FPGA)
15	Design mapping to standard cells and/or field programmable gate array (FPGA)

Course Title-Course Code: BM-354 Programmable Logic Circuits					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
I	45	0	30		50	125	4	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	BM-209 , BM-211, BM-214, BM-216
Course Contents	Standard logic families, application specific integrated circuits, programmable logic circuits, In-system programmable integrated circuits, design and development methods, family selection criteria, logic cell arrays, programmable array logic circuits(PAL), FPGA structures and types, programming technologies (JEDEC etc.) , FPGA products and architectural differences, complex programmable logic circuit (CPLC) architecture, Ram and Rom based architecture. Logic equations, state machine inputs, circuit schematic, synthesis, making netlist. Simulation tools and their usage, simulation of the designed systems, error handling methods, hierarchical design, top-down and down-top design, design methods, programming languages and advanced technologies.
Course Objectives	It is aimed that to the students structures, components, types of programmable logic circuit and basic sufficiency of simulation Programs is achieved.
Learning Outcomes and Competences	Be able to use use a hardware description language and an appropriate professional level package for digital logic design, simulation, and implementation Be able to implement a relatively complex finite state machine design project in a Complex Programmable Logic Device utilizing the hardware description language
Textbook and /or References	Ekiz, H., 'Mantık Devreleri', ISBN:975-8289-13-6, Değişim Yayınları, 2004, Sakarya, Türkiye. FPGA-Based System Design (Prentice Hall Moden Semiconductor Design Series) by Wayne Wolf

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homework		
	Projects		
	Term Paper		
	Laboratory Work	X	**20**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Standard logic families, application specific integrated circuits, programmable logic circuits
2	In-system programmable integrated circuits, design and development methods, family selection criteria
3	Logic cell arrays, programmable array logic circuits(PAL),
4	FPGA structures and types

5	Programming technologies (JEDEC etc.) , FPGA products and architectural differences,
6	Complex programmable logic circuit (CPLC) architecture, Ram and Rom based architecture
7	Logic equations, state machine inputs,
8	Circuit schematic, synthesis, making netlist.
9	Midterm Exam
10	Simulation tools and their usage,
11	Simulation of the designed systems,
12	Error handling methods,
13	Design methods
14	Hierarchical design, top-down and down-top design
15	Pprogramming languages and advanced technologies

Course Title-Course Code: Introduction to Artificial Intelligence BM-356							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45	0	30	40	10	125	4	5

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	
Course Contents	Artificial intelligence concepts. Announced and unannounced searches; blind search, herustic search, game design. Information and inquiry, learning theory, learning types, artificial neural networks, information, expression patterns, semantic circuit, pattern matching, uncertainty, probability, planning, graphic plan, Markov decision process, natural language processing, image, image, and low-level classification. Advanced artificial intelligence applications; learning, image recognition, natural language concepts, uncertainty in case of query.
Course Objectives	To teach of Artificial intelligence and intelligent behavior, and the concepts of computer modeling
Learning Outcomes and Competences	Students taking this course; can distinguish between natural and artificial intelligence concepts can comprehend Intuitive logic problem-solving. can do modeling of information.
Textbook and /or References	Yapay Zeka, Problemler, yöntemler,algoritmalari Vasif V. NABİYEV, Seçkin Yayınevi Lecturer course documents

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**30**
	Quizzes		
	Homeworks	X	**5**
	Projects	X	**5**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Artificial intelligence concepts
2	Announced and unannounced searches; blind search, herustic search
3	Game design
4	Information and questioning
5	Learning theory
6	Learning Types
7	Neural Networks

8	Expression of information
9	Midterm Exam
10	Semantic circuit, pattern matching, uncertainty, probability, planning, graphical plan,
11	Markov decision process
12	Natural language processing, image and low-level classification
13	Advanced artificial intelligence applications
14	Learning, image recognition
15	The concept of natural language, the uncertainity event query

Course Title-Course Code: Fuzzy Logic BM-358					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
III	45		30	40	35	150	4	5

Language	Turkish
Compulsory / Elective	Compulsory
Prerequisites	
Course Contents	Historical Background/ Comparation of Fuzzy Logic with Modern Logic/ Fuzzy Sets/ Multivalued Logic/ Fuzzy Numbers/ Arithmetic Operations with Fuzzy Numbers/ Fuzzy Relations/ Reasoning in Fuzzy Logic, Fuzzy logic applications.
Course Objectives	To give the idea about Fuzzy Logic using mathematical background of Modern Logic and design of a fuzzy logic system.
Learning Outcomes and Competences	Knowledge of mathematical structure of Fuzzy Logic. To be able to develop membership function using various methods. To be able to design fuzzy logic system
Textbook and /or References	Lecture notes Elmas, C., (2007) Yapay Zeka Uygulamaları, Seçkin Yayınevi. Yan, J., Ryan, M., Power, J., (1994), Using Fuzzy Logic, Prentice Hall

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	x	**20**
	Quizzes		
	Homework		**10**
	Projects		
	Term Paper		
	Laboratory Work		**10**
	Other		
	Final Exam		**60**

Instructors	
Week	**Subject**
1	Artificial intelligence and artificial intelligence tools
2	Introduction to Fuzzy logic
3	Definition of fuzzy sets, Comparison of Fuzzy sets and Crisp Sets, Fuzzy set representations, Membership functions
4	Fuzzy sets operations; Crisp set operations, Basic fuzzy set operations,
5	Fuzzy Relations; Cartesian products, Fuzzy relations, Composition operators
6	Fuzzy Inference; two-valued logic, multi-valued logic, fuzzy logic, linguistic variables, fuzzy rules
7	Fuzzy inference, fuzzy reasoning, fuzzy logic control
8	Introduction to Fuzzy Logic Control System
9	Midterm
10	Fuzzy Logic Control System Configuration

11	Fuzzy Logic Controller Elements; Fuzzy Control Processes, Fuzzification, Knowledge Base,
12	Fuzzy Logic Controller Elements (continued) Inference Mechanism, Defuzzification
13	Obtaining methods of fuzzy rules
14	Design Procedures of Fuzzy Logic Controller
15	Fuzzy system design

Course Title-Course Code: **Modelling and Simulation, BM-362**							**Name of the Program: Computer Engineering**	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Project**	**Other**	**Total**	**Credit**	**ECTS Credit**
5	45		30	30	20	125	4	5
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	BM-205, MAT-201							
Course Contents	Control system terminology, feed back, open loop and closed loop control systems, transfer functions, block diagrams, signal flow graphs and Mason formula. Block diagram reduction with MATLAB. State space representation of the control systems. Identification of state variables and obtaining phase exchange block diagrams. Mathematical modelling of dynamics systems; basic system elements, modelling of electrical and mechanical systems. Analogies of electrical and mechanical systems. Modelling of electromechanical systems. Time domain response of first order and second order systems.							
Course Objectives	The aim of this course is to enable students to learn representation tools of dynamics systems, and to obtain time domain response of first and second order systems.							
Learning Outcomes and Competences	At the end of this course students will be able to; • Explain control systems terminology • Use representation tools of dynamics systems • Obtain models of electrical and mechanical elements • Obtain models of electrical and mechanical systems • Obtain time domain response of first order and second order systems • Make simulation of systems using MATLAB							
Textbook and /or References	Kuo, B. , Otomotik Kontrol Sistemleri, Literatür Yayınları Ogata, K., Modern Control Engineering, Prentice Hall Instructor's lecture notes							
Assessment Criteria							***If any,mark as (X)***	**Percent (%)**
	Midterm Exams						X	**20**
	Quizzes						X	
	Homeworks						X	
	Projects							
	Term Paper							
	Laboratory Work						X	**20**
	Other							
	Final Exam						X	**60**
Instructors								
Week	**Subject**							
1	Control system terminology, feed back, open loop and closed loop control systems							
2	Transfer functions, block diagrams and block diagram reduction							
3	Block diagram reduction with MATLAB							
4	Signal flow graphs							

5	Obtaining transfer function using Mason formula
6	State space representation of the control systems
7	Identification of state variables and obtaining phase exchange block diagrams
8	Identification of state variables and obtaining phase exchange block diagrams(contunie)
9	Midterm
10	Mathematical modelling of dynamics systems; basic system elements.
11	Modelling of electrical systems
12	Modelling of mechanical translational systems and mechanical rotational systems
13	Analogies of electrical and mechanical systems. Modelling of electromechanical systems
14	Time domain response of first order systems
15	Time domain response of second order systems

Course Title-Code: BM-404 Compiler Design					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Prac.**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	3		2	3	2		4	6

Languages	Turkish
Compulsory/ Elective	Elective
Prerequisites	BM-213
Course Contents	Compiler, compiler types, compile, semantic analysis, (lexical analysis) and relation characteristics. The concept of Finite Automata, Non-deterministic finite automata, (NFA), NFAs to DFAs (Deterministic finite automata), minimisation and optimization algorithms, finite automata constructions**,** traditional sets and expressions, automata equivalents, context-free grammers and syntax analysis, regular grammers, left and right linear grammers. Top-down parsing, bottom-up parsing, LR parsing, syntax-oriented definitions and loops, various programming languages structures**,** series notation and subroutine calls. Symbol tables management, linear lists, search trees, complex tables, memory management, debugging, error recovery, code optimization, loop optimization, code management, machine model and peephole optimization.
Course Objectives	Students is to teach basic concepts and principles related to the compiler with encountered in compiler design and construction issues for the algorithm
Learning Outcomes and Competences	Students will learn the basic concepts of compiler design
Textbook and /or References	Özdevinirler (Otomatlar) Kuramı ve Biçimsel Diller, Ünal Yarımağan Modern Compiler Design, D. Grune

Assessment Criteria		*If any,mark as (X)*	*Percent (%)*
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**5**
	Other	X	**5**
	Final Exam	X	**60**

Instructors	
Week	**Subjects**
1	Introduction to Compiler, Compiler modules

2	Syntactical definitions of programming languages
3	Lexical Analysis
4	Finite State Machines
5	Lexical analyzer design
6	Syntax Analysis (parsing treesı)
7	Parsing methods: bottom-up and top-down parsing
8	Type checking, Preparation of the symbol table
9	Midterm
10	Intermediate code generation
11	Code Optimization (by machine)
12	Code Optimization (by Programrs)
13	Compiler's analysis-synthesis phase
14	Assembler and Compilers
15	Error analysis

Course Title-Course Code: System Programming, BM-406					**Name of the Program: Computer Engineering**			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
VIII	45		30	50	25	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	Being a programming course in winning the base
Course Contents	Win32 file system, file creation, reading, writing, code conversion, file/directory properties and Windows registry 2. Heap, heap memory management, file sort, Dynamic Link Library (DLLs). 3. Process management, creating process, defining process, process exiting and ending, console control events, process time. 4. Threads, thread essentials, thread management, using library in threads, thread synchronization. 5. Sockets, server client socket functions, receiving message, multiple connections. 6. Structure of RPC, definitions of interface, RPC client/server.
Course Objectives	The objective of this course; using the kernel functions of the operating system, file, memory, and network programming to earn the basic capabilities.
Learning Outcomes and Competences	At the end of this lesson, Student; Can explain Win32 file and folder system Can explain memory management Can explain the process management Can describe Thread usage and schedule Network programming with Sockets Remote subprogram calls (RPC), communication object module (COM) can make use of.
Textbook and /or References	1. A. Silberscatz, P.B. Galvin, "Operating System Concepts", Addison Wesley. 2. W. Stallings, "Operating systems: Internals and Design Principles", Prentice Hall. 3. http://webcast.berkeley.edu/courses ,Operating Systems and System Programming

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**5**
	Other		**5**
	Final Exam	X	**60**

Instructors	
Week	Subject
1	Win32 file system, file naming, file open, read, write, close,
2	Code transformations, file/folder attributes and Windows registry
3	Heaps, heap memory management,
4	Sort files, memory map files and dynamic link libraries (DLL)

5	Process management, process creation, process definitions, process exit and termination
6	In the console control events and process times
7	Threads and scheduling, thread basics, thread management
8	Thread within the library usage, thread models, thread priorities and thread synchronization.
9	Midterm
10	Sockets, socket server functions
11	One-to-one messaging Client functions, and set up multiple connections, the server program
12	Remote subprogram calls, structure
13	Interface definitions
14	The RPC client/server COM and DCOM.
15	The RPC client/server COM and DCOM

Course Title-Course Code: BM-410 Information Security					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	45	30	150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites								
Course Contents	Knowledge and information assets, history of information security, information and computer systems security, security elements and management, information system attacks and types, malicious software, types, classification and current malware, spyware, the emergence and spread spyware, antispyware measures can be taken, to prevent keyboard listening and listening systems, personal privacy and information crimes.							
Course Objectives	Learn information and computer security subjects and redound accumulation of information. Educate students that produce theoretical and pratical solutions to problems.							
Learning Outcomes and Competences	The student that takes this course: 1. Learn information and computer security technics. 2. E-signature and verification of identity methods. 3. Formation computer security models. 4. Design information and computer security research projects							
Textbook and /or References	• "Bilişim Korsanlığı ve Korunma Yöntemleri", D. Yılmaz, Hayat Yayınları, 2004. • "Cryptography And Network Security Principles And Practices" Stallings Will, Prentice Hall, 2003. • "Security Engineering", R. Anderson, Willey, New York, 2001. • Computer Security Fundamentals (Prentice Hall Security Series) by Chuck Easttom							
Assessment Criteria					***If any,mark as (X)***		**Percent (%)**	
	Midterm Exams				X		**20**	
	Quizzes							
	Homeworks				X		**10**	
	Projects							
	Term Paper							
	Laboratory Work				X		**10**	
	Other							
	Final Exam				X		**60**	
Instructors								
Week	**Subject**							
1	Knowledge and information assets							
2	History of information security							
3	Computer systems security							
4	Security elements and management,							
5	Information system attacks and types							
6	Malicious software, types							
7	The emergence and spread of spyware spyware software							

8	Classification and current malware
9	Midterm Exam
10	Antispyware measures can be taken
11	To prevent keyboard listening
12	Personal privacy
13	Information crimes
14	Firewall
15	Information security standart

Course Title-Course Code: Algorithm Design and Analysis, BM-412					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	Recite		**Lecture**	**Recite**		**Lecture**	**Recite**
VIII	45		30	75		150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	None							
Course Contents	Algorithm design and analysis techniques. Time and computational complexities of algorithms. Selected computer algorithms such as sorting, searching, string processing, heuristic and graph algorithms. Introduction to NP-completeness, parallelisation of algorithms, linear and dynamic programming.							
Course Objectives	The objective of this course is to teach how complex algorithms can be developed using higher level techniques to solve problems in the most efficient way.							
Learning Outcomes and Competences	To be able to design and analysis algorithm and determine the best and the worst cases of algorithms							
Textbook and /or References	Teoriden Uygulamalara Algoritmalar, Prof.Dr. Vasif Nabiyev, Seçkin Yayıncılık Introduction to Algorithms, 2nd ed.: *T.H.Cormen, C.E. Leiserson, R.L. Rivest, C. Stein, MIT Press, 2001*							

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**
Instructors			

Week	**Subject**
1	Algorithm design and analysis techniques. Time and computational complexities of algorithms.
2	Cluster Theory and Algorithms
3	Number Theory and Algorithms
4	Graph Theory Algorithm
5	Sorting Algorithms
6	Labyrinths Algorithms

7	Geometric Algorithms
8	Packing Problems
9	MidTerm Exam
10	Gap interrogation and Trees
11	Fraction Problems
12	Combinatory Algorithms
13	Cryptography Algorithms
14	Optimization Algorithms
15	Games and Games Search Algorithms

Course Title-Course Code: Electronic Commerce Applications, BM-414					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45	0	30	50	25	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	
Course Contents	Internet, electronic shopping, virtual commerce, business management, online services, trade policies, electronic payment systems, consumer rights, advertising. The advantages of electronic commerce, traditional trade comparison, current developments in electronic commerce applications. Web infrastructure (hardware, software) to create the customer interface, data base operations, association, querying the registry to add, delete, refresh, install, update, publish. Virtual trade risk in the use, protection of consumer rights. Password methods (verification, validation, creation, password
Course Objectives	To learn E-Commerce concepts and information about security procedures
Learning Outcomes and Competences	Students taking this course; Can comprehend E-Commerce before you need to know the basic concepts of time Will make an E-Commerce applications
Textbook and /or References	E-Ticaretin Temelleri, Dilek Olcay Elektronik Ticarette Tüketicinin Korunması ve Bir Uygulama, Selda ENE Lecturer course notes

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Internet, electronic shopping, virtual trade concepts
2	Business management, online (online) services,
3	Trade policies, electronic payment systems, consumer rights, advertising.
4	The advantages of electronic commerce, traditional trade comparison, current developments in electronic commerce applications
5	Web infrastructure (hardware, software) to create the customer interface
6	Data base operations,
7	Association, inquiry process

8	Record insertion, deletion, replacement, installation, update operations
9	Midterm Exam
10	Publishing process
11	Virtual trade risk in the use,
12	Protection of consumer rights
13	Password methods (verification, validation, creation, password security),
14	Appropriate encryption secure interface design
15	Security software usage.

Course Title-Course Code: Industrial Communication System, BM-416					**Name of the Program: Computer Engineering**			
Semester	Teaching Methods						Credits	
	Lecture	Recite	Lab.	Project	Other	Total	Credit	ECTS Credit
VIII	45		30	50	25	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	-
Course Contents	Network architecture, star, ring, bus cable type, Electronic devices related to connection type, Network Access methods (Profibus, S-bus, intrbus, I2C, CAN) peripheral structure, Synchronization types, comparision of Industrial network cccess methods, Electronic device parts and network protocols registers. High level protocols. Comparision of Device net CANOPEN, Cankingdom, OSI model. Industrial bridge and its working principles, protocol conversion. Industrial network simulation, Network traffic production, Network analysis, making bridge.
Course Objectives	To learn about communication methods and devices used in industrial systems
Learning Outcomes and Competences	Student, • can describe network structure. • will learn network acces methods and synchronization type. • will learn industrial bridge and its working principles. • will learn network traffic and making analysis of netwok traffic.
Textbook and /or References	• Frank J., Derfler Jr., Sistem yayıncılık, " Network Sistemleri ve Bilgisayar Bağlantı klavuzu" • 2. İnternet resources related with subject.

Assessment Criteria		*If any,mark as (X)*	Percent (%)
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	Subject
1	Network architecture
2	Star, ring, bus cable type, Electronic devices related to connection type,
3	Electrical signals and its properties.
4	Network Access methods (Profibus, S-bus, intrbus, I2C, CAN) peripheral structure
5	Synchronization types, comparision of Industrial network cccess methods

6	Electronic device parts and network protocols registers.
7	High level protocols.
8	Comparision of Device net CANOPEN, Cankingdom, OSI model.
9	Midterm
10	Industrial bridge and its working principles
11	Protocol conversion.
12	Industrial network simulation
13	Network traffic production
14	Network analysis, making bridge.
15	Applications

Course Title-Course Code: Signal Processing, BM-418							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Project**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	30		30	60	30	100	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	-To learn the necessary tools for analysing digital signals. To learn how to design a digital signal processing system for a given problem considering the trade offs in the system design process.							
Course Contents	Continious and discrete time systems and signals. Linear Time invariant systems stability and causality, Sampling and quantization schemes, Computation of DFT, FFT techniques. digital filter design techniques, FIR and IIR filters. Z transform and its application							
Course Objectives	To learn the necessary tools and methods for analysing digital signals.							
Learning Outcomes and Competences	Student, can express discrete signal using unit and impulse function can do convolution can solve difference equation using Z transform can compute Fourier Tansform and do harmonic analysing con use matlab tools for related application							
Textbook and /or References								

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**5**
	Term Paper		
	Laboratory Work	X	**10**
	Other	X	**5**
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Introduction to Digital Signal Processing
2	Classification of signals, basic signal and its properties
3	Discrete Time Signals and Systems
4	Convolution and its properties
5	Systems described by difference equation
6	Z Transform and its properties
7	Solving difference equation using Z transform

8	Frequency Analysis of Signals and Systems
9	Midterm
10	Discrete Fourier Transform
11	Fast Fourier Transform
12	FIR Filters
13	IIR Filter
14	IIR Filter
15	Final Exam

Course Title-Course Code: Control Systems Design, BM-422					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	45	30	150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites								
Course Contents								
Course Objectives	This course is intended to give learners an insight into the time and frequency domain response of the control systems and what methods and controllers can be used to design the systems that meet indented performances. A great deal of this course involves mathematical analysis and theory, but practical situations will be examined using computer simulation tools							
Learning Outcomes and Competences	Determine control system time and frequency domain responses for the inputs. 2-Use Bode,Nyquist diagrams to satisfy the reqirements. Examine the controllers. Apply Root-Locus diagrams to design control systems.parameters. Examine the controllers							
Textbook and /or References								

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**40**
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Time domain response of the control systems
2	Time domain response of the control systems
3	Frequency domain response of the control systems
4	Frequency domain response of the control systems
5	Bode diagrams
6	Nyquist diagrams
7	Design the systems

8	Design the systems
9	Midterm Exam
10	Root-Locus diagrams
11	Root-Locus diagrams
12	mathematical analysis
13	computer simulation tools
14	computer simulation tools
15	Final Exam

Course Title-Course Code: Programmable Logic Controllers, BM-424					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	40	35	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	
Course Contents	Basics of control systems, peripherals, contactors, relays, timers, standards related to control circuits. Programmable Logic controller (PLC), Arhictecture, Central processing unit, Input Output Unit, Memory organization, PLC operating system and running user programs. Programming languages: statement lists, ladder diagrams. Basic command list, timers, counters, mathematical and comparison instructions. PLC-PE and PLC connections, communication interface, protocols, logic circuit design methods, program control commands, Master control operations and controls. Selection methods of a PLC and Industrial Applications
Course Objectives	Understing the Basics of Control systems, architecture of programmable logic controller, Input Output units, operating system, Programming methods, Physical connections, communication interface, designing an Industrial application
Learning Outcomes and Competences	After successful completion of this course, the student will be able to; 1. Define the elements used in Control systems. 2. Define the structure, input-output units, and operating systems of the programmable logic controllers. 3. Use ladder diagram and instruction set to program the PLC. 4. perform the physical connection of PLCs. 5. Perform industrial applications using PLCs
Textbook and /or References	Tahsin Yazır, "PLC Otomasyon Sistemleri", Furkan Ofset Bursa 2) Saadettin Aksoy, "Programlanabilir Lojik Denetleyiciler ve Mühendislik Uygulamaları", Değişim yayınları,İstanbul 3) Salman Kurtulan, "PLC ile Endüstriyel Otomasyon", Birsen Yayınevi

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	x	**20**
	Quizzes		
	Homeworks		
	Projects		
	Term Paper		
	Laboratory Work	x	**20**
	Other		
	Final Exam	x	**60**

Instructors	
Week	**Subject**
1	Basics of control systems
2	Contactors, relays, timers, standards related to control circuits

3	Programmable Logic controller (PLC),
4	Arhictecture, Central processing unit, Input Output Unit, Memory organization
5	PLC operating system and running user programs
6	Programming languages: statement lists, ladder diagrams
7	Basic command list, timers, counters
8	mathematical and comparison instructions
9	Midterm Exam
10	PLC-PE and PLC connections
11	Communication interface, protocols
12	Logic circuit design methods, program control commands
13	Master control operations and controls
14	Selection methods of a PLC and Industrial Applications
15	Final Exam

Course Title-Course Code: Digital Control Systems BM-426					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	50	25	150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	-							
Course Contents	Introduction to digital control systems. Digital control system definitions and applications Difference equations. z-transformation and inverse z-transformation. Sampling. Open- loop and closed-loop discrete-time systems. State equations of discrete-time systems. State diagrams of discrete-time systems. Discrete-time system responses in time domain. Stability analysis of discrete-time systems. Digital controller design. Modeling discrete-time systems using matlab. Simulation studies of discrete-time systems.							
Course Objectives	The aim of this course is give the basic information about the digital control system, introduce the basic z-transformations and system model in the time domain and various discrete-time controller design, and teach system analysis and simulations using the designed controller.							
Learning Outcomes and Competences	Students taking this course ; 1) can define application areas of open-loop and closed-loop digital control systems by their basic concepts and definitions 2) can obtain the discrete-time mathematical model of systems. 3) can realize the analysis of discrete-time systems. 4) can determine the performance criteria of system. 5) can explain the design techniques of the controller which determine the behavior of system to meet the defined design objectives. 6) can perform the digital simulations to test the performance of the system.							
Textbook and /or References	-Kuo, Benjamin C., Saunders College Publishing, 2nd edition., "Digital Control Systems". -Sarıoğlu,K., İstanbul 1998. "Dijital Kontrol Sistemleri" -Isermann R., Springer-Verlag, (1988). "Digital control systems". -lecturer notes.							
Assessment Criteria						*If any,mark as (X)*	**Percent (%)**	
	Midterm Exams					X	**25**	
	Quizzes					X	**5**	
	Homeworks							
	Projects					X	**5**	
	Term Paper							
	Laboratory Work					X	**5**	
	Other							
	Final Exam					X	**60**	
Instructors								
Week	**Subject**							
1	Introduction to digital control systems							

2	Digital control system definitions and applications
3	Difference equations
4	z-transformation and inverse z-transformation
5	Sampling
6	Open- loop and closed-loop discrete-time systems
7	State equations of discrete-time systems
8	State diagrams of discrete-time systems
9	Midterm Exam
10	Discrete-time system responses in time domain
11	Stability analysis of discrete-time systems.
12	Stability analysis of discrete-time systems.
13	Digital controller design
14	Modeling discrete-time systems using matlab
15	Simulation studies of discrete-time systems

Course Title-Course Code: Robotics-BM-428					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	45	30	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	MAT-203, BM-211, BM-214
Course Contents	Basic components used in robotic systems; mobilization of freedom degrees and structural features, extreme elements, drives and drive systems, the sensor types used in the robot. Kinematics for animating; limit the selection of the coordinate, direct, inverse kinematics, Jacobean matrix, the solution of equations of kinematics. Main body and the joint combination of speed, force and moment are;. Differential movement, speed, relationships, the definition of a stir forces and moment. Dynamic modeling; Lagrange's energy for rousing expression, Lagrange equations of motion, the rousing of the numerical simulation model. Trajectory planning; joint trajectory, the Cartesian way. Stir control; traditional system design, the traditional controller design, force-moment control.
Course Objectives	Purpose of this course is to give detail knowledge the graduate student about special defining, back and forth kinematics and robot control
Learning Outcomes and Competences	Students attended this lectures; Can make robot simulation. Can control robotic systems with using different control methods. Will learn robot programming languages
Textbook and /or References	Text book; Küçük, S., Bingül Z., Robot Tekniği-I, 2005, Birsen Yayınevi. Craig, J. J.,. Introduction to Robotics: Mechanics and Control., 1989, USA. Schilling, R., Fundamentals of Robotics Analysis and Control, 1990, Prentice Hall, NewJersey Niku, S. Introduction to Robotics: Analysis, Systems, Applications, Prentice Hall, 2001

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**10**
	Term Paper		
	Laboratory Work	X	**10**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subject**
1	Building of robot and working principles
2	The using purpose of robots and block diagrams
3	Robotic modeling
4	Sensor used in robots
5	Arm shaped robots

6	Control system of robot
7	Control system of robot
8	Control system of robot
9	Midterm exam
10	Wheeled robots
11	Models of pos/configuration kinematics and dynamic
12	Robot programming
13	Robot programming
14	Project applications
15	Project applications

Course Title-Course Code: Process control, BM-432					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45	0	30	50		150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites	-							
Course Contents	Introduction to process control. Basic concepts and definitions. Modeling Process systems. Controllers of process control and setting techniques. Characteristics of processes, tuning and performance criteria. Control strategies; distributed control, feed forward, cascade and proportional control. Destroying characteristic of the control loops for the disturbance signals. Power interface connections with operational amplifiers, thyristor, MOSFET. General applications; temperature-pressure control application, viscosity-level control application.							
Course Objectives	It introduce students to basic elements of process control systems, show different process control structures and be to allow analysis of processes by modeling these processes.							
Learning Outcomes and Competences	Students taking this course ; 1) can realize the importance of process control. 2) can take the necessary knowledge and skills related to modeling processes. 3) can understand and comprehend strategies used in control of processes. 4) can take information and skills about process control applications.							
Textbook and /or References	-Smith A.C. and Corripio B.A. Jhon Wiley & Sons. "Principles and Practice of Automatic Process Control" -Seborg D.E. and Edgar T.F., D.A. Mellicamp, Jhon Wiley & Sons. "Process Dynamics and Control' -lecturer notes							
Assessment Criteria						***If any,mark as (X)***		**Percent (%)**
	Midterm Exams					X		**20**
	Quizzes							
	Homeworks							
	Projects					X		**10**
	Term Paper							
	Laboratory Work					X		**10**
	Other							
	Final Exam					X		**60**
Instructors								
Week	**Subject**							
1	Introduction to process control.							
2	Basic concepts and definitions.							
3	Modeling process systems							
4	Modeling Process systems							
5	Controllers using to control process systems and setting techniques.							

6	Process characteristics, tuning and performance criterias.
7	Control strategies; distributed control, feed forward, cascade and proportional control.
8	Control strategies; distributed control, feed forward, cascade and proportional control.
9	Midterm Exam
10	Destroying characteristic of the control loops for the disturbance signals.
11	Power interface connections with operational amplifiers, thyristor, MOSFET.
12	Power interface connections with operational amplifiers, thyristor, MOSFET.
13	General applications
14	Temperature-pressure the control application
15	Viscosity-level the control application

Course Title-Course Code: File Organization, BM-434					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	75	0	50	15	10	150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	BM-101
Course Contents	Basic File Organization Concepts, Sequential File Cencepts, Sorting, Indexed Sequential File Organization, Relative File Organization, Access Methods, Physical and Logical Characteristics of files, Basic Database Operations
Course Objectives	The basic concepts of computer science and engineering, one of the structures of the files examined in detail several examples of this basic information, provide reinforcing.
Learning Outcomes and Competences	Students taking this course will learn the basic concepts of file organization.
Textbook and /or References	**Textbooks** Alan L. Tharp, File Organization and Processing, Wiley, 1988. **Assistant Textbooks** Raghu Ramakrishnan, Johannes Gehrke, Database Management Systems 3rd Edition, McGraw Hill International Editions, 2003.

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	x	**20**
	Quizzes		
	Homeworks	x	**10**
	Projects	x	**10**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	x	**60**

Instructors	
Week	**Subject**
1	Basic File Organization Concepts
2	Basic File Organization Concepts
3	Sequential File Cencepts
4	Sorting
5	Indexed Sequential File Organization
6	Indexed Sequential File Organization

7	Relative File Organization
8	Relative File Organization
9	Midterm Exam
10	Access Methods
11	Physical and Logical Characteristics of files
12	Physical and Logical Characteristics of files
13	Basic Database Operations
14	Basic Database Operations
15	Basic Database Operations

Course Title-Code: Image Processing, BM-436	Name of the Program: Computer Engineering

Semester	Teaching Methods						Credits	
	Lecture	Prac.	Lab.	Projects	Other	Total	Credit	ECTS Credit
VIII	3		2	5			4	6

Languages	Turkish
Compulsory/ Elective	Elective
Prerequisites	
Course Contents	Basis of the image, The properties of light, color information, human visual system, cameras, computer vision systems, black-white images, color image, color models (RGB, CMY, TIQ), digital image. Sampling of the image signal. Image formats, image enhancement techniques; point processing methods, black-white images, slicing of gray tone values, brightnees adjusment, contrast enhancement and computer applications. Image filtering systems. Two-dimensional image transformations; two-dimensional Fourier transform and implementation of fast Fourier transformation images. Image data coding techniques, image compression and techniques.
Course Objectives	image processing in Frequency and Spatial domens, optimization, compression methods and feature extraction methods for basic shape recognition to teach.
Learning Outcomes and Competences	Image processing methods and algorithms to improve their level of practice to learn
Textbook and /or References	Görüntü İşleme Teknikleri ve Mühendislik Uygulamaları, A. Muhittin Albora, Onur Osman, Osman N. Uçan, Nobel yayın dağıtım, 2007 Digital Image Processing, 2nd Edition,,Rafael C. Gonzalez, Richard E. Woods, Addison Wesley

Assessment Criteria		*If any,mark as (X)*	*Percent (%)*
	Midterm Exams	X	**30**
	Quizzes		
	Homeworks		
	Projects	X	**5**
	Term Paper		
	Laboratory Work	X	**5**
	Other		
	Final Exam	X	**60**

Instructors	
Week	**Subjects**
1	Basic information for Image Processing
2	Image enhancement methods and Image Restoration
3	Image processing Statistical Methods

4	Segmentation and Frame Setting
5	Mathematical Morphology
6	Transformation of 2D and 3D
7	Finding basic shape features
8	Image Processing in Frequency domain
9	Midterm
10	Image Transform Methods
11	Moving Image Processing
12	Color Image Processing
13	Image Compression Algorithms
14	Image processing methods and feature extraction
15	Shape Recognition

Course Title-Course Code: Embedded System Design, BM-438					Name of the Program: Computer Engineering			
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45		30	45	30	150	4	6
Language	Turkish							
Compulsory / Elective	Elective							
Prerequisites								
Course Contents	The course provides advanced knowledge in the design of complex computer systems, in particular embedded systems. Models and methods are discussed that are fundamental for systems that consist of software and hardware components. Embedded Systems Overview, Embedded System Components, Electronic Design Aid Tools, Printed Circuit Board Design Techniques, Summary and Future Vision							
Course Objectives	The properties of the integrals,componets and circuits of embedded systems; the basic tools and methods used in the programming of embedded systems.							
Learning Outcomes and Competences	Student will understand the issues that will be faced during embedded system development including software achitectures for embedded systems, real-time operating systems, embedded system development tools, hardware systems.							
Textbook and /or References	• Burns, Alan and Wellings, Andy. *Real-Time Systems and Programming Languages.*3rd Ed. *Ada 95, Real-Time Java and Real-Time POSIX.* • *Designing Embedded Hardware , John Catsulis* • UML-B Specification for Proven Embedded Systems Design by Jean Mermet							
Assessment Criteria					***If any,mark as (X)***		**Percent (%)**	
	Midterm Exams				X		**20**	
	Quizzes							
	Homeworks				X		**5**	
	Projects				X		**10**	
	Term Paper							
	Laboratory Work				X		**5**	
	Other							
	Final Exam				X		**60**	
Instructors								
Week	**Subject**							
1	First Look at Embedded SYstems							
2	Hardware Systems I							
3	Hardware Systems I							
4	C-language for Embedded Systems							
5	Interrupts							
6	Software Architectures							
7	Real-time OS I							
8	Real-time OS II							
9	Midterm Exam							

10	Other system services like events, message queues, etc.
11	Design of Real-time OS
12	Development Tools I
13	Development Tools II
14	Application I
15	Application II

Course Title-Course Code: Model-Based Software Development, BM-442							Name of the Program: Computer Engineering	
Semester	**Teaching Methods**						**Credits**	
	Lecture	**Recite**	**Lab.**	**Projects**	**Other**	**Total**	**Credit**	**ECTS Credit**
VIII	45	0	30	75		150	4	6

Language	Turkish
Compulsory / Elective	Elective
Prerequisites	None
Course Contents	Object Oriented concepts, Object Oriented Modelling with UML, , Object Oriented requirement Analysis, Object Oriented Design, Object Oriented softwaretest, UML Oriented Software Devlopment Environment, Software Development process, Code Engineering and software certification .
Course Objectives	
Learning Outcomes and Competences	
Textbook and /or References	"Object-Oriented Software Engineering Using UML, Patterns", Bernd Bruegge, Allen H. Dutoit, Pearson Prentice Hall. "Tasarım Şablonları ve Yazılım Mimarileri", Özcan Acar, Pusula Yayıncılık "UML ile Nesne Tabanlı Çözümleme ", Bora Güngören Seçkin Yayıncılık

Assessment Criteria		***If any,mark as (X)***	**Percent (%)**
	Midterm Exams	X	**20**
	Quizzes		
	Homeworks		
	Projects	X	**20**
	Term Paper		
	Laboratory Work		
	Other		
	Final Exam	X	**60**
Instructors			

Week	**Subject**
1	Object Oriented Software Development Process
2	Sofware Development Modelling
3	Software Analysis
4	Class level design
5	Architecture level Design
6	Architectural models and UML
7	Design Patterns
8	Creative patterns
9	MidTerm Exam

10	Structual patterns
11	Behavioral patterns
12	JEE Design Patterns
13	Software architecture and Design Patterns
14	3-Layered architecture, Design architecture with Spring
15	Final Exam