

**T.C.**  
**Marmara University**  
**Technology Faculty**  
**Mechatronics Engineering Department**

Total | T = 118 | P = 92 | Total Hours = 210 | Credits = 164 | ECTS = 240

**1. SEMESTER**

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>BLM110</b>	<b>Using Fundamentals of Information Technologies</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	This lesson introduces students to a well-rounded approach to computer literacy that includes basic computer concepts, software applications keyboarding/word processing review, spreadsheets and presentation .	1	2	2	Compulsory	3
<b>FZK171</b>	<b>Physics I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Physics, pure sciences, experiments and measurement concept, Motion in One Dimension, Vectors and Motion in Two Dimension, Circular Motion, Motion Laws and Other Applications of Newton's Laws and friction, Review , exercises and problem solving approaches, Work, Kinetic energy and Power , Potential Energy and conservation of Energy, Linear Momentum and Collisions, Rotation of a Rigid Object and Angular Momentum, Universal Gravitation, Static Equilibrium and Elasticity, Fluid Mechanics, General Review and problem solving	3	0	3	Compulsory	5
<b>MAM120</b>	<b>Technical Drawing</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Technical Drawing, Technical Drawing Tools, Drawing papers, Scales, Letters and Numerals, Line , Geometric Drafting (Circle and Arcs), Projection ( Points, Lines, plane), Views, Sections, Dimensioning, Perspective	2	2	3	Compulsory	4
<b>MAT185</b>	<b>Calculus I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Function, Trigometric, logarithm and exponential function, inverse function Hyperbolic function. Limit definition, one sided limit, Limit properties, continuity, infinite limits, derivatives definition, derivative of function, implicit differentiation, application of derivatives, chain rule, common graphs, introduction to integration.	4	0	4	Compulsory	6
<b>MAT187</b>	<b>Linear Algebra</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Linear equation systems, Matrices, Vector Spaces, Linear Transformations, Determinants, Eigen vectors and eigen values, Orthogonal, Gram-Schmidt orthogonalization	3	0	3	Compulsory	5
<b>TF150</b>	<b>Work Health and Safety</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	The difference between hazards and risks, Common hazards, Improving health and safety performance, Environmental protection	2	0	2	Compulsory	3
<b>TRD121</b>	<b>Turkish Language I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Definition and characteristics of language; the place of Turkish among other worldly languages; historical development, correct usage, structure and grammar rules of Turkish language. Definition of language. Language, thinking and emotion relationships. Language-culture relationship: What is culture? Components and its specifications which constitute the culture. Changes in the culture. Language and society relationship. Languages of the World. The place of the Turkish language among World languages. Development of the Turkish language and its historical periods. Turkish dialects and accents. Verbal language and written language. The present situation of Turkish language its scope. An applied study on a text of any Turkish dialect or a comparative work on the texts of dialects. Spelling rules. Punctuation marks. Derivatives. Discussion and evaluation of examination papers. Discussion on a random issue. The ways to determine the verbal equivalents of concepts (derivation, combination etc.). Verbal and written expression. Qualities of a good expression. Observation, thinking, reading, good usage of parent language. Speech deficiencies. Stress in Turkish: stress on words, stress on groups, stress on sentences. Conversation, public speaking, meetings. Written expressions: Sentence, paragraph. Types of narration: to narrate, explanation, description, etc. Incoherent expressions (Mistakes in Turkish language exam and composition papers and other incoherent expression examples which were determined on television, journals and in the Media. Phrasal expressions: Proverbs and idioms (Form and concept specifications). Interlinguistic exchange: Historical relationships of Turkish language, the channel of the exchange among languages, types of adaptations.	2	0	2	Compulsory	2

<b>YDZA121</b>	<b>German I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Perfekt:trennbare Verben,untrennbare Verben,Verben auf -ieren,Wetter-und Reiseberichte, Zimmerreservierung,Personenbeschreibungen,Dativ, Possessivartikel,mit+Dativ, Unterrichtsprojekte planen, an,auf,in+Akkusativ oder Dativ,Orientierung in der Stadt,welch-, Übungen- Wiederholung, argumentieren und vergleichen,Stadt-und Landleben,Verkehrsmittel,Komparativ und Superlativ, Nationalitäten und Sprachen,Zeitungsnachrichten, aus,bei,von,zu +Dativ,Personalpronomen:Dativ, Präteritum:Modalverben können,müssen,wollen,dürfen.Satzklammer:Modalverben, Nebensätze: dass,weil ,über Häuser und Wohnungen sprechen,Wohnungsanzeigen, Dativ-Objekt,Verben mit Dativ/mit Dat.und Akk.,eine Umfrage im Kurs,Anzeigen lesen und schreiben	2	0	2	One Foreign Language	2
<b>YDZF121</b>	<b>French I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Alphabet et phonétique - les articles, Les adjectifs: être, avoir - le corps, Les démonstratifs - le jour, le mois, l'année, Les verbes en IR - les saisons, Les mesures, l'âge, Les trois groupes de indicatif - La famille Vincent, Le passé composé de indicatif - La Mme Vincent, Le passé composé avec être - le salon, la cuisine, Le futur de l'indicatif, le futur proche recuit, Le verbe pronominal - La toilette de Vincent, Le passé composé d'un verbe pronominal, Le pluriel des noms, Le superlatif - L'amie à Paris	2	0	2	One Foreign Language	2
<b>YDZI121</b>	<b>English I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Verb to be, possessive adjectives, questions and negatives, present simple social expressions informal letter, there is , there are , how many , how much , this , that, directions, prepositions of place , some,any,these,those,linking words, can, can't,could, couldn't, formal letter, past simple regular verbs, irregular verbs, silent letters, special occasions take part in the content of subject.	2	0	2	One Foreign Language	2

## 2. SEMESTER

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>BLM120</b>	<b>Computer Programming</b>	T	P	C	<b>Compulsory</b>	
	Program development , codification, compiling, error handling,objects, Sub program structures, arrays, one dimensional and multidimensional arrays, inheritance, text and binary files, GUIs	2	2	3	Compulsory	4
<b>FZK172</b>	<b>Physics II</b>	T	P	C	<b>Compulsory</b>	
	1-Electrical charge and Coulomb's law 2-Electrical fields 3-Gauss's law 4-Electric potential 5-Capacitors and Dielectrics 6-Current, resistance and electromotive force 7-Simple direct currnt circuits and application of Ohm's anf Kirchoff's laws 8-Magnetic field and magnetic forces 9-Soueces of Magnetic fields 10-Electromagnetic induction and Faraday's law 11-Inductance 12-Magnetic properition of matter 13-Alternating current 14-Simple alternating current circuits	3	0	3	Compulsory	4
<b>KMY120</b>	<b>Chemistry</b>	T	P	C	<b>Compulsory</b>	
	Subject of chemistry, Nomenclature, Atom and its structure, Periodic table, Mol and Chemical Problems, Chemical Bonds, Gases, Liquids, Solids, Mixtures, Acids, Bases, Chemical Kinetic and Equilibrium, Thermodynamic.	2	0	2	Compulsory	4
<b>MAM104</b>	<b>Mechanics I</b>	T	P	C	<b>Compulsory</b>	
	Vectors and forces. Resultants of force systems.Frames and cables.Friction.Centroids and centers of gravity.Moments of inertia. Method of virtual work. Kinematics of particles. Kinematics of rigid bodies. Work and energy. Impuls and momentum.	2	0	2	Compulsory	4
<b>MAT186</b>	<b>Calculus II</b>	T	P	C	<b>Compulsory</b>	
	Indefinite integrals, computing indefinite integral, substitution rule for indefinite integral, average value function, area between curves, arc length of function valume revolution( method of ring and method of cyclinder) , generalized integration, series and sequences, vector calculation vector arithmetic, multiple integration, double integration, triplen integration.	4	0	4	Compulsory	5
<b>MRM100</b>	<b>Introduction to Mechatronics Engineering</b>	T	P	C	<b>Compulsory</b>	
	What is mechatronics? Technologies forming mechatronics and application areas. What are the basic features of Mechatronics systems? Sensors, types application places, selection criterias. Automation, automation types and automation pyramid. Flexible Manufacturing Syaytems (FMS). Industrial Robots, configurations, main parts. Presentation of Robot programming software COSIMIR Educational. Move Master and Melfa Basic IV programming examples. Introduction to PLC, main parts and introduction to PLC programming. Pressure, position and time dependant control applications by using PLC. Sqential circuits control with PLC. PLC controlled project applications. PLC controlled project presentation. PLC controlled system applications on MPS unit.	2	0	2	Compulsory	2
<b>MRM102</b>	<b>Measurement Technique</b>	T	P	C	<b>Compulsory</b>	
	Basic concepts of measurement systems and engineering experiments, Measurement errors, SI unit system, basic measurement tools such as rulers and high gages, work with venire, micrometer and control gages, Strain measurement-Experiment on strain measurement by strain gages, LVDT and practice, Force, displacement and acceleration measurement- Experiment with load cell, Coordinate measurement systems and reverse engineering, Profile measurement and surface engineering , Pneumatic measurement systems and practice, Temperature measurement- Experiment on temperature measurement, Electrical measurement basics, Resistance, capacitor, electrical signal basics, Power suppliers, current measurement, energy measurement, practice in lab.	1	2	2	Compulsory	3
<b>TRD122</b>	<b>Turkish Language II</b>	T	P	C	<b>Compulsory</b>	
	Types of oral and narrative expressions; methods of scientific research. Subject, aim, theme, plan. Writing a request. Report, essay. Column, article, critic, presentation. Letter, diary. Autobiography, biography. Travel log, conversation, interview, speech. Discussion about examination papers, evaluation of replies. Discussion on a random issue. Theatre, tale, poem. Story, novel. Conference, declaration, report, research paper. Scientific research methods: book, the usage of library and computer, reading, note taking. Formatting a book: Front cover, acknowledgements, inside cover, abbreviations, etc. Types, forms and rules of bibliographies. Footnotes.	2	0	2	Compulsory	2

<b>YDZA122</b>	<b>German II</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Kennenlernen, Begrüssung, Vorstellung, das Alphabet, Präsens: Konjugation, sein, Personalpronomen, Imperativ mit Sie, Aussagesatz, Fragesatz, Imperativ-Satz, Woher? Wo? Wohin?, Zahlen bis 100, Menschen und Dinge beschreiben, Nomen: unbestimmter, bestimmter Artikel; Singular/Plural, Menschen und Dinge beschreiben, Nomen: unbestimmter, bestimmter Artikel; Singular/Plural, Negation: nicht, kein, sein+Adjektiv, Zahlen ab 100, Wie hoch? Wie alt? Wie viele?, Uhrzeit (offiziell), Wochentage, ein Brief, Modalverben: möcht-, Satzklammer: trennbare Verben, haben und brauchen, Modalverben: können, müssen, Satzklammer: Modalverben, Pronomen: man Berufe, Aktivitäten in der Stadt, Akkusativ, Wechselpräpositionen: auf, in+ Akkusativ, Possessivartikel	2	0	2	Bir tane Yabancı Dil	2
<b>YDZF122</b>	<b>French II</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Les pronoms possessifs - maison ou appartement, Les pronoms personnels - l'appartement des Monsieur. Vincent, Les objet directs et indirects, Le conjugation des verbes en aler, ater, cer, ger, L'imparfait de l'indicatif, la dunie, L'adverbe -le metro, L'autobus, Le futur antérieur, le plus que parfait, Le participe present - la fête au vilage, Le conditionnel present - les sportifs, Le gerondif - une lettre	2	0	2	Bir tane Yabancı Dil	2
<b>YDZI122</b>	<b>English II</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Past simple tense, count and uncount nouns, comparatives and superlatives, present continuous tense, going to, question forms, present perfect tense, ever and never, just and yet, present perfect and simple past tense	2	0	2	Bir tane Yabancı Dil	2

### 3. SEMESTER

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>ATA121</b>	<b>Ataturk's Principles and The History of Turkish Renovation I</b>	T	P	C	<b>Compulsory</b>	
	General condition of the Ottoman Empire; General appearances of main European states before World War I; Relationship with Turkey and Europe, East Question, wars in 1911-1913; World War I, the position of the Ottoman Empire in World War I, fronts; Fronts, Dardanells Wars and its effects, partition plans on Empire during the World War I; Brest-Litowsk Treaty, principles of Wilson, other treaties with Bulgaria, Ottoman Empire, Germany and Austurian-Hungary states; Peace Summit in Paris, end of the World War I, economical condition of Ottoman Empire and laborer movements Mondros Armistice, minorities, the state of Ottoman army, cabinets, occupation of Smyrna; The beginning of the new period and Mustafa Kemal Ataturk, congresses, national assembly in Ankara; Fronts in independency wars, economical resources; Abrogation of regency, Lousanne Treaty and its importance, National Economic Congress, the foundation of parties, the announcement of Republic; The acceptance of secular law, social and cultural reforms, economical improvements, secular education and science; Principles of Ataturk and Turkish Republic, its content and concept	2	0	2	Compulsory	2
<b>MAM205</b>	<b>Mechanics II</b>	T	P	C	<b>Compulsory</b>	
	Particle kinematics, kinetics of particles: force and acceleration, Particle Kinetics: Work and Energy, Particle Kinetics: Impulse and momentum, planar kinematics of rigid bodies, force and acceleration, work and energy, impulse and momentum, three-dimensional kinematics of rigid bodies, rigid bodies kinetics of the three-dimensional, vibrations	2	0	2	Compulsory	4
<b>MAM311</b>	<b>Computer Aided Design (CAD)</b>	T	P	C	<b>Compulsory</b>	
	Introduction, Draft Module 2D drawing elements and solid modeling, surface modeling, assembly on the study, Simulation and Animation, Drawing on the work, sheet metal design and analysis Cosmosexpress.	2	2	3	Compulsory	4
<b>MAT285</b>	<b>Differential Equations</b>	T	P	C	<b>Compulsory</b>	
	Introduction to differential equations, relation with engineering sciences, general and special solution, First order differential equations, separable and homogeneous differential equations, Homogenized differential equations, Linear differential equations, Bernoulli differential equations, Exact differential equations, integrating factor, Second and high order differential equations, constant-coefficient homogeneous differential equations, Non-homogeneous constant-coefficient differential equations, Cauchy-Euler differential equations, Solution of variable -coefficient differential equations by series, Bessel differential equations	3	0	3	Compulsory	5
<b>MLM203</b>	<b>Materials Science and Inspection</b>	T	P	C	<b>Compulsory</b>	
	Classification of materials, atomic structure and bonding forces, the determination of crystal structures and properties determination, and analysis of phase diagrams, diffusion and convection mechanisms, destructive and nondestructive testing of materials, engineering materials, properties and application areas	2	2	3	Compulsory	5
<b>MRM201</b>	<b>Electromechanic Systems</b>	T	P	C	<b>Compulsory</b>	
	Electromechanical systems and components (relays, contactors, saturated reactors, DC AC motors, buttons, limit switches, thermostats) , operating principles, symbols, circuit connections, the solution according to different scenarios circuits, application circuits for basic problems.	2	0	2	Compulsory	5
<b>MRM203</b>	<b>Introduction to Numerical Systems</b>	T	P	C	<b>Compulsory</b>	
	Understanding of Boolean algebra and logic function minimization with use of Boolean algebra, map and Quine–McCluskey method. logic circuits desing with AND,OR,NOT,NOR,NAND gates and combinational logic devices. Flip flops and registers. Analysis of synchronous and asynchronous sequential circuits and next state/ output diagram formation. Design of synchronous sequential circuits following the steps word description, binary coded state table formation and flip flop input output equation derivation	2	2	3	Compulsory	5

#### 4. SEMESTER

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>ATA122</b>	<b>Ataturk's Principles and The History of Turkish Renovation II</b>	T	P	C	<b>Compulsory</b>	
	Turkish revolution and basic characteristics of Turkish revolution; The other revolutions that effected Turkish revolution; The aim of Turkish revolution: Democratic Law State; Establishment of secular Turkish secular law system; Establishment of Turkish secular education system Reconstruction of Turkish economy, national economic and globalization; Novelities that made the Turkish society contemporary General quality of Kemalist principles and republicanism; Nationalism; Etatism and Populism; Secularism; Revolutionism; Criticisms against Kemalist ideology and answers to them	2	0	2	Compulsory	2
<b>ELM204</b>	<b>Electrical and Electronical Circuits</b>	T	P	C	<b>Compulsory</b>	
	Diodes, BJT and FET transistors, Multiple Amplifiers, Frequency response of amplifiers, differential amplifiers, operational amplifiers, Feedback, Output stages and power amplifiers, Analog Integrated Circuits, Filters, tuned amplifiers, Signal Generators and Waveform shaping circuits, bipolar and MOS Digital Circuits, A / D and D / A converters. Computer-aided circuit analysis and design applications and experiments.	2	2	3	Compulsory	5
<b>MAM202</b>	<b>Strength of Materials</b>	T	P	C	<b>Compulsory</b>	
	Review and application of the principles of mechanical systems, elongation-stress concept, the mechanical properties of materials, detection, simple installations, the superposition technique and the calculations of tensile and compressive stresses, torsional stresses, and analysis of motor shafts, Bending stress, shear force and bending moment in beams,	3	0	3	Compulsory	5
<b>MAM208</b>	<b>Thermo-Fluidics</b>	T	P	C	<b>Compulsory</b>	
	The basic principles of thermodynamics. Properties of pure substances. Thermodynamic tables and diagrams of pure substances. Implementation of the first law of thermodynamics to closed systems. The second law of thermodynamics. Entropy. The general concepts of the fluid. Duran fluids. Bernoulli's equation and applications. System and control volume, mass, momentum and energy conservation equations. Navier-Stokes equations. Dimensional analysis and similarity. Flow in pipes and channels. Laminar and turbulent boundary layer. Pipe friction losses and terrestrial. Flow and pressure measurements. General expressions of heat transfer. In heat transfer. Heat conduction. Heat convection. Heat radiation.	3	0	3	Compulsory	5
<b>MAM312</b>	<b>Computer Aided Manufacturing (CAM)</b>	T	P	C	<b>Compulsory</b>	
	The Importance of Computer Aided Design and Manufacturing Industrial, Manufacturing Input and Material, NC, CNC and DNC 's Definition, Structural Properties of CNC Machines, Cutting Tools and Clamping Systems, CNC Programming, Structure, Cutting Remedies and Cutting Calculations, CNC' the G and M codes, Part Programming and CNC Manufacturing, CNC Parts Manufacturing	2	2	3	Compulsory	5
<b>MAT286</b>	<b>Numerical Analysis</b>	T	P	C	<b>Compulsory</b>	
	Solving systems of linear equations, Cramer's rule, Jacobi iteration, Gauss-Seidel method, Over-relaxation method, Gauss-Jordan and Gauss-Elimination methods, Solving systems of non-linear equations, Cramer's rule, Secant method, Newton-Raphson method, computer applications, Interpolation and extrapolation, linear interpolation, extrapolation using Taylor series, extrapolation with divided differences, Lagrange interpolation, Least squares approximations of power series, quadratic least square, exponentially weighted least square, trigonometric approximation of least square, computer applications, Numerical differentiation, numerical partial differentiation, Taylor series method and error analysis, numerical differentiation with divided differences, Lagrangien numerical differentiation, Numerical integration, rectangle rule, trapezoid rule, Simpson's 1/3 and 3/8 rules, computer applications, Multi-dimensional integrals, Romberg rule of integration, computer applications, Fourier series, Fourier coefficients, Fourier series of odd and even functions, Ordinary differential equations, Initial value problems, Euler method, taylor series method, Runge-kutta method, Boundary value problems, shooting method, finite difference method, partial-differential equations, Numerical solution of elliptic partial-differential equations (Laplace's Equation)	3	0	3	Compulsory	5
<b>MRM202</b>	<b>Microinspectors and Applications</b>	T	P	C	<b>Compulsory</b>	
	Introduction to microcontrollers, microcontroller architectures, microcontroller based embedded system and its specifications, PIC family microcontrollers, software model, internal/external memory maps, instructions and their operation, driving techniques of I/O ports, keyboard and display driving, internal peripherals, hardware interfacing.	1	2	2	Compulsory	3

5. SEMESTER

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
<b>IST345</b>	<b>Statistics for Engineers</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Basic concepts of probability and statistics, numerical and graphical methods of numerical and categorical data analysis, discrete and continuous probability distributions, estimation methods, hypothesis testing and regression.	2	0	2	Compulsory	3
<b>MAM301</b>	<b>Machine Elements I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Design materials, Stress, Design for dynamic loading, Joint elements, springs, roller bearings, plain bearings, gears, helical gears, bevel gears, worm gears and sprockets, clutches and brakes, Shaft.	3	0	3	Compulsory	4
<b>MAM310</b>	<b>Hydrolic-Pneumatic</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Introduction to hydraulic systems, Hydraulic systems and components of the structure, Location, pressure, time and counter-dependent control, Sequence control, Lead-by-step diagrams, Circuit design and personnel selection, Electro-Hydraulic Systems, Pneumatic Systems, Pneumatic circuit elements, Location, pressure, time, load-dependent control, Sequence control, Lead-by-step diagrams, Signal collision, Signal conflict solutions, Electro-Pneumatic Systems	2	2	3	Compulsory	5
<b>MRM300</b>	<b>Internship I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Summer practice of at least 36 workdays carried out in a suitable establishment with option courses followed third year. A comprehensive report is required which will combine the knowledge gained in the third year courses with the practical experience gained by the student.	0	4	2	Compulsory	4
<b>MRM301</b>	<b>Programmable Logic Controllers</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Structure of Programmable Logic Controllers(PLC), methods of PLC programing, Analog IO applications.	1	2	2	Compulsory	3
<b>MRM303</b>	<b>Mechanism of Robots</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Spatial Descriptions and Transformations, Positions, orientations and frames Mappings, translation and rotation operators Forward Manipulator Kinematics, link and link connection description Inverse Manipulator Kinematics, algebraic and geometric solution. Examples of manipulator kinematics Motion of the links of the robot, velocity propagation from link to link Jacobians Static forces in manipulators Acceleration of a rigid body Manipulator Dynamics, Iterative Newton Euler dynamic formulation Iterative vs. closed form solution Closed form dynamic equation examples Lagrangian formulation of manipulator dynamics Dynamic Simulation	1	2	2	Compulsory	3
<b>ELM331</b>	<b>Power Electronics</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	To give the students an appreciation of design and operational problems of the Power Electronic systems in industry.	2	2	3	Selective	4
<b>ELM333</b>	<b>Signal Processing Technics</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Topics covered in class mainly include principles and applications of digital signal processing. Representation, analysis, and design of digital signals and systems. Discretetime processing of continuoustime signals. Frequency domain representations: Fourier series and transforms. Decimation, interpolation, and sampling rate conversion. Time and frequencydomain design techniques for recursive (IIR) and nonrecursive (FIR) filters. Discrete Fourier transform (DFT) and fast Fourier transform (FFT). Shorttime Fourier analysis and filter banks.	2	2	3	Selective	4
<b>MAM371</b>	<b>Advanced Computer-aided Manufacturing</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Place of Computer Aided Manufacturing robot, with COSIMIR Robot Programming, Robot Programming with COSIMIR, COSIMIR with the robot program, the PLC heberleşmesi Robot, Robot Control with External Data, and Application Programming of robots, and CNC Robot Application, Robot and CNC Applications II, Rapid Prototyping, Rapid Prototyping and Coordinate Measuring Device with Measurement (CMM), Coordinate Measuring Device with Measurement (CMM), Welding Robot Welding, Welding Robot Welding	2	2	3	Selective	4
<b>MAM373</b>	<b>Mechanical Vibrations</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Dynamics review: units, complex numbers, FBD Dynamics review:kinematics, differential equations, matrices Lumped Parameter Modeling Free vibration of undamped single DOF systems Equivalent Mass, Equivalent Stiffness Rayleigh's Method Free vibration of viscouly damped SDOF systems Free vibration of damped SDOF systems with Coulomb and hysteretic damping Harmonically forced SDOF systems Harmonic motion of the base, rotating unbalance Forced vibrations of Coulomb-damped and hysteresis-damped SDOF systems Self-excited vibrations of Coulomb-damped and hysteresis-damped SDOF systems Periodically and non-periodically forced vibrations Free and forced vibration of 2 DOF systems	2	2	3	Selective	4

<b>MAM375</b>	<b>System Dynamics and Modelling</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Mechatronic system components, electrical, mechanical Mechatronic system components, fluid, thermal Modeling of mechatronic systems System mathematical equations State-space representation of equations State-space simulation of systems Laplace Transform Method Laplace transform simulation of systems Controls theory, PID Application, servopneumatic Application, servomotor Application, adjustment of PID parameters Root locus analysis Root locus based control parameter identification	2	2	3	Selective	4
<b>MAM377</b>	<b>Manufacturing Technics and Applications</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Production Methods, Formatting, Merge, surface treatment processes, material selection, Turning, Milling, Drilling, Grinding Machines	2	2	3	Selective	4
<b>MRM331</b>	<b>Biomedical Instruments</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Basic measurement and physiological concepts. Circuits, systems & Signals, biopotentials, electrical activity of excitable cells, membrane models Biopotentials: ECG, EMG, EEG, MEG, etc. Biopotential electrodes and amplifiers Measurement of blood flow and pressure Cardiovascular system, hemodynamics Measurements of the respiratory system Measurement of blood pressure Processing of biological signals Processing of biological signals continued Clinical laboratory systems Biomedical imaging systems Electrical safety Contemporary applications	2	2	3	Selective	4
<b>MRM333</b>	<b>Industrial Measurement and Applications</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	This course introduces to students Measurement concepts and methods that includes Industrial Measurement Systems and applications .	2	2	3	Selective	4
<b>MRM335</b>	<b>Image Processing</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	3-D Geometry Physics of light Perspective, Orthographic projection Camera properties Filtering, edge, color, shape, texture Filtering, shape, texture Feature detection Pattern comparison Computing temporal image change, magnitude, direction Fitting parameters to data, static, dynamic Applications, Motion compensation Structure from motion Categorization Clustering, segmentation	2	2	3	Selective	4



6. SEMESTER

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>IKT344</b>	<b>Engineering Economy</b>	T	P	C	<b>Compulsory</b>	
	This lesson deals with the concepts and techniques of analysis useful in evaluating the worth of systems, products, and services in relation to their costs	2	0	2	Compulsory	3
<b>MAM330</b>	<b>Automotive Mechatronics</b>	T	P	C	<b>Compulsory</b>	
	General view of automotive systems, to convey content, functions and working principle of engine management and safety systems, to present automotive systems, to put forth working principles of automotive systems and to examine behaviors of these variables under the different conditions and to show related applications in simulative medium and to gained quality of performing necessary measurements.	2	2	3	Compulsory	4
<b>MAM352</b>	<b>Automatic Control</b>	T	P	C	<b>Compulsory</b>	
	Automatic control, areas of applications and importance. Open and closed control concepts. Laplace Transforms. LT of defined functions. Inverse Laplace Transforms. System dynamics and mathematical model concept, linearization. Block diagrams, block algebra, open circuit, feedforward and feedback concept. Driving Transfer Function of mechanical system elements. Transfer functions of fluid systems. Transfer functions of thermal systems. Transient and permanent response of dynamic systems, first order system responses. Second order system responses curves. Simulations of first and second order system by using MATLAB software. Basic control effects and controller types used in automatic control: on-off, P, PI, PD, PID. Lab. Appl.: Precise position control of a hydraulics cylinder by using PID block. Lab. Appl.: Velocity control of a Servomotor system by using Computer. PLC and usage at automation systems. Lab. Appl. On MPS unit.	2	2	3	Compulsory	4
<b>MRM302</b>	<b>Design of Mechatronics System</b>	T	P	C	<b>Compulsory</b>	
	Mechatronics engineering design methods, structure and sub-components of the systems, Basic elements of automation, control units, sensors and actuators, Basic mechanical elements, removable and combining elements that can not be removed, screw, pins, riveted assemblies, Power and motion transmission elements, shafts and bearings, belt pulleys, toothed wheels, worm gear and money, the chain gear, Examples of power transmission applications-Shigley P913, Modeling and design methodology for mechatronic systems, advanced control techniques, Moving systems, linear motion and application accounts, Rotary movement and application accounts, Motor accounts applications, Mechatronics design applications with examples: vehicle electro-mechanical brake system, 3-axis CNC machine motor mechanics calculations, Step Motor Drive with Size Classification of CPC Ball Miller, Conveyor, Step motor-to-use applications index table account, Mechatronics Design for Product Life Planning Process- PLM, Design problems and the total design.	2	2	3	Compulsory	6
<b>MRM304</b>	<b>Sensing and Data Collection</b>	T	P	C	<b>Compulsory</b>	
	Sensor and transducers, classification (contact - non-contact, etc.) and characteristics. Signal conditioner modules and tasks. Temperature sensors: thermocouples, thermistors, and RTD, semiconductor temperature sensors, Cold Junction Compensation for thermocouples. RTD and thermistor 2-wire, 3 or 4 wire connection types. ADC-DAC concepts: resolution, sampling frequency. PCI data acquisition cards (DAQBoard), Serial, parallel, USB, GPIB interfaces. Distributed measurement and monitoring, Ethernet-based data acquisition hardware, hardware-software compatibility, LabVIEW graphical development environment.	2	2	3	Compulsory	5
<b>ELM332</b>	<b>Electrical Machines and Applications</b>	T	P	C	<b>Selective</b>	
	This course includes fundamental concepts and principles of operation of various types of electrical machines.	2	2	3	Selective	4
<b>MAM372</b>	<b>Advanced Manufacturing Technology</b>	T	P	C	<b>Selective</b>	
	Turning, Milling, Drilling, Grinding Machines applications	2	2	3	Selective	4
<b>MLM394</b>	<b>Material Selection and Analysis</b>	T	P	C	<b>Selective</b>	
	Classification of engineering materials, knowledge of the properties of materials, engineering materials, strength and density relations, the selection of electrical and magnetic properties, the material selection criteria are based on engineering designs	2	2	3	Selective	4

<b>MRM332</b>	<b>Digital Measurement</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	This Course introduces to students basic measurement concepts ,errors, digital measurement systems applications.	2	2	3	Selective	4
<b>MRM334</b>	<b>Advanced Mechanics of Robots</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Manipulator Dynamics, Iterative Newton Euler dynamic formulation Computation considerations Trajectory generation, joint space schemes Trajectory generation, Cartesian space schemes Path generation at run time Collision free path planning Manipulator mechanism design Quantitative measures of workspace attributes Stiffness and deflections Position sensing, force sensing Trajectory following control of manipulators Force control of manipulators Hybrid position/force control scheme Control in partially constrained tasks	2	2	3	Selective	4
<b>MRM336</b>	<b>Welding Technology with Robots</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Manufacturing automation and industrial applications, Component of manufacturing automation, welding automation, Arc and spot welding , Welding packet and basic tools ; welding machines, Positioner and slider design, Welding fixture design Fundamentals, Distortion in welding and precautions, Welding sensors, Design criteria of welding rooms; electronic and control, mechanical design, Tube welding and its systems , Calculation of welding time, cost calculation of welding room, Welding simulation, welding automation simulation	2	2	3	Selective	4
<b>MRM338</b>	<b>System Maintenance and Error Detecting</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Industrial Maintenance, Lubrication, Bearings - Belt Pulley - Chain Mechanisms - Couplings, Gear boxes - Sealing Elements, Compressors and Fans, Predictive Maintenance, Hydraulic and Pneumatic Systems Maintenance, The control system integrates Care and checking, Methods for fault detection, Electrical and electronic systems Maintenance and Troubleshooting, Fault Search Systems, Failure - Error - Maintenance Methods	2	2	3	Selective	4
<b>MRM340</b>	<b>Product Design and Prototyping</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	History of Contemporary Product Design, Drawing and Representations, Design Theory and Methodologies, Project Management, "Product Development", Product Development and Production, need, design, prototyping, test and analysis, new methods in prototyping, point clouds, solid modeling, transformation of point clouds to CNC codes, example manufacturing in workshops	2	2	3	Selective	4
<b>MRM342</b>	<b>Artificial Intelligent Systems</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Artificial intelligence, expert systems, fuzzy logic, artificial neural networks, Neuro-Fuzzy, Genetic Algorithm	2	2	3	Selective	4

**7. SEMESTER**

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
		T	P	C		
<b>MRM400</b>	<b>Internship II</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Summer practice of at least 36 workdays carried out in a suitable establishment with option courses followed third year. A comprehensive report is required which will combine the knowledge gained in the third year courses with the practical experience gained by the student.	0	4	2	Compulsory	4
<b>MRM401</b>	<b>Education at Workplace</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Students who have completed three years of their academic program work as an internship in an industrial or other engineering workplace at the first term of the fourth year. Then they return to the university to finish their academic education for a last term.	0	32	16	Compulsory	18
<b>MRM497</b>	<b>Graduation Project I</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Each student will study about a subject that will determine their BSc thesis subject. Literature survey will be conducted. Contents of the thesis will be written. Finally, completed thesis will be presented to the academic staff.	0	2	1	Compulsory	2
<b>YDI431</b>	<b>Technical Foreign Language I (English)</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	The terminology used in the field of Mechatronics Engineering, The grammar used in the field of Mechatronics Engineering, The rules of English used in technical writing, The rules of English used in presentation.	3	0	3	Compulsory	4
<b>BSB441</b>	<b>History of Science</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Science in ancient civilizations: Science in Egypt and Mesopotamia, Science in Ancient Greece and the Hellenistic Period, Science in Romans, Science in Medieval Europe and Islamic World, Renaissance and Modern Science: Situation in Astronomy, Chemistry, Medicine, and Biology; Situation in Physics and Mathematics; Galileo , Newton; Age of Enlightenment; Astronomy, Mathematics and Physics in 18th Century; Industrial Revolution and Science; Modern Science: Einstein's Revolution, Quantum Theory and The Birth of Atomic Physics	2	0	2	Selective	2

<b>BSB443</b>	<b>Environment and Energy</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Meeting with students and recognizing the related literature, basic ecology data, environment where we are living, artificial environment, politics of energy and environment, environment in the production and the usage of energy.	2	0	2	Selective	2
<b>BSB445</b>	<b>Report Preparation and Presentation Techniques</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	General issues in reporting and presenting. The students will be able to do own project report and presentations to tell the people in an effective way.	2	0	2	Selective	2
<b>DB441</b>	<b>Behavioural Science</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	The aim of this course is to give the students ability of analyzing the underlying reasons of human behavior in correlation with social, personal and psychological aspects. This course will examine the difference between human reactions, why behaviors change and how education occurs. A Mechatronics Engineer will work with people, be a manager or start their own company. Therefore in every way s/he will be surrounded by people. The second aim of this course is to socialize the students with group works, presentations, discussions and activities.	2	0	2	Selective	2
<b>DB443</b>	<b>Work Psychology</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	The importance of business psychology, personality and individual differences, motivation, perception, and farklıkları, a sense of responsibility	2	0	2	Selective	2
<b>ISL441</b>	<b>Entrepreneurship</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	The emergence of the concept of entrepreneurship, importance, purpose and basic functions, Basic functions and types of Entrepreneurship, Entrepreneurship Success and causes of failure, economic and social life of small businesses contributions to the advantages and disadvantages of small businesses, strong and weak aspects of the benefits and drawbacks of being a small business, Small business, The process of organization, institutions providing financing to small businesses, small business management, production, financing, small business production, financing, marketing and human resources issues related to the Small solutions to business problems.	2	0	2	Selective	2
<b>KSS441</b>	<b>City and Culture: Istanbul</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	To know Istanbul and its surroundings based on the interaction between the city and the culture	2	0	2	Selective	2

**8. SEMESTER**

Course Code	Course Name and Content	Kredisi			Selective/Compulsory	ECTS
<b>HUK444</b>	<b>Business Law and Ethics</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Law, right and obligation of working, employment law and contents of this law, Features and sources of employment law, employment organization, Debts due to employment (labor) contracts, Breathers, general holiday and annual leave of absence, Occupational health and safety, Wokin Ethics	2	0	2	Compulsory	3
<b>ISL444</b>	<b>Industrial Organization and Management</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Management systems, personal development strategies of leadership; vision, communication of meaning, development of trust through action, empower others, Management theory; planning, organizing, commanding, coordinating activities, controlling performance, Business managing, The bases for departmentation; marketing & sales, manufacturing, financial systems, human resources, management and organization.	3	0	3	Compulsory	5
<b>MAM452</b>	<b>Flexible Manufacturing Systems</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Introduction to Flexible Manufacturing Systems (FMS). Flexibility concept. Advantages and disadvantages of FMS. Robot Programming and simulation by using COSIMIR Educational software. Robot programming with Move Master and Melfa Basic IV. CIM system stations and their functions.	2	2	3	Compulsory	4
<b>MRM498</b>	<b>Graduation Project II</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	Each student will study about a subject that will determine their BSc thesis subject. Literature survey will be conducted. Contents of the thesis will be written. Finally, completed thesis will be presented to the academic staff.	0	2	1	Compulsory	4
<b>YDI432</b>	<b>Technical Foreign Language II (English)</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Compulsory</b>	
	The terminology used in the field of Mechatronics Engineering, The grammar used in the field of Mechatronics Engineering, The rules of English used in technical writing, The rules of English used in presentation.	3	0	3	Compulsory	4
<b>MAM472</b>	<b>Advanced Strength of Materials</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Transformations of Stress and Strain, integration with the slope and deflection method, moment area method, the slope and deflection, Statically Indeterminate Beams, Stress concentration, buckling	2	2	3	Selective	4
<b>MAM474</b>	<b>Advanced Automatic Control</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	The course aims at mathematical modeling and analysis of physical systems. Design of P, PI, PID controllers according to specified performance criteria and frequency response analysis. Modeling, transient, steady-state and stability analysis, dynamic controllers, design and frequency analysis of system response	2	2	3	Selective	4
<b>MRM432</b>	<b>Synchronous Coordinate Measurement (CMM)</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Design Process, Concept generation and selection , Rapid Sketching, Engineering Graphics, Project planning Product dissection ,Materials identification techniques,CAD systems and CMM machines,Software usage in reverse engineering,Desectioning and disassembly, Solid modelling and point clouds, Training on coordinate measurement machine, Rapid prototyping, Componentand assbly identification	2	2	3	Selective	4
<b>MRM434</b>	<b>Enclosed Systems</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Digital circuit design fundamentals and overview, Comparison of standard integrated circuits (eg, 74LS04) and programmable integrated circuits (eg FPGAs), advantages and disadvantages, A new approach to system design: language-based design method, hardware programming language(HDL) and overview, to emphasize the importance and need of hardware description languages, the most widely used in industry: Verilog, and VHDL, modeling, simulation and synthesis of digital logic circuits by using Verilog and/or VHDL languages, Programming methods: Structural model, data-flow model, behavioral model. Effective use of Computer Aided Design (CAD) tools (eg Modelsim) , Introduction to Xilinx ISE WebPack , ISE Design Suite (Xilinx)presentation platform, Various project developments by using Xilinx Spartan-3E development board: adders, multiplexers, comparator circuits, A / D, D / A converter applications, mouse-keyboard interface, 7-segment display and so on.	2	2	3	Selective	4

<b>MRM436</b>	<b>Technics of Positioning</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Rapid exercising and technical drawing rules review, Measurement techniques review ,Case studies about Measurement, CAD-CAM and CAE, Product examine and disassembly, Materials examination, CMM systems Laser scanning systems and measurement, Solid modeling and point clouds import, Fixtures and positioning Jigs and positioning, Case study in CMM, Rapidprototyping	2	2	3	Selective	4
<b>MRM438</b>	<b>Micromachines</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	History of micromachines, Micro system technology (MST) and micro-engineering. , Micro system design, General micro system principles, The engineering physics basis for micro system design, The rules for miniaturing , Characterization of Electronic materials and its selection, Micro manufacturing and fabrication techniques, Design methodology, Sample micro machine design, Automotive and aerospace applications, Energy, environment and bio technology application, Micro machine measurement techniques and application, Agriculture and smart house application	2	2	3	Selective	4
<b>MRM440</b>	<b>Autonomous Robots</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Sensors for dead reckoning, optical encoders, doppler sensors, mobility configurations Heading sensors, mechanical, piezoelectric, optical gyroscopes, geomagnetic sensors Ground based RF systems Global positioning systems Sensors for map based positioning Time of flight range sensors Phase shift measurement Active beacon navigation systems, Triangulation method Ultrasonic Transponder Trilateration Optical Positioning Systems Landmark Navigation Map-based Positioning, map building, map matching Vision-Based Positioning Landmark-Based Positioning	2	2	3	Selective	4
<b>MRM442</b>	<b>Virtual Manufacturing Design and Optimization</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	General overview on production systems. Virtual Manufacturing Design, CAD-CAM and CAE Applications in technology, Reverse engineering and CMM, 2 D and 3D Plant Design, PLM and product design applications, Integrated design principles in mechatronics, manufacturing automation and principles, Factory placement and plant design, Material flow analysis in facility, Production simulation, Design and simulation of robotic cell and automatin systems, Management of production processes, Production Optimization.	2	2	3	Selective	4
<b>MRM444</b>	<b>Numerical Control Systems</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Discrete-time modeling, transient and steady state response analysis and digital controller design, Z-transform, inverse Z-transform, state equations in terms of high order differential equations, numerical control block diagrams	2	2	3	Selective	4
<b>MRM446</b>	<b>Introduction to Finite Elements</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	What is FEA? History, Computer Aided Engineering applications, Industrial applications of finite element analysis and comparisons with analytical modelling, Bases of finite element analysis, D, 2-D ve 3-D modelling, principals of linear static analysis, Load concept, distributed load, coordinate transformation, Symmetry in FEA, modelling details, mesh creation, Study and preparation of basic elastic problem written by BASIC language, ANSYS ve MARC, Training on static analysis problems, Errors and convergence, Plastic deformation modelling, 2-D plastic deformation problems, Interpretation of FEA problems, Comparisons of analytical result and a problem result	2	2	3	Selective	4
<b>MRM448</b>	<b>Non-Destructive Health Monitoring of Materials</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	General information about the non-destructive inspection methods, the classification of non-destructive examinations, visual inspection methods, metallographic sample preparation and analysis techniques, ultrasonic inspection methods, x-ray examination, examination methods with gamma rays, penetration of liquid tests, and applications of electron microscopy, spectroscopy, in practice, job security	2	2	3	Selective	4
<b>MRM450</b>	<b>Process Control</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Fundamentals of general automatic and digital control. Modeling of first and high order systems. Functions and variables of process. PID controller algorithm. Applications of computer aided control.	2	2	3	Selective	4
<b>BSB442</b>	<b>History of Civilization</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Ancient Greek History, History of Urartu, the Uyghur History, History of the Khazars, Khorezm Empire History, Ghaznavids History, Alexander the Great Empire, History of the Oghuz Turks, Egyptian civilization, the Mesopotamian civilization, the Lydian Civilization, History of the Hittites, Phrygian civilization, History of the Byzantine Empire, the Romans Date , History of the Ottoman Empire.	2	0	2	Selective	2

<b>BSB444</b>	<b>Ottoman History</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Emergence of the Ottomans as a principality; Osman Gazi and Establishment of the Ottoman sultanate; The process of Orhan Bey and becoming a state; The Ottoman Empire until War of Ankara; Ottoman Empire from War of Ankara to the conquest of Istanbul; Fatih and the conquest of Istanbul; Ottoman Empire until the period of Yavuz Sultan Selim; Yavuz Sultan Selim and caliphate; Kanuni's Period; Organizations in Ottoman State; Decline of the Ottoman Empire; Activities to halt the decline; The Fall of the Ottoman Empire; Emergence of a new Turkish State in Anatolia	2	0	2	Selective	2
<b>BSB446</b>	<b>Social Organization</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Science concepts (science, theories, laws, rules, policies, systems, arguments, assumptions, hypotheses, methods) The process of scientific research, Scientific research methods Phases of scientific research methods, Scientific determination of the requirements for project preparation Scientific project preparation and identification of targets The emphasis on content creation and identification of projects, Project management and team building Extraction of the project results, evaluation of home in terms of content of statistical analysis, Dissemination of project results, Preparation of technical papers and articles Preparing scientific papers and general formatting As an effective presentation of data and presentation techniques, Ethical conduct and confidentiality agreements	2	0	2	Selective	2
<b>KSS442</b>	<b>Technical Communication</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Definition of Communication, Scope, Objectives and Key Features. Types of communication Communications and applications. Types of Communication: Nonverbal communication: Body language, appearance İletisimin Türleri: Written Communication. Professional Communication Meaning, Importance, Purpose and Functions Functioning of the communication: nonverbal communication in formal and informal forms of professional correspondence Reporting Techniques and Visual Communication: Form Editing, graphical, schematic Methods of Expression Virtual Organizational Communication, Organizational Communication Tools, Event Factors. Communication Barriers and Ways to Overcome the Barriers Information and Communication Technology Concepts and developments in this field	2	0	2	Selective	2
<b>PAZ444</b>	<b>Technical Sales and Marketing</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Marketing Concept Marketing Mix Marketing Research Marketing Plan Preparation Marketing Strategies	2	0	2	Selective	2
<b>YON444</b>	<b>Leadership</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	The definition and importance of leadership Basic approach to leadership Types of leadership Leadership theories and their properties The concept of management and administration Manager Lead manager Dynamic executive The differences between a leader and manager Communication and body language Planning, motivate Decision-making and problem-solving Visionary leadership Situational leadership	2	0	2	Selective	2
<b>YON448</b>	<b>Technology Management</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>Selective</b>	
	Create value from science and technology. Critical factors in technology management. Sources and types of the innovations. Case analysis on innovation. Technology and competitiveness of the company. Basic competences and technology life cycle. The commercialization of the technology. Technology strategy. Technology planning. Technology transfer. Green technology management. National innovation systems.	2	0	2	Selective	2