NEW CURRICULUM

VOCATIONAL SCHOOL OF HIGHER EDUCATION

MACHINE AND METAL TECHNOLOGIES PROGRAM

2019-2020 CURRICULUM

I.SEMESTER

COURSE CODE	COURSE TITLE	Z/S/M	T	U	TS	TK	ECTS
MAK101	Technical Drawing	M	2	2	4	3	6
MAK103	Basic Manufacturing Processes	M	2	2	4	3	5
MAK105	Basic Physics	M	3	0	3	3	4
BİL101	Information and Communicatior	Z	2	0	2	2	3
MAT101	Mathematics-I	Z	2	0	2	2	3
TD101	Turkish Language-I	Z	2	0	2	2	2
YD101	Foreign Language-I	Z	2	0	2	2	2
ATA101	Atatürk's Principles and Revolu	Z	2	0	2	2	2
	TOTAL		**17**	**4**	**21**	**19**	**27**
ELECTIVE COURSES (**)							
S101	Occupational Health and Safety	S	2	0	2	2	3
S103	Communication	S	2	0	2	2	3
S105	Energy Conversion Systems	S	2	0	2	2	3
S107	Life Skill and Social Activity	S	2	0	2	2	3
S109	University and Career Success	S	2	0	2	2	3
	GRAND TOTAL		**19**	**4**	**23**	**21**	**30**

2019-2020 CURRICULUM

II.SEMESTER

COURSE CODE	COURSE TITLE	Z/S/M	T	U	TS	TK	ECTS
MAK102	Mechanical Job Picture	M	1	2	3	2	5
MAK104	Computer Aided Drawing-I	M	2	2	4	3	5
MAK106	Material Technology	M	3	0	3	3	5
BİL102	Information and Communication	Z	2	0	2	2	3
MAT102	Mathematics-II	Z	2	0	2	2	3
TD102	Turkish Language-II	Z	2	0	2	2	2
YD102	Foreign Language-II	Z	2	0	2	2	2
ATA102	Atatürk's Principles and	Z	2	0	2	2	2
DOY102	Digital literacy	Z	0	0	0	0	3
	TOTAL		**16**	**4**	**20**	**18**	**30**
ELECTIVE COURSES (**)							
S102	Strength	S	2	0	2	2	3
S104	Welding Technology	S	2	0	2	2	3
S106	Entrepreneurship	S	2	0	2	2	3
S108	Environmental Protection	S	2	0	2	2	3
S110	Professional Ethics	S	2	0	2	2	3
	GRAND TOTAL		**18**	**4**	**22**	**20**	**33**

III.SEMESTER

COURSE CODE	COURSE TITLE	Z/S/M	T	U	TS	TK	ECTS
MAK201	CNC Lathe Technology	M	2	2	4	3	5
MAK203	Computer Aided Drawing-II	M	2	2	4	3	5
MAK205	Machine Elements	M	2	0	2	2	3
MAK207	Thermodynamics	M	3	0	3	3	3
MAK209	Manufacturing Processes	M	2	2	4	3	5
MAK211	Engines	M	3	0	3	3	4
	TOTAL		**14**	**6**	**20**	**17**	**25**
ELECTIVE COURSES (**)							
S201	Measurement and Control	MS	3	0	3	3	5
S203	Basic Forming Processes	MS	3	0	3	3	5
S205	Basic Energy Sources	MS	3	0	3	3	5
S207	Electric Electronic Information	MS	3	0	3	3	5
OSD	Common Elective Course	S	3	0	3	3	5
	GRAND TOTAL		**17**	**6**	**23**	**20**	**30**

IV.SEMESTER

COURSE CODE	COURSE TITLE	Z/S/M	T	U	TS	TK	ECTS
MAK202	CNC Milling Technologies	M	2	2	4	3	4
MAK204	Computer Aided Manufacturing	M	2	2	4	3	4
MAK206	Hydraulic and Pneumatic	M	3	0	3	3	3
MAK208	Unconventional Production Meth	M	3	0	3	3	3
MAK210	Project Design	M	2	0	2	2	3
MAK212	Engineering Science	M	3	0	3	3	3
	Internship	Z	0	0	0	0	5
	TOTAL		**15**	**4**	**19**	**17**	**25**
ELECTIVE COURSES (**)							
S202	System Analysis and Design	MS	3	0	3	3	5
S204	Heat Treatment in Castings	MS	3	0	3	3	5
S206	Quality Assurance and Standard	MS	3	0	3	3	5
S208	Scientific Research Methods	MS	3	0	3	3	5
OSD	Common Elective Course	S	3	0	3	3	5
	GRAND TOTAL		**18**	**4**	**22**	**20**	**30**

**Only one of the elective courses will be selected

MACHINE TECHNOLOGY PROGRAM COURSE CONTENTS

I.SEMESTER

TD101- Turkish Language-I (2 + 0)

Definition of language, its features, language-nation, language-thought and language-culture relationship. Languages in the world and the place of Turkish among world languages. Historical development of Turkish language. Ataturk's language revolution, language understanding, language studies. Sound features of Turkish language, sound events. Spelling rules and practice. Punctuation. Vocabulary, root-suffix and body, suffixes, inflectional suffixes, word derivation ways. Turkey Turkish Past Items from Foreign Language.

ATA-101 Atatürk's Principles and Revolution History-I (2 + 0)

Explanation of Revolution and Similar Concepts, Reasons of Decline of the Ottoman State, Political Situation and Disintegration of the Ottoman State in the 19th Century, Tanzimat Period, Constitutional Period, Tripoli and I.-II. Balkan Wars, Causes and Consequences of World War I, Mustafa Kemal Pasha, Erzurum and Sivas Congress, the National Pact and the Opening of Grand National Assembly of Turkey

YD-101 Foreign Language-I (2 + 0)

Introducing yourself and friends, greeting, possessive adjectives, numbers, spelling names and numbers, English Alphabet. Writing names and numbers. Asking and answering the location of objects. Definitions (a, an, the,) Yes no questions. Where pronoun pronoun and 'To Be' questions are the pronunciation of plural words ending in -s. Prepositions of the place, listening and writing about the places of objects, "Where are you from?" Talking about cities and countries, “To Be” verb, positive and negative sentences, Yes-No questions and short answers. Who- questions, listening and writing about people, adjectives about personality and appearance. Asking and answering questions about clothes and colors. Talking about weather and seasons, possessive adjectives and possessive pronouns, listening and writing exercises about clothes and colors. "but" and "and" conjunctions. Present tense. Asking and saying time, Time expressions. Who-questions in the Present Time, "so" conjunction, Listening and writing about time and actions, Defining daily routine work, Talking about family members, Wide Time. Time expressions, Third person singular -s pronunciation. Writing and listening exercises about daily activities, Times.

MAT-101 Mathematics-I (2 + 0)

Basic concepts (numbers, number systems, digit concept etc.), prime factors, exact divisor number, division and divisibility rules, OBEB and OKEK, ordering, simple inequalities, base arithmetic, equation solving, factorial, absolute value, exponential and rooted numbers ,

factoring, identities, angles, angle-edge relations, bisector, kenarortay, triangles (right, equilateral, special etc.), polygons.

MAK-105 Basic Physics (3+0)

Unit systems, vectoral, force and moment, equilibrium and equilibrium conditions, center of gravity, laws of motion, work, power, energy, heat and temperature, heat transfer and heat transfer types: conduction, convection and radiation, basic fluid properties, types of flow and flow calculation, flow in ducts and pipes, pressure loss.

MAK-101 Technical Drawing (2 + 2)

The place and importance of technical drawing in industry, drawing tools, writing and numbers, lines and types, making geometric drawing, definition and classification of concept of appearance and projection, plane types of projection, dimensioning, definition and importance of perspective, expression with one and two views Drawing the perspective of the piece, the perspective of the parts expressed in three views, the perspective of the circle, the definition and importance of sectioning, section lines and angles, scanning principles, section applications, tolerance, surface treatment marks.

MAK-103 Basic Manufacturing Processes (2 + 2)

File, cutter types, measuring control and marking tools, cutting principles and types, cutting tools suitable for the material, footed sanding machine tools, drill sharpening, drill types, drill bit angles, material properties of the parts and drills to be drilled, drilling process sequence, cycle calculation , reamer, guide, die taps, screw combs, tapping and tapping with screw tapping process, turning bench types, parts, turning types, mirrors, bearings, cutting tools, turning pens, types, tailstock drill, rotational speed amount calculations, butt and cylindrical turning process sequence, surface roughness, channel pencil types, sharpening angles, measuring tools, taper turning methods, taper calculation, taper measuring gauges, drill types, drill hole principles, caterpillar types, screw types, gages, screw pencil types , screwing in blind holes, number of mouths in screws, types of machine reamer, reaming techniques in lathe, workpiece reamer co-exhausted Multiple bonding technique, Milling benches, surface milling knives, pocket knife fasteners, chip depth and feed rate calculations, Milling directions, parallel connection of the workpiece, Groove and pocket milling knife types, groove milling safety measures simple splitting, splitting apparatus, Grinding benches, types and properties of grinding stone, Balancing methods, stone bonding techniques, Stone sharpening technique.

BIL101-Information and Communication Technologies-I (2 + 0)

Preparing presentations (Microsoft Powerpoint and applications), Databases (Microsoft Access and applications), Computer Networks (definition, components, types, topologies of computer network), Internet (definition, brief history, basic concepts related to internet, browsers), HTML language and web page preparation, HTML Editor (Microsoft Frontpage), Data communication and using information networks (e-mail, discussion groups, file transfer, forums, search engines).

ELECTIVE COURSES:

S-101 - Occupational Health and Safety (2 + 0)

Occupational Health and Safety Historical Development of Occupational Health and Business Purpose and Importance of Safety Health and Concepts of Health in Turkey in the Safety Area and Safety of Overview of Job Accidents Occupational Diseases Occupational Accidents and Occupational Be Taken Against Disease Precautions Work Accidents and Occupational Diseases of nature Costs, Occupational Health and Safety in Basic Law Laws National and International Organizations and Contracts Occupational Health and Safety Management Systems Risk Management and Evaluation Personal Protective Equipment.

S-103- Communication (2 + 0)

Verbal Communication, Written Communication, Nonverbal Communication, Formal (Formal), Communication, Non-Formal (Informal) Communication, Non-Organizational Communication.

S-105- Energy Conversion Systems (2 + 0)

Energy Conversion and Efficiency Concept, Combustion Based Technologies (Internal Combustion Engines, Gas Tribunes, Steam Tribunes, Catalytic Reactors), Non-Combustion Based Technologies (Fuel Cells, Biological Reactor, Solar Eyes, Water Tribunes, Wind Tribunes).

S-107- Life Skill and Social Activity (2 + 0)

Knowing yourself, knowing what is the phenomenon of self, how it is formed, knowing the relationship between behaviors and being individual, knowing the definition of communication, effective communication, problem areas in communication, communication conflicts, empathy skills -I know the language and the no problem area Knowing the conflict situations, the no problem losing solution in conflict resolution Anxiety, stress etc. knowing difficult emotions, knowing physical coping skills and related techniques Knowing rational thoughts and rational coping skills Knowing decision making steps and healthy decision making methods Knowing coping methods against harmful substances, resisting peer pressure against substance use Knowing career plan and career create the plan.

S-109- University and Career Success (2 + 0)

Career management and conceptual framework, career management process, tools and practices that form the organizational dimension of career development, career cycles of employees, career problems and solutions will be discussed.

II. SEMESTER

MAK-104 Computer Aided Drawing-I (2 + 2)

Using the screen editing and drawing auxiliary commands, selecting the options for running BDC software, adjusting the display and drawing settings and closing the BDÇ software, drawing and using coordinate systems using basic drawing commands, drawing technical drawings using drawing commands, adding text to drawings, technical using drawing commands drawing pictures, adding text to drawings, using editing commands, changing the properties of drawing elements, duplicating drawing elements, making dimensioning adjustment, using dimensioning commands, changing dimensions, adding surface treatment marks and adding tolerances, making 2D data transfer between BDC software Using file extensions for 2D (two-dimensional) data transfer, selecting the printer defined by printing, selecting the paper size to be used for printing, determining the area to be printed, selecting the printing scale.

TD-102 Turkish Language-II (2 + 0)

Sentence Structure, Wordings, Sentence and Sentence Composing Elements, Sentence Types, Sentence Analysis, Sentence Inspection Examples, Composition, Communication, Creative, Fictional Writings, Thought and Knowledge Transfer Writings, Petition, Legal Writings (Minutes, Announcements, Reports, Business Letters and CV), language mistakes (spelling and punctuation mistakes, Expression Failures, Voice Based Faults).

ATA-102 Ataturk's Principles and History of Revolution-II (2+0)

Kuva-yi Milli and Fronts (Adana, Antep, Marash, Urfa), establishment and West Front of the Regular Army, Sakarya War and its results, the Commander in Chief Battle and the results, Mudanya Armistice and Lausanne Conference, the abolition of the Sultanate, the Republic of Turkey's installation, Establishment of Turkish Historical Society and the Turkish Language Society, Ataturk's principles, secular State Formation Process in Turkey, the development of democracy in Turkey, the Turkish modernization Dynamics, Armenian and the Cyprus problem are processed.

YD-102 Foreign Language-II (2 + 0)

Word structures, adjectives, prefixes, summarizing. Scanning, main ideas and word structures, conjunctions. Cause and effect relationship, word structures. Opposite words are two-word verbs compound words. Word structures, prefixes, conjunctions and summarization. Passive sentences. Improving reading, writing and listening skills.

MAT-102-Mathematics-II (2 + 0)

Ratio-proportion, equation solving, problems (number, fraction, age, worker, pool, percentage, profit, loss, mixture, speed, time etc.), sets, relations and functions, operation,

modular arithmetic, permutation, combination, probability , parallelogram, trapezoid, circle, circle, area calculations, analytical geometry.

MAK-102 Mechanical Job Picture (1 + 2)

Detachable joints, Non-removable joints, Safe fasteners, Motion Elements, Power Transmission Elements, Assembly picture and detail picture concepts, Draw assembly and detail picture, Assembly and assembly order, Assembly picture and detail picture applications, Assembly and detail picture letterheads, Draw sketch.

MAK-106 Material Technology (3 + 0)

Materials used in the technical field, Basic concepts of atomic structure, Basic concepts of solidification and melting, Solidification and cooling curves of pure and alloyed metals, Dendrite and grain formation during solidification Crystal defects, Pure metal, Intermediate or compound and solid solution, Standard representations of alloy steels, Alloys dissolved in each proportion in liquid state, partially dissolved and never dissolved in liquid and solid state, Solid state transformations, Cooling curve of pure iron and allotropic change, Iron cementite phase diagram and transformations in iron cementite phase diagram, Softening tempering, Normalization annealing, Globalization annealing, Stress relief annealing, Quenching hardening, Martensitic structure, Isothermal transformation diagrams, Tempering, Carburizing surface hardening, Nitriding surface hardening, Flame surface hardening, Induction Hardening, Elastic, plastic deformation and breakage, Sample sampling, molding, t grinding and polishing, etching, Structural evaluation with microscopes and microscope, Stress elongation curve obtained after tensile test, Hardness measurement methods, Fracture energy after impact test, SN diagram after fatigue test, Visual inspection method, Penetrant fluid examination method, Ultrasonic inspection method X-ray inspection method, Magnetic inspection method.

BİL-102-Information and Communication Technologies-II (2 + 0)

Data types, Variables, Loops, Algorithms, Flow Chart, Control Structures.

ELECTIVE COURSES:

S-102 Strength (2 + 0)

Elements under normal force, Elements exposed to torsional moment, Elements exposed to bending moment, Elements exposed to combined strength states, Elements loaded vertically, Elements under buckling loads.

S-104 Welding Technology (2 + 0)

Gas melting welding, Electric arc welding, MIG / MAG welding, TIG welding

S-106 Entrepreneurship (2 + 0)

It covers the entrepreneurship concept and its emergence, small business types, establishment, management, creativity and entrepreneurship, entrepreneur characteristics, entrepreneurship types, business plan preparation, entrepreneurship support and conditions.

S-108 Environmental Protection (2 + 0)

Environmental Regulation Information, Risk Analysis, Waste Storage, Personal Protection Measures, International Health and Safety Alerts, Occupational Health and Safety Regulation

S-110 Professional Ethics (2 + 0)

Examining the concepts of ethics and morality, Examining the ethical systems, Examining the factors that play a role in the formation of morality, Examining the ethics of profession, Examining the consequences of unethical behaviors in professional corruption and professional life, Examining the concept of social responsibility.

III. SEMESTER

MAK-201 CNC Lathe Technology (2 + 2)

Features of CNC lathe machine, Parts of CNC lathe machine, Operating principles of CNC lathe machine, Machine coordinate axes, Reference points, Control panel types, Control panel keys and properties, Cutter and workpiece material relationship, Cutter types, properties and places of use, Tool compensation settings, Tool holders and fasteners, Zero points on the parts, Properties of the elements used in resetting, Resetting the tool according to the workpiece, Elements and features used in the tool setting, Cutting depth, processing angle and advances, Tool rough machining depth calculation, Binding apparatus, Binding control tools, Workpiece reset methods, Programming principles in CNC lathe lathes, Positioning systems, Operation and preparation commands, Auxiliary commands, Special commands, Motion systems in CNC Lathe lathes, Coordinate systems, Movement types, Control types, Axes, Definition and importance of simulation, Simulation Programs, Program run, Programming using cycles on CNC turning, Face turning cycle, Longitudinal rough turning cycle, Radius chamfering cycle, Grooving cycle, Programming using CNC turning cycles, Profile rough cycle, Groove groove cycle, Deep hole drilling cycle, Threading cycle , Sub-programming technique, Sub-programming structure, Program using sub-program in CNC lathe, Alarm options in CNC machines, Error codes used in programming, Machine advance mode settings, Measurement and control.

MAK-203 Computer Aided Drawing-II (2 + 2)

Three-dimensional drawing program commands and operation of BDC software, Using the menu and toolbars, Draft drawing and running draft drawing commands, Using draft dimensioning commands, Three-dimensional solid modeling, Rotate solids and sweep solids, Mirroring solid models, Three-dimensional surface modeling, Three-dimensional model

assembly, Technical drawing of three-dimensional model, Creating the basic view, Creating auxiliary views and dimensioning the views, Data transformation between BDC software.

MAK-205 Machine Elements (2 + 0)

Non-removable fasteners, Detachable fasteners, Shafts and axles, Bearing elements.

MAK-207 Thermodynamics (3 + 0)

Basic concepts (system, environment, change of state, cycle), zeroth law of thermodynamics, heat and work transformations, thermodynamic properties of pure substance (property relations, pv, Ts diagrams), thermodynamic properties of pure substance (Property relations, pv, Ts diagrams), Ideal gas equation and state changes of ideal gases, 1st Law of Thermodynamics, 2nd Law of Thermodynamics, Engine cycles, Comparison of cycles, Internal combustion engines, efficiency, power, Engine performance characteristics, Fuels, physical and chemical properties, physical analysis of combustion, chemical properties, Combustion in spark ignition engines, Combustion ignition engines, classification of combustion fuels, hydrocarbons, alcohols and their derivatives, classification of combustion, combustion equations, end products and analysis of combustion, tables related to fuel and combustion, alternative fuels and combustion, Knock caused by combustion in engines evaporation of fuels, knock strength.

MAK-209 Manufacturing Processes (2 + 2)

Definition and usage places of the rack gear wheel, Racking gear wheel manufacturing techniques, Racking gear wheel calculations, Choosing the module milling knife for the rack gear, Control of the gear opened by the module caliper, Conical gear wheel definition and usage places, Bevel gear wheel manufacturing techniques, Bevel gear Wheel calculations, Choosing the bevel gear module milling knife, Control of the gear opened by the module caliper, Worm screw and counter gear wheel definition and usage places, Worm screw and counter gear wheel manufacturing techniques, Worm screw and counter gear wheel calculations, Choosing the module milling knife, Control of the gear opened by the module caliper, Chain gear definition and usage areas, Chain gear manufacturing techniques, Chain gear calculations, Choosing the milling knife for chain gear, Hole grinding, Definition and importance, Tools and equipment used, Measuring and control in hole grinding, Definition of taper and properties, Taper calculation, Taper grinding, Definition and importance, Use Tools and equipment, Measurement and control in conical grinding, Centerless grinding lathes, Centerless grinding definition and importance, Tools and materials used in centreless grinding, Centerless grinding, Measuring and control, Tool sharpening stones. grinding, grinding of multi-blade cutters.

MAK-211 Engines (3 + 0)

Physical Controls of Engine Systems, Cooling and Lubrication Systems Ignition System and Controls Diagnostic Devices Diagnostic Tester Cables and Connections Fault Scanning in

Engine Systems ECU (Electronic Control Unit) Fault Codes ECU Memory Fault Clearing Parts Introduce ECU Compression Test, Cylinder Leak Tester Exhaust Emissions and Controls, Catalytic Converters Vehicle Indicator Systems and Controls Valve Mechanisms, Variable Valve Timing Diagnostics Test Controls Solenoid Valve Controls Sensor Controls Lubrication Line Controls Engine Tests (Power, Moment, Fuel Consumption, Air Consumption, Specific Fuel Consumption, Volumetric Efficiency, Thermal Efficiency) Engine Tests (Power, Moment, Fuel Consumption, Air Consumption, Specific Fuel Consumption, Volumetric Efficiency, Thermal Efficiency) Vehicle tests.

ELECTIVE COURSES:

S-201 Measurement and Control (3 + 0)

It is aimed to gain the competences to measure and control the machine parts. Calipers Angle measurement, Micrometers Surface roughness measurement, Measuring screws, Measuring gear wheels, Surface inspection with gauges and optical glasses, Performing shape tolerance control, Performing dimensional tolerance control.

S-203 Basic Forming Processes (3 + 0)

With this course, it is aimed to provide the students with the qualifications of measurement and control, basic leveling operations, cutting and twisting processes within the scope of basic shaping processes.

S-205 Basic Energy Resources (3 + 0)

What Is Energy, How It Is Spread, Energy Types (Solar, Fossil Fuels; Oil, Coal, Natural Gas, Rock Gas etc.), Wind Energy, Hydro Energy, Geothermal Energy, Nuclear Energy, Tidal (Wave Energy), Sustainability of Conventional Energy Resources.

S-207 Electric Electronic Information (3 + 0)

Operating principles of passive and active circuit components used in electronics, Ohm and Kirchoff rules, Basic laws of electromagnetism, Operating principles of electrical machines, Micro and PLC controllers, Mechatronic systems, Sensors.

IV. SEMESTER

MAK-202 CNC Milling Technology (2 + 2)

CNC milling machine features, parts and working principles, Machine coordinate axes, Reference points, Control panel types, Cutter and workpiece material relationship, Cutter types, features and usage places, Zero points on parts, Cutting depth, angle of operation and giving progress, Programming principles in CNC Milling machines, Motion systems in CNC Milling machines, Definition and importance of simulation, Simulation programs, Program running, Programming using CNC milling cycles, Rectangular pocket milling cycle, Programming using CNC milling cycles, Circular pocket milling cycle, Programming using CNC milling cycles , Drilling cycle, Tapping cycle, Hole expansion cycle, Sub-programming

technique, Sub-programming structure, Alarm options in CNC milling machines, Programming using CNC sub-program, Measurement and control.

MAK-204 Computer Aided Manufacturing (2 + 2)

Transfering the two-dimensional workpiece to the machining part, Determining the tool path, Selecting the insert and insert holder to be used, Creating the insert and tool holder, Selecting the operation to be used, Surface milling process, Rough and intermediate rough milling process, Drilling process, Profile milling process, Channel milling process, Precision (finish) milling process, Simulating tool paths, Transfering the three-dimensional workpiece to the machining part, Determining the tool path, Choosing the cutting tool and tool holder to be used, Creating the cutting tool and holder, Selecting the process to be used, Surface milling process, Rough and intermediate rough milling process, Drilling process, Profile milling process, Channel milling process, Helical milling process, Precision (finish) milling process, Precision surface and edge cleaning process, Simulation of tool paths, 4 axis milling process, Indexing 4 axis machining, Continuous (simultaneous) 4 axis machining, Drilling, Surface wrapping (Wrap), Rough milling, Finishing milling making me, simulating tool paths, choosing 5 axis operation to be used, rough milling process, drilling process, profile milling process, side wall machining (swarf), precision (finishing) milling process, simulating tool paths, machine to derive CNC codes Choosing a code generator (postprocessor), deriving CNC codes, data transfer methods to CNC milling machine, data transfer methods from CNC milling machine, preparation for CNC milling machine to process parts, machining parts in CNC milling machine via created tool.

MAK-206 Hydraulic and Pneumatic (3 + 0)

Identifying Hydraulic Circuit Elements, Creating Hydraulic Circuit Schemes, Detecting the Failures of Hydraulic Systems, Fixing Hydraulic Faults, Identifying Pneumatic Circuit Elements, Creating Pneumatic Circuit Schemes, Creating Electropneumatic Systems, Determining the Faults of Pneumatic Systems, Eliminating Pneumatic Faults, Making periodic controls of the systems. Performing Periodic Maintenance, Fault Detection, Repairing the Defective Machine.

MAK-208 Unconventional Production Methods (3 + 0)

Features of electro erosion machine, Parts of electro erosion machine, Operating principles of electro erosion machine, Machine coordinate axes, Reference points, Control panel types, Control panel keys and properties, Electro erosion machine processing methods, Electrode materials, Di electrical fluids, Electrode and part positioning Methods, Parts reset methods, Electro erosion machine operating modes, Electro erosion machine processing parameters, Sample part processing applications, Wire erosion machine features, Wire erosion machine parts, Wire erosion machine working principles, Machine coordinate axes, Reference points, Control panel types, Control panel keys and their properties, Machine programming methods, Wire erosion machine processing methods, Cutting wire materials and properties, Wire binding methods, Wire positioning options, Workpiece binding methods, Cutting fluid types and properties, CNC wire erosion machines programming principles Positioning systems,

Absolute positioning system, Incremental positioning system, ISO Operation and preparation commands, Wire movement direction selection, Diameter compensations and offsets, Setting the slope angle, Simulation options, Power dropping functions in corners and slopes, Editing generator values operations.

MAK-210 Project Design (2 + 0)

With this course, it is aimed to gain the competences of students to make tensile, compression, bending, shear and torsional strength calculations within the scope of project design processes.

MAK-212 Engineering Science (3 + 0)

Circular Motion, potential-kinetic energy and momentum, simple machines, liquid fluids, heat energy and effects, basic gas laws.

ELECTIVE COURSES:

S-202 System Analysis and Design (3 + 0)

Feasibility study, Realization of the project, Project conversion into a report, Presentation of the project

S-204 Heat Treatment in Castings (3 + 0)

Stress Relieving Heat Treatment for Steel Castings, Softening Heat Treatment, Normalization Heat Treatment, Hardening Heat Treatment, Stress Relieving Heat Treatment for Cast Iron, Estempering Heat Treatment, Artificial Aging Heat Treatment for Aluminum Alloys, Natural Aging Heat Treatment for Aluminum Alloys.

S-206 Quality Assurance Systems and Standards (3 + 0)

Concept of Quality, Standard and Standardization, The importance of the standard in the production and service sector, Management quality and standards, Management quality and standards, Environmental standards, Environmental standards, Quality management system models, Quality management system models, strategic management, Strategic management, Participation in management, Process management system, Resource management system, Resource management system, Efqm excellence model, Quality control in production, Inspection and sampling, Inspection and sampling, Total quality control, Total Quality Control, Control Diagrams, Statistical Distributions.

S-208 Scientific Research Methods (3 + 0)

Scientific Research Methods, Science and basic concepts (fact, knowledge, absolute, true, false, universal knowledge, etc.), basic information about the history of science, the structure of scientific research, scientific methods and different views on these methods, problem, research model, universe and sampling, data collection and data collection methods, data recording, analysis, interpretation and reporting.