FIRAT UNIVERSITY
ELAZIG ORGANIZED INDUSTRIAL ZONE VOCATIONAL SCHOOL
NATURAL GAS AND INSTALLATION TECHNOLOGY PROGRAM

1ST GRADE FALL SEMESTER (I. SEMESTER)

C.CODE	COURSE NAME	T	U	K	Z/S	ECTS
TRD109	Turkish Language-I	2	0	2	Z	2
YDİ107	English Language-I	2	0	2	Z	2
MAT101	Mathematics-I	3	0	3	Z	4
OGT101	Technical Drawing	3	2	3	Z	4
OGT103	Fundamentals of Electricity-I	3	0	4	Z	4
OGT105	Scientific Principles of Technology	3	0	3	Z	4
OGT107	Fundamentals of Plumbing -I	3	1	4	Z	5
OGT109	Basic Information Technologies	2	2	3	Z	2
OGT111	Research Methods and Techniques	2	0	2	Z	3
	TOTAL	**23**	**5**	**26**		**30**

Abbreviations: Z = Compulsory course; S = Elective course; T = Theoretical course hours;
U = Practice lesson hours; K = Course credit; ECTS = European Credit Transfer System

1ST YEAR SPRING SEMESTER (2ND SEMESTER)

C.CODE	COURSE NAME	T	U	K	Z/S	ECTS
TRD110	Turkish Language-II	2	0	2	Z	2
YDİ108	English Language-II	2	0	2	Z	2
MAT102	Mathematics-II	3	0	3	Z	4
OGT102	Fundamentals of Plumbing -II	2	2	3	Z	5
OGT104	Quality Assurance and Standards	3	0	3	Z	4
OGT106	Fundamentals of Electricity-II	3	0	3	Z	5
OGT108	Material Information	3	0	3	Z	4
	Elective	2	0	2	S	2
	Elective	2	0	2	S	2
	TOTAL	**22**	**2**	**23**		**30**
ELECTIVE COURSES (Two courses will be chosen from the following)						
OGT110	Communication and Ethics	2	0	2	S	2
OGT112	Solar Energy and Applications	2	0	2	S	2
OGT114	Hydraulic and Pneumatic Systems	2	0	2	S	2

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2ND GRADE FALL SEMESTER (III. SEMESTER)

C.CODE	COURSE NAME	T	U	K	Z/S	ECTS
AİT209	Atatürk's Principles and Revolution History-I	2	0	2	Z	2
OGT203	Natural Gas Installation Application Principles	3	0	4	Z	4
OGT205	Alternative Energy Sources	3	0	4	Z	3
OGT207	Pipe Welding	3	1	4	Z	3
OGT209	Internship Evaluation	0	2	2	Z	6
OGT211	Professional Practice Training-I	0	16	8	Z	8
	Elective	2	0	2	S	2
	Elective	2	0	2	S	2
	TOTAL	**15**	**19**	**28**		**30**
ELECTIVE COURSES (Two courses will be chosen from the following)						
OGT213	Thermodynamics	2	0	2	S	2
OGT215	Maintenance Fault and Repair	2	0	2	S	2
OGT217	Entrepreneurship	2	0	2	S	2

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2ND GRADE SPRING SEMESTER (IV. SEMESTER)

C.CODE	COURSE NAME	T	U	K	Z/S	ECTS
AİT210	Atatürk's Principles and Revolution History-II	2	0	2	Z	2
OGT204	Measurement and Control Techniques	3	0	3	Z	4
OGT206	Studies, Projects and Techniques	3	0	3	Z	3
OGT208	Computer Aided Drawing and Design	2	1	2	Z	4
OGT210	Plumbing	2	1	3	Z	3
OGT212	Occupational Health and Safety	2	0	2	Z	2
OGT214	Professional Practice Training-II	0	16	8	Z	8
	Elective	2	0	2	S	2
	Elective	2	0	2	S	2
	TOTAL	**18**	**18**	**27**		**30**
ELECTIVE COURSES (Two courses will be chosen from the following)						
OGT216	Pipeline Control and Inspection Methods	2	0	2	S	2
OGT218	Heating Systems	2	0	2	S	2
OGT220	Business Management	2	0	2	S	2

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ELECTRICAL AND ENERGY DEPARTMENT
NATURAL GAS AND INSTALLATION TECH. PR.
COURSE CONTENTS

1ST GRADE FALL SEMESTER

	T	U	K	S/Z	ECTS

TRD109 Turkish Language-I **2 0 2 Z 2**
Understanding that language is a product of the human mind, grasping the structural features and richness of the Turkish language, learning the ways to succeed in written expression, and developing research, reading, and information acquisition skills.

YDİ107 English Language-I **2 0 2 Z 2**
This course is designed to introduce students to the fundamental building blocks of the English language. The course covers a wide range of topics, including English sentence structure, tenses, moods, nouns, adjectives, and other essential grammar concepts.

MAT101 Mathematics-I **3 0 3 Z 4**
This course is designed to develop students' mathematical thinking skills and understanding of fundamental mathematical concepts. The course covers a wide range of topics, including sets, numbers, algebra, and functions.

OGT101 Technical Drawing **3 2 3 Z 4**
This course is designed to equip students with the skills to accurately and clearly represent the three-dimensional features of an object or structure on a two-dimensional plane. The course covers fundamental principles of technical drawing, including scaling, dimensioning, geometric constructions, projections and perspective.

OGT103 Fundamentals of Electricity-I **3 0 4 Z 4**
This course provides a solid foundation in basic electrical concepts and principles. Students will learn about atoms, electric charges, conductors, insulators, semiconductors, electric current, voltage, resistance, and Ohm's Law. They will also gain practical experience in building and testing simple electrical circuits, including series and parallel connections. Additionally, students will learn about safety measures such as grounding and short-circuit protection.

OGT105 Scientific Principles of Technology **3 0 3 Z 4**
Physical Quantities and Dimensional Analysis (Fundamental and Derived Quantities, Unit Systems, Unit Conversions), Scalar and Vector Quantities (Scalar quantities, Vector quantities, Vector components, Unit vectors, Vector operations), Statics (Forces, Mass, Volume, Density, Center of Mass, Equilibrium, Moment), Kinematics (Relationship between distance, speed, and time, Accelerated and unaccelerated motion, Graphical representation of motion, Orbital motion), Dynamics (Newton's First, Second, and Third Laws of Motion, Frictional Motion), Work, Power, and Energy (Definition of work, Kinetic and Potential Energy, Efficiency, Other types of energy), Electricity and Magnetism (Electric charges, Electrification, Coulomb's Law, Current, Potential, Ohm's Law, Resistance, Connection of resistors, Magnetization), Structure and Properties of Matter (Definitions, Oxidation, Brittleness, Elasticity, Expansion and Longitudinal Expansion), Pressure in Solids and Fluids

(Definitions, U-tube, Atmospheric pressure, Pressure gauges).

OGT107 Fundamentals of Plumbing-I 3 1 4 Z 5

Basic operations, measuring methods, threading, pipe cutting, reaming, electrofusion welding, proper use and maintenance of mechanical installation tools and equipment, pipe work, welding operations, measuring information and measuring devices.

OGT109 Basic Information Technologies 2 2 3 Z 2

Usage Internet and internet browser, e-mail management, news groups/forums, webbased learning, preparing a personal website, electronic commerce, CV in word processing program, internet and career, preparing for a job interview, spreadsheet, formulas and functions, graphics, preparing presentations, preparing introductory materials.

OGT111 Research Methods and Techniques 2 0 2 Z 3

Selection of research topics, conducting source research, evaluating research results, converting research results into a report, preparing for presentation and presentation.

1ST GRADE SPRING SEMESTER

T	U	K	S/Z	ECTS

TRD102 Turkish Language-II 2 0 2 Z 2

To be able to recognize the types of written expression in daily life, to understand the importance of punctuation in written expression, to understand the importance of correct expression in personal and social communication, to be able to apply research, reading and information skills.

YDİ102 English Language-II 2 0 2 Z 2

Tenses, present, present, past, future tenses, modals; might, could, can, must, may; adverbs, place, direction, purpose, adverbs of manner; adjectives, order of adjectives, comparison, structures indicating superlatives; passive voice, passive voice in present, present, present, past, future tenses, conditional clauses, adjective phrases, transfer sentences, verb structures, to, -ing, noun phrases, adverbial phrases, comparative structures.

MAT102 Mathematics-II 3 0 3 Z 4

Area and volume calculations with the help of integral, center of gravity calculations with the help of integral, differential equations, solutions of differential equations, error and types of error, solution of linear equation systems, curve fitting methods, interpolation techniques.

OGT102 Fundamentals of Plumbing-II 2 2 3 Z 5

Cutting sheets, riveting sheets, clamping sheets, centering sheets, soldering sheets, cutting steel pipes, threading steel pipes, tightening fittings, making surface-mounted installations, making concealed (built-in) installations, cutting pipes, reaming, opening sockets, countersinking, joining with unions, bending, joining with presses, preparing copper pipes for brazing and brazing, cutting plastic pipes and joining plastic pipes with fusion welding.

OGT104 Quality Assurance and Standards 3 0 3 Z 4

Concept of Quality, Standard and Standardization, Standard in production and service sectors importance, Management quality and standards, Environmental standards, Quality management system models, Selection of research topics, conducting source research, evaluating research results, converting research results into a report, preparing for presentation and presentation.

OGT106 Fundamentals of Electricity-II 3 0 3 Z 5

Static Electricity, current and voltage, resistance and its types, Ohm's Law, Power, Energy, Efficiency and electrical power sources, Kirchhoff's laws, series circuit and parallel circuit, solutions of series and parallel single source circuits, circuit solution methods, circuit theorems.

OGT108 Material Information 3 0 3 Z 4

To be able to understand the definition of material, the classification principles of materials and the basic properties of materials. To be able to interpret the tensile-strain diagram, to determine the material properties according to the important points in the tensile-strain diagram and to do the relevant experiments.

OGT110 Communication and Ethics 2 0 2 S 2

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

OGT112 Solar Energy and Applications 2 0 2 S 2

Solar energy systems, Heating and cooling systems powered by solar energy, Solar cells and batteries. Installation of solar energy systems in residential areas.

OGT114 Hydraulic and Pneumatic Systems 2 0 2 S 2

Principles of Hydraulic and Pneumatic, Hydraulic and Pneumatic Circuit elements, Hydraulic Circuit Design, Project drawing, Pneumatic Circuit Design, Project Drawing, Fault Detection and Repair in Hydraulic and Pneumatic Systems.

2ND GRADE FALL SEMESTER

T	U	K	S/Z	ECTS

AİT209 Atatürk's Principles and Revolution History-I 2 0 2 Z 2

The purpose of studying Atatürk's Principles and History of Revolution course and the concept of revolution, a collective look at the reasons that prepared the collapse of the Ottoman Empire and the Turkish Revolution; the disintegration of the Ottoman Empire, the Armistice of Mudros, the situation of the country against the occupations and Mustafa Kemal Pasha's arrival in Samsun, the first step for the national struggle, organization through congresses, Kuvayÿ Milliye and Misak-ÿ Milli, the opening of the Turkish Grand National Assembly, the Turkish Grand National Assembly taking over the administration of the War of Independence, the national struggle until the Sakarya Victory, the Sakarya War and the Great Offensive, from Mudanya to Lausanne, the national struggle in the fields of education and culture, the national struggle in the social and economic fields.

OGT203 Natural Gas Installation Application Principles 3 0 4 Z 4

Principles Natural gas project information, natural gas line grounding rules, tranche line and cathodic protection techniques, main cut-off valve, valves used in Natural Gas and Installation, building distribution line, natural gas supply line.

OGT205 Alternative Energy Sources 3 0 4 Z 3

Renewable energy sources and production systems. Renewable energy production systems design, main dimensions and production quantity calculations. Detailed information and feasibility studies on solar, wind, geothermal, hydraulic, biomass, biogas energy systems.

OGT205 Pipe Welding 3 1 4 Z 3

Oxy-acetylene welding, Basic principles of electricity, Basic laws of electricity, Welding with electrode ignition, Electric arc welding, Oxy-acetylene plane piece welding, Oxy-acetylene pipe welding, Electric-arc plane piece welding, Electric-arc pipe welding.

OGT209 Internship Evaluation 0 2 2 Z 6

Evaluation and presentation of the internship notebooks.

OGT211 Professional Practice Training-I 0 16 8 Z 8

The program includes 14 weeks of workplace training, 1 working day per week, in a relevant workplace. Introducing industrial areas, demonstrating production stages, observing working conditions of suitable companies, sharing work experiences, introducing industrial companies.

OGT213 Thermodynamics 2 0 2 S 2

Basic terms of thermodynamics, System, environment, phase change, Thermodynamic properties of pure substance, Ideal gas equation, Cycle, unit systems, Specific volume, density, pressure, PV, PT relations, Laws of thermodynamics, Zeroth law of thermodynamics (thermal equilibrium), First Law of Thermodynamics, Second Law of Thermodynamics, Work, power, efficiency expressions, Work in phase changes, PV diagrams, Work and heat concepts, work and heat transformations, Examination of Isochore Transformation Process, Examination of Isobaric Transformation Process, Examination of Isotherm Transformation Process, Examination of Adiabatic Transformation Process, Examination of Polytropic Transformation Process, Conduction Heat Transfer, Convection Heat Transfer, Radiation Heat Conduction.

OGT215 Maintenance Fault and Repair 2 0 2 S 2

Tools and equipment information, fluid information, material information, device information, natural gas network installation information, Natural Gas and Installation application regulations and specifications information, occupational health and safety measures information, workplace working procedures information, professional physics information, professional mathematics information, professional terminology information, problem solving ability, technical drawing information, device information, natural gas network installation information, Natural Gas and Installation application regulations and specifications information, workplace working procedures information.

OGT217 Entrepreneurship 2 0 2 S 2

The concept of entrepreneurship and its historical development, Characteristics of

entrepreneurship, Entrepreneurial decision-making process, Establishment process of small businesses, Small businesses and types of businesses, Selection of establishment location, Management, Marketing and Financing in small businesses, Preparation of business plan, Bankruptcy in businesses.

3RD GRADE SPRING SEMESTER

	T	U	K	S/Z	ECTS

AİT210 Atatürk's Principles and Revolution History-II 2 0 2 Z 2

The war of independence, the Sakarya war, the Great Offensive, Republicanism and the Caliphate from Mudanya to Lausanne, the period of calm and democracy, nationalism, the principle of secularism, Turkey's agenda.

OGT 204 Measurement and Control Techniques 3 0 3 Z 4

To be able to recognize the precision measuring and control instruments used in dimension and angle measurement. To be able to read the basic measuring instruments such as caliper, micrometer, comparator used in machinery. Design topic, package program installation, running the package program, data collection, data entry, analysis, program outputs. 0 16 8 Z 8 Introducing industrial areas, demonstrating production stages, observing working conditions of suitable companies, sharing work experiences, introducing industrial companies. To determine tolerances.

OGT 206 Survey, Projects and Techniques 3 0 3 Z 3

Investment and Project Concepts, Project Types, Agricultural Projects, Market study (competitive environment analysis, market size estimation and methods), Determination of Project/Scale size (capacity), technology selection, establishment location selection etc. decisions, financing of projects and financing sources, incomeexpenses of the project, cash flow analysis in the project, financial and economic evaluation of projects, preparation of surveying quantities on the project, collection of offers, approximate cost calculation, approximate cost calculation with unit prices.

OGT 208 Computer Aided Drawing and Design 2 1 2 Z 4

Design topic, package program installation, running the package program, data collection, data entry, analysis, program outputs.

OGT 210 Plumbing 2 1 3 Z 4

Basic information about clean water, taking water from the source, making water of different properties usable. Explanation and introduction of all systems used in sanitary installations, starting from the city clean water network to fire and rain systems, building sanitary systems and materials used in sanitary installations. General symbols used in installations and their meanings. Placement of sanitary installation materials in wet areas.

OGT 212 Occupational Health and Safety 2 0 3 Z 2

First aid training, first aid supplies, ensuring personal safety, ensuring employee safety, ensuring work environment safety.

OGT214 Professional Practice Training-II 0 16 8 Z 8

The program includes 14 weeks of workplace training, 1 working day per week, in a relevant workplace. Introducing industrial areas, demonstrating production stages, observing working conditions of suitable companies, sharing work experiences, introducing industrial companies.

OGT216 Pipeline Control and Inspection Methods 2 0 2 S 2

Classification of material testing methods. Penetrant liquid method. Magnetic particle testing. Infrared ray testing. Eddy current method. Ultrasonic testing. X and gamma ray testing. Some quality control standards related to the subject.

OGT218 Heating Systems 2 0 2 S 2

Heat loss calculation, Floor heating system device selection, Pipe selection, Heaters, Heater mounting apparatus, Heater installation, System commissioning, Floor heating boilers, Boiler installations, Chimney connection, Combi devices, Installation of combi devices, Combi chimney connection, Mobile Heating, Plastic sheathed pipe installation, Mobile installation heater installation, Testing the installation, System commissioning.

OGT220 Business Management 2 0 2 S 2

The aim of the course is to teach the basic concepts and objectives of business and business management, to determine their relationships with the environment, to classify businesses, to list the stages of establishing a business, to teach business functions, and to provide information on leadership and management.