**Firat University Elazig Organized Industrial Zone Vocational School**

**Department of Electronics and Automation Electronics Technology Program**

**(2017-2018 Curriculum) COURSE PROGRAM**

**1ST CLASS 1ST SEMESTER**

| D.KOD | DERS ADI | T | U | K | Z/M/S | AKTS |
|---|---|---|---|---|---|---|
| AIT101 | Ataturk's Principles and Revolution History-I | 2 | 0 | 2 | Z | 2 |
| TRD109 | Turkish Language-I | 2 | 0 | 2 | Z | 2 |
| YDI107 | Foreign Language-I | 2 | 0 | 2 | Z | 2 |
| MAT101 | Mathematics-I | 3 | 0 | 3 | Z | 4 |
| OET101 | Direct Current Circuit Analysis | 3 | 1 | 4 | Z | 6 |
| OET103 | Measurement Technique | 3 | 1 | 4 | Z | 5 |
| OET105 | Digital Electronics | 3 | 1 | 4 | Z | 5 |
| OET113 | Occupational Health and Safety | 2 | 0 | 2 | Z | 2 |
| | Elective Course | 2 | 0 | 2 | S | 2 |
| | **TOTAL** | **22** | **3** | **25** | | **30** |
| **ELECTIVE COURSES (One of the following courses will be chosen)** | | | | | | |
| OET107 | First Aid | 2 | 0 | 2 | S | 2 |
| OET109 | Professional Ethics | 2 | 0 | 2 | S | 2 |
| OET111 | Information and Communication Technology | 2 | 0 | 2 | S | 2 |

***Abbreviations:*** *T= Theoretical course hours; U= Practical course hours; K = Course Credit; Z = Compulsory course; M = Vocational course; S = Elective course; ECTS=European Credit Transfer System*

**1ST CLASS 2ND SEMESTER**

| D.KOD | DERS ADI | T | U | K | Z/M/S | AKTS |
|---|---|---|---|---|---|---|
| AIT102 | Ataturk's Principles and History of Revolution -I | 2 | 0 | 2 | Z | 2 |
| TRD110 | Turkish Language -II | 2 | 0 | 2 | Z | 2 |
| YDI108 | Foreign Language -II | 2 | 0 | 2 | Z | 2 |
| MAT102 | Mathematics-II | 3 | 0 | 3 | Z | 4 |
| OET104 | Alternating Current Circuit Analysis | 3 | 1 | 4 | Z | 4 |
| OET106 | Computer Aided Circuit Design | 2 | 1 | 3 | Z | 3 |
| OET108 | Electronics-I | 3 | 1 | 4 | Z | 4 |
| OET110 | Digital Design | 3 | 1 | 4 | Z | 4 |
| OET207 | Electrical Machines | 3 | 1 | 4 | Z | 3 |
| | Elective Course | 2 | 0 | 2 | S | 2 |
| | **TOTAL** | **25** | **5** | **30** | | **30** |
| **ELECTIVE COURSES (One of the following courses will be chosen)** | | | | | | |
| OET114 | Algorithm and Programming | 2 | 0 | 2 | S | 2 |
| OET116 | Communication | 2 | 0 | 2 | S | 2 |
| OET118 | Electronics Profession and Security | 2 | 0 | 2 | S | 2 |

***Explanation**: Z = Compulsory course, M = Vocational course, S = Elective course*

**2ND CLASS 1ST SEMESTER**

| D.KOD | DERS ADI | T | U | K | Z/M/S | AKTS |
|---|---|---|---|---|---|---|
| OET201 | Electronics-II | 3 | 1 | 4 | Z | 4 |
| OET203 | Power Electronics | 3 | 1 | 4 | Z | 4 |
| OET205 | Microcontrollers | 3 | 1 | 4 | Z | 3 |
| OET231 | Internship Evaluation | 0 | 2 | 1 | Z | 6 |
| OET232 | Professional Practice Education-I | 0 | 16 | 8 | Z | 8 |
| | Elective Course | 2 | 1 | 3 | S | 3 |
| | Elective Course | 2 | 0 | 2 | S | 2 |
| | **TOTAL** | **13** | **22** | **26** | | **30** |
| **ELECTIVE COURSES (Two courses will be chosen from the following)** | | | | | | |
| OET209 | Vocational Foreign Language | 2 | 0 | 2 | S | 2 |
| OET229 | Optical Electronics | 2 | 1 | 3 | S | 3 |
| OET211 | System Analysis and Design-I | 2 | 0 | 2 | S | 2 |
| OET215 | Control Circuits | 2 | 1 | 3 | S | 3 |

***Explanation**: Z = Compulsory course, M = Vocational course, S = Elective course*

**2ND CLASS 2ND SEMESTER**

| D.KOD | DERS ADI | T | U | K | Z/M/S | AKTS |
|---|---|---|---|---|---|---|
| OET202 | Fault Analysis | 2 | 1 | 3 | Z | 3 |
| OET204 | Programmable Controllers | 3 | 1 | 4 | Z | 4 |
| OET206 | Advanced Microcontrollers | 3 | 1 | 4 | Z | 4 |
| OET208 | Sensors and Transducers | 2 | 1 | 3 | Z | 3 |
| OET212 | Electronic Circuit Applications | 0 | 3 | 3 | Z | 3 |
| OET233 | Professional Application Training-II | 0 | 16 | 8 | Z | 8 |
| | Elective Course | 2 | 1 | 3 | S | 3 |
| | Elective Course | 2 | 0 | 2 | S | 2 |
| | **TOTAL** | **14** | **24** | **30** | | **30** |
| **ELECTIVE COURSES (Two courses will be chosen from the following)** | | | | | | |
| OET210 | System Analysis and Design-II | 2 | 0 | 2 | S | 2 |
| OET224 | Quality Assurance and Standards | 2 | 0 | 2 | S | 2 |
| OET220 | Radio TV Technology | 2 | 1 | 3 | S | 3 |
| OET223 | Computer Aided Drawing | 2 | 1 | 3 | S | 3 |

***Explanation**: Z = Compulsory course, M = Vocational course, S = Elective course*

**FIRAT UNIVERSITY**
**ELAZIG ORGANIZED INDUSTRIAL ZONE VOCATIONAL SCHOOL**
**ELECTRONIC TECHNOLOGY PROGRAM**
**COURSE CONTENTS (FOR THOSE WHO ENTERED IN 2018 AND LATER)**

| COURSE CODE-COURSE NAME | T | U | Class Hours | AKTS |
|---|---|---|---|---|
| **AIT101 - Ataturk's Principles and Revolution History I** | **2** | **0** | **2** | **2** |

The Purpose of Studying the Atatürk Principles and History of Revolution Course and the Concept of Revolution, a Collective Look at the Causes that Prepared the Fall 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, the National Forces and the National Pact, the Opening of the Grand National Assembly of Turkey, the Grand National Assembly of Turkey Taking Over the Management of the War of Independence, the National Struggle Until the Victory of Sakarya, the Battle of Sakarya and the Great Offensive, from Mudanya to Lausanne, the National Struggle in the Field of Education and Culture, the National Struggle in the Social and Economic Fields.

| | | | | |
|---|---|---|---|---|
| **TRD109 - Turkish Language I** | **2** | **0** | **2** | **2** |

To be able to comprehend that language is a product of the human mind, to comprehend the structural features and richness of the Turkish language, to comprehend the ways to be successful in written expression, to develop the skills of research, reading and information.

| | | | | |
|---|---|---|---|---|
| **YDI107 - Foreign language I** | **2** | **0** | **2** | **2** |

Determiners; Prepositions: Place, Time, Movement; Singular and Plural Nouns, Countable and Uncountable Nouns, Tenses, Present Tense, Present Tense, Past Tense Structures, Modals, Will, Should, Should Not, Must, Must Not, Can, Comparative Structures, Pronouns, Personal Pronouns, Possessive Pronouns, Adjectives, Positive Sentences, Negative Sentences and Questions, Conjunctions.

| | | | | |
|---|---|---|---|---|
| **MAT101 - General Mathematics** | **3** | **0** | **3** | **4** |

Numbers, Exponents and Radicals, Modular Arithmetic, Decimals, Algebra and Polynomials, Ratio and Proportion, Equations, Inequalities, Functions, Trigonometry, Vectors, Matrices.

| | | | | |
|---|---|---|---|---|
| **OET101 - Direct Current Circuit Analysis** | **3** | **1** | **4** | **6** |

Static Electricity, Precautions Against Unforeseen Effects of Electric Current, Circuit Solutions in Direct Current, Loop Current Method, Node Voltage Method, Source Connections, Thevenin's Theorem, Norton's Theorem, Superposition Theorem, Maximum Power Theorem, Storage Elements in Direct Current, Power and Energy in Direct Current.

| | | | | |
|---|---|---|---|---|
| **OET103 - Measurement Technique** | **3** | **1** | **4** | **5** |

Length, Area, Section and Diameter Measurement, Slope, Volume and Weight Measurement, Vector Measurement, Moment Measurement, Speed and Speed, Temperature, Light and Sound Measurement, Pressure and Stress, Fluid Measurement, Measurement and Measuring Instruments,

Measurement Errors, Units and Conversions, Resistance and Coil Measurement, Capacitor and RLC Measurement, Current and Voltage Measurement, Frequency Measurement and Oscilloscope, Instrument Transformers, Power and Energy Measurement.

**OET105 - Digital Electronics** **3 1 4 5**

Number Systems, Logical Gate Circuits, Boolean Mathematics, Karnough Map, Encoders, Decoders, Multiplexers, Demultiplexers, Adders, Adders-Subtractors, Subtractors-Comparators, Comparators.

**OET111 - Information and Communication Technology** **2 0 2 2**

Internet and Internet Browser, Electronic Mail Management, News Groups / Forums, Web-Based Learning, Personal Website Preparation, Electronic Commerce, CV in Word Processing Program, Internet and Career, Job Interview Preparation, Spreadsheet, Formulas and Functions, Graphs, Presentation Preparation, Introductory Material Preparation.

**OET113 – Occupational Health and Safety** **2 0 2 2**

First Aid Training, First Aid Supplies, Ensuring Personal Safety, Ensuring Employee Safety, Ensuring Workplace Safety

**AIT102 - Ataturk's Principles and Revolution History II** **2 0 2 2**

Struggle for Independence, Battle of Sakarya, Great Offensive, Republicanism and Caliphate from Mudanya to Lausanne, The Period of Maintenance of Tranquility and Democracy, Nationalism, The Principle of Secularism, Turkey's Agenda

**TRD110 - Turkish Language II** **2 0 2 2**

To be able to recognize the subject of written expression types 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.

**YDI108 - Foreign Language II** **2 0 2 2**

Tenses, Present Tense, Past Tense, Future Tense Structures, Modals, Might, Could, Can, Must, May; Adverbs, Place, Direction, Purpose, Adverbs of Manner; Adjectives, Order of Adjectives, Comparison, Superlative Structures; Passive Structure, Present, Aprient, Past, Future Tenses Passive Structure, Conditional Clauses, Adjective Clauses, Transference Clauses, Verb Structures, To, -Eng, Noun Clauses, Adverb Clauses, Comparative Structures.

**OET102 - Professional Mathematics** **3 0 3 4**

Definition of Complex Numbers, Vector Representation, Four Operations of Complex Numbers in Cartesian Form, Polar and Cartesian Transformations of Complex Numbers, Four Operations of Complex Numbers in Polar Form, Use of Complex Numbers in Professional Field, Properties and Operations of Exponential Functions, Definition of Logarithm Function and Methods of Taking Logarithms, Use of Logarithm Function in Professional Field, Definition of Derivative and Methods of Taking Derivative, Application of Derivative on Functions, Use of Derivative in Professional Field, Definition of Integral and Methods of Taking Integral, Application of Integral on Functions, Use of Derivative in Professional Field.

**OET104 - Alternating Current Circuit Analysis** **3 1 4 4**

Basic Definitions in Alternating Current, Behavior of R, L and C Elements in Alternating Current, Series R-L-C Circuits, Parallel R-L-C Circuits, Resonant Circuit, Solution Methods of Alternating Current Circuits, Power and Compensation in Alternating Current, Power and Energy in Single-Phase Alternating Current, Power and Energy in Three-Phase Alternating Current.

**OET106 – Computer Aided Circuit Design** **2 1 3 3**

Simulation of Basic Circuits, Simulation of Analog Circuits, Simulation of Digital Circuits, Introduction to Printed Circuit Program, Circuit Drawing in Program Environment, Creating Printed Circuit Diagram.

**OET108 - Electronic I** **3 1 4 4**

Semiconductor Materials, Structure and Types of Diodes, Rectifier Circuits, Definition and Types of Filters, Definition and Types of Regulators, Definition, Structure and Types of Transistors, Definition, Structure and Types of JFET, Use of JFET as a Switching and Amplifying Element. Definition, Structure and Types of MOSFET, Use of MOSFET as a Switching and Amplifying Element.

**OET110 - Digital Design** **3 1 4 4**

Multivibrators, Flip Flops, Circuit Design with Flip Flops, Asynchronous Counters, Synchronous Counters, Recorders, Analog to Digital Converters, Digital to Analog Converters.

**OET114 - Algorithm and Programming** **2 0 2 2**

Algorithm. Flowchart, Programming Tools, Variables and Constants, Input-Output Operations, Operators, Decision Structures, Loop Controls, One-Dimensional Arrays, Multi-Dimensional Arrays, Non-Value Returning Subroutines, Value Returning Subroutines.

**OET207 - Electrical Machines** **3 1 4 3**

Parts and Working Principles of Electrical Machines, Structure and Operation of D.A. Electrical Machines. Working Principles of Motor and Generator, Characteristics of Direct Current Machines, Speed Adjustment in Direct Current Machines, Parts and Working Principles of Three-Phase Asynchronous Motor, Starting Methods of Three-Phase Asynchronous Motor, Speed Adjustment Methods of Three-Phase Asynchronous Motors, Structures and Types of Single-Phase Asynchronous Motors, Types and Working Principles of Single-Phase Asynchronous Motors, Stepper Motors, Servo Motors, Working Principles of Motor and Generator of Synchronous Machines, Starting of Synchronous Motors, Load Adjustment, Phasor Diagram, Parallel Operation.

**OET201 - Electronic II** **3 1 4 4**

Using Transistor as Amplifier Element, Operational Amplifiers and Their Use as Inverting Amplifiers, Using Operational Amplifier as Non-Inverting Amplifier, Using Voltage Follower Amplifiers, Using Amplifiers with Summing Circuit, Using Operational Amplifier as Comparator, Using Operational Amplifier as Level Detector, Using Operational Amplifier as Filter, Using Transistor Oscillators, Using Oscillators with Operational Amplifiers.

**OET203 - Power Electronics** **3 1 4 4**

Thyristors, Thyristor Trigger Circuits, Triacs and Diacs, Mosfets, IGBTs, Single Phase Uncontrolled Rectifier Circuits, Single Phase Controlled Rectifier Circuits, Three Phase Uncontrolled Rectifier Circuits, Three Phase Controlled Rectifier Circuits, Single Phase AC Choppers, Three Phase AC Choppers, Buck and Boost Choppers, Current Fed Inverters, Voltage Fed Inverters, Direct Frequency Converters.

**OET205 - Microcontrollers** **3 1 4 3**

Microcontroller Architecture and Hardware, Loading Programs to Microcontrollers, Designing Algorithms, Flow Charts, Microcontroller Memory and Registers, Microcontroller Program Commands, Basic Input Output Programs, Program Compilation and Error Control, Button and

LED Applications with Microcontrollers, 7 Segment Display Applications with Microcontrollers, Keypad Applications with Microcontrollers, LCD Applications with Microcontrollers.

**OET211 - System Analysis and Design I** **2 0 2 2**

Choosing the Subject of Study. Presenting the Obtained Information, Defining the Functions and Variables of the System/Product, Selecting the Necessary Materials, Presenting the Obtained Information, Preparing the Specification or Flow Chart of the System/Product, Making the Program or Calculations of the System/Product, Establishing the Environment in Which the System/Product Will Work, Installing the System/Product, Testing the System/Product, Presenting the Outputs of the System/Product in the Form of a Report.

**OET231 – Internship Evaluation** **0 2 1 6**

Examining the internship notebooks prepared by the students, which include their work and experiences under the supervision of experts in workplaces (laboratory, workshop, factory, business, field, and other service areas) related to the basic professional knowledge they received in their programs, for a period of 6 weeks (30 working days), presentation before the jury, and evaluation of the presentations together with other internship documents.

**OET215 - Control Circuits** **2 1 3 3**

Control Elements, Protection Relays, Control Circuits, Starting Three-Phase Asynchronous Motors from Two Different Places (Remote), Starting Three-Phase Asynchronous Motors with Resistance, Starting Three-Phase Asynchronous Motors with Reactance and Auto Transformer, Star-Delta Starting Three-Phase Asynchronous Motors, Changing the Direction of Rotation in Three-Phase Asynchronous Motors, Braking in Three-Phase Asynchronous Motors, Single-Phase Asynchronous Motor Control Circuits, Changing the Direction of Rotation in Single-Phase Asynchronous Motors, Starting Asynchronous Motors with Wound Rotors.

**OET232 – Professional Practice Training -I** **0 16 8 8**

It includes 14 weeks of workplace training, one working day per week in the workplace related to Vocational Practice Training. Introduction to industrial areas, demonstration of production stages, observation of working conditions of suitable companies, sharing of work experiences, introduction of companies in the industry.

**OET223 - Computer Aided Drawing** **2 1 3 3**

Basic Drawing Methods, Drawing of a Given Object, Layers, Colors and Lines, Features of the Program, Dimensioning the Drawing Screen, Basic Drawing Commands, Basic Installation Drawing, Installation Drawing on Architectural Plan.

**OET202 - Fault Analysis** **2 1 3 3**

Fault Isolation, Finding the Faulty Unit or Element, Fault and Maintenance Card, Catalog, Archiving.

**OET204 - Programmable Controllers** **3 1 4 4**

Basic Technology of PLC, PLC Units, PLC Interface Program, PLC Programming, Sequential Function Blocks, PLC Program with Sequential Function Blocks, Touch Panels, Panel Programming.

**OET206 - Microcontroller Applications** **3 1 4 4**

Building ADC Circuits with Microcontrollers, Building Circuits with Microcontrollers and Switching Elements, Building Sensor Circuits with Microcontrollers, Building EEPROM Circuits with Microcontrollers, Building Serial Communication Circuits with Microcontrollers, Building Motor Control Circuits with Microcontrollers.

**OET208 - Sensors and Transducers** **2 1 3 3**

Temperature Sensors, Humidity Sensors, Speed Sensors, Vibration Sensors, Position Sensors, Proximity Sensors, Pressure Sensors, Flow Sensors, Level Sensors, Impact (Force) Sensors.

**OET210 - System Analysis and Design II** **2 0 2 2**

Choosing the Subject of Study, Presenting the Obtained Information, Defining the Functions and Variables of the System/Product, Selecting the Necessary Materials, Presenting the Obtained Information, Preparing the Specification or Flow Chart of the System/Product, Making the Program or Calculations of the System/Product, Establishing the Environment in Which the System/Product Will Work, Installing the System/Product, Testing the System/Product, Presenting the Outputs of the System/Product in the Form of a Report.

**OET220 - Radio TV Technology** **2 1 3 3**

Radio, Tape, MP3 Player Repair, Tube TV Repair, LCD, Plasma, Projector and LED TV Repair, VCD, DVD, Satellite Receiver and Video Camera Repair.

**OET212 Electronic Circuit Applications** **0 3 3 3**

Applications Related to Basic Electronic Circuit Elements, Rectifier Applications, Transistor Applications, Opamp Applications, Regulator Applications.

**OET233 Professional Practice Training -II** **0 16 8 8**

It includes 14 weeks of workplace training, one working day per week in the workplace related to Vocational Practice Training. Introduction to industrial areas, demonstration of production stages, observation of working conditions of suitable companies, sharing of work experiences, introduction of companies in the industry.