



VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL  
ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAM

# THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES

The Curriculum Framework

Ankara, 2021

## CONTENTS

INTRODUCTION .....	1
1.CURRICULUM DEVELOPMENT PROCESS IN VOCATIONAL AND TECHNICAL EDUCATION.....	1
2. THE CURRICULUM PERSPECTIVE .....	3
2.1 VALUES .....	3
2.2 COMPETENCIES.....	3
3. ASSESSMENT AND EVALUATION .....	5
4.CERTIFICATION .....	6
5. THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES .....	6
5.1. OBJECTIVES OF THE CURRICULUM.....	6
5.2. DURATION.....	9
5.3. REFERENCE DOCUMENTS AND BASES .....	9
5.4. ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS WEEKLY COURSE SCHEDULES.....	12
THE BRANCH OF ELEVATOR SYSTEMS WEEKLY COURSE SCHEDULE .....	12
THE BRANCH OF ELECTRICAL INSTALLATIONS AND DISTRIBUTION WEEKLY COURSE SCHEDULE.....	13
THE BRANCH OF ELECTRICAL APPLIANCES TECHNICAL SERVICE WEEKLY COURSE SCHEDULE.....	14
THE BRANCH OF ELECTRONICS AND COMMUNICATION WEEKLY COURSE SCHEDULE .....	15
THE BRANCH OF INDUSTRIAL MAINTENANCE AND REPAIR WEEKLY COURSE SCHEDULE.....	16
THE BRANCH OF DEFENSE ELECTRONIC SYSTEMS WEEKLY COURSE SCHEDULE ...	17
5.5. FRAMEWORK CURRICULUM IMPLEMENTATION PRINCIPLES.....	18
5.6. COMPULSORY ( * ) VOCATIONAL COURSES TABLE .....	20
6. COURSES .....	21
6.1. COMMON COURSES .....	21
6.2. VOCATIONAL COURSES .....	21
9TH GRADES VOCATIONAL COURSES AND OUTCOMES .....	21
BASIC ELECTRIC-ELECTRONICS WORKSHOP .....	21
10TH,11TH GRADES VOCATIONAL COURSES AND OUTCOMES.....	22
THE BRANCH OF ELEVATOR SYSTEMS .....	22
COMMAND TECHNIQUES WORKSHOP.....	22
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	24
COMPUTER AIDED CIRCUIT DESIGN .....	25
ELEVATOR ASSEMBLY WORKSHOP .....	25
ELEVATOR MAINTENANCE AND REPAIR.....	27
COMPUTER AIDED ELEVATOR DESIGN .....	28
THE BRANCH OF ELECTRICAL INSTALLATIONS AND DISTRIBUTION .....	29
INSTALLATIONS WORKSHOP.....	29
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	30
COMPUTER AIDED CIRCUIT DESIGN .....	31
BOARD WORKSHOP .....	32
ELECTRICAL INSTALLATION PROJECTS .....	34
CONTROL PANELS .....	35
THE BRANCH OF ELECTRICAL APPLIANCES TECHNICAL SERVICE .....	36
SMALL HOME APPLIANCES WORKSHOP .....	36
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	37
COMPUTER AIDED CIRCUIT DESIGN.....	38
HOME APPLIANCES WITH INSTALLATION WORKSHOP .....	39
REFRIGERATORS AND AIR CONDITIONERS.....	40
THE BRANCH OF ELECTRONICS AND COMMUNICATION .....	41
ELECTRONICS WORKSHOP .....	41
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	41
COMPUTER AIDED CIRCUIT DESIGN.....	42
MICROCONTROLLERS AND SAFETY WORKSHOP .....	43
VIDEO SYSTEMS.....	44
COMMUNICATION .....	45

THE BRANCH OF INDUSTRIAL MAINTENANCE AND REPAIR .....	46
COMMAND AND CONTROL WORKSHOP .....	46
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	48
COMPUTER AIDED CIRCUIT DESIGN.....	49
AUTOMATION WORKSHOP LESSON.....	50
INDUSTRIAL ELECTRONICS.....	51
MICROCONTROLLERS AND CODING.....	52
THE BRANCH OF DEFENSE ELECTRONIC SYSTEMS .....	52
ANALOGUE-DIGITAL ELECTRONICS WORKSHOP.....	52
THE PRINCIPLES OF ELECTRIC-ELECTRONICS.....	53
COMPUTER AIDED CIRCUIT DESIGN.....	54
DEFENSE ELECTRONICS WORKSHOP .....	55
CODING WITH MICROCONTROLLERS .....	56
TEST APPLICATIONS.....	57
6.3. ON-SITE VOCATIONAL TRAINING .....	57
6.4. ACADEMIC SUPPORT COURSES .....	57
6.5. ELECTIVE VOCATIONAL COURSES.....	58
6.5.1. THE TABLE OF CERTIFICATE COURSES.....	58
6.5.2. THE TABLE OF ELECTIVE VOCATIONAL COURSES.....	58
3D MODELING .....	59
AC MOTOR CONTROL AND WINDING TECHNIQUES.....	60
SMART HOME SYSTEMS .....	62
ELEVATOR FINAL CHECKS AND TESTS .....	63
PRINTING MACHINES.....	63
MULTIMEDIA SYSTEMS.....	64
DISTRIBUTION NETWORK AND TARIFFS.....	65
DC MOTOR WINDING TECHNIQUES.....	66
ELECTRIC-ELECTRONIC PROJECTS.....	67
INDUSTRIAL KITCHEN AND WASHERS.....	70
FAX MACHINES .....	71
ACCESS CONTROL SYSTEMS .....	71
GSM TELEPHONES.....	72
COMMUNICATION NETWORK INFRASTRUCTURES.....	72
HYDRAULIC AND PNEUMATIC SYSTEMS .....	73
ADVANCED MICROCONTROLLER APPLICATIONS .....	73
DRAWINGS OF PANEL PROJECTS .....	74
SOUND AND LIGHT SYSTEMS.....	75
BASIC ROBOTIC APPLICATIONS.....	76
TRANSFORMER WINDING .....	78
CASH TILLS AND BILL COUNTERS .....	78
PRINTERS .....	79
HV SYSTEMS.....	80
SWITCHING AND AUTOMATION IN HV INSTALLATIONS.....	82
ESCALATOR WALKWAY SYSTEMS.....	83
PROGRAMMING .....	84
DIGITAL DESIGN .....	84
SOCIAL MEDIA.....	85
6.6. ELECTIVE COURSES .....	86

## **INTRODUCTION**

The rapid changes in science and technology, the changing needs of the individual and society, innovations and improvements in learning teaching theories and approaches have also directly affected the roles expected from individuals. This change describes an individual with qualifications like generating information; being able to use it functionally in life, problem solving, critical thinking, entrepreneurial, decisive, having communication skills, being able to empathize, contributing to the society and culture. Acquiring a profession is prioritized in the expectations of individuals and societies from education. Vocational education, within the integrity of the National Education System, comprises planning, researching, improving and organizing all vocational and technical education services together with agriculture, industry and service sectors and activities of coordinated administration, supervision and teaching. The objective of these educational activities carried out within the scope of a certain plan and schedule included in the applications of Vocational and Technical Education is to raise qualified intermediate member power which is needed at all stages of production and to raise competent individuals that will ensure continuity of the society. While curriculums that will serve to raise individuals having this texture of qualification are prepared, a structure that pays regard to individual differences, aims for the value and skill acquisition and turns out to be comprehensible has been adopted rather than a structure that merely conveys information. In line with this purpose, on the one hand, the repetitive acquisitions and explanations at different subject and grade levels with a spiral approach, and on the other hand, the learning outcomes aimed to be achieved in a holistic and one-time manner were included. Outcomes and explanations in both groups are competent, up-to-date, valid and capable of being interrelated with life during the education and training period of the relevant discipline. These outcomes and their demarcating explanations refer to a plain content with an aspect of providing integrity in the perspective of competencies, skills and values at the level of grades and education degrees. Thus, a total of curriculums providing meaningful and permanent learning, durable and interrelated with previous learnings, integrated with other disciplines and daily life around values, skills and competencies has been constituted.

### **1.CURRICULUM DEVELOPMENT PROCESS IN VOCATIONAL AND TECHNICAL EDUCATION**

Vocational and technical education field curriculums are designed to prepare the individuals for the business life and based on the labor market needs and the approach of job analysis. In this approach, the profession profile is defined by analyzing the professions and the tasks/duties and processes assigned for the member of the profession are determined. On the one hand, while the curriculum aims to provide the students with the necessary knowledge, skills, manners and attitudes for fulfilling the relevant tasks and processes via courses and their outcomes; educational activities are planned in a way to prepare individuals for business life in accordance with this framework.

The developed curriculum is a detailed plan comprising the preparation, implementation and evaluation of the educational activities.

This plan is prepared in such a manner that

- It will raise members of profession meeting the requirements of the sector, having the national and international knowledge, skills and competencies.
- It will provide internal and vertical transfer opportunities for individuals at all proficiency levels.
- It will present the individuals convenient options in line with their differences and characteristics.

To that end, a curriculum approach based on the analysis of task and profession has been adopted in vocational and technical education.

The curriculum development process is made up of the stages below:

**Analysis** : Labor market needs analysis / skill needs analysis / training needs analysis / occupation analysis / national occupational standards

**Planning** : Specification of the curriculum approach and establishing a framework according to the approach

**Development** : Preparation of curriculum documents

**Implementation:** Approval and implementation of the curriculums

**Evaluation** : Monitoring, evaluation and updating of applications

Within this process, a commission has been established with the participation of labor market representatives, field teachers, specialist academicians in the field and representatives of civil society organizations to carry out the analysis, design and development stages. In the commission studies, the data from the European Qualifications Framework (EQF), the Turkish Qualifications Framework (TQF), international developments, the emerging developments in business life and professions, 3rd and 4th level of national occupational standards and national competencies, feedbacks from educational institutions and practitioners, international classifications and standards, educational policies, protocols, Research and Development (RD) reports, data from the Turkish Statistical Institute (TSI) and other institutions / associations have been referenced.

The curriculum frameworks prepared at the end of this process are based on the competencies of more than one profession within the framework of interdisciplinary curriculum perception. The vocational competencies generating the focus of the curriculum are separated into two units. These are “basic vocational skills” and “advanced or specific vocational skills” related to the profession. In vocational and technical education curriculums, it’s aimed to provide the students with the basic vocational skills by means of workshops, labs and vocational courses, and advanced or specific vocational skills through on-site vocational training and elective vocational courses.

By means of on-site vocational training, outcomes comprising the knowledge and skills required by the branch, necessitating the implementation and practicing of mainly the tasks, projects, experiments and the services are included.

Elective vocational courses aim to ensure the students adapt to the changes in science, industry and technology easily. These courses have been designed in a structure compatible with the properties of the school (students’ interests and needs, educational environments, etc) and with the regional needs of the sector.

## 2. THE CURRICULUM PERSPECTIVE

The basic objective of our education system is to raise individuals having knowledge, skills and behaviours integrated with our values and competencies. While knowledge, skills and behaviors are tried to be achieved through the curriculums, our values and competencies function as a horizon and a connection that provide integrity among these knowledge, skills and behaviours.

Our values are our own heritage from the national and spiritual resources of our society, which have reached today and will be transferred to our future. Competencies are our operational integrities that enable this heritage to participate and contribute to life and humanity.

### 2.1 VALUES

Current developments of our era are one of the reasons for the diversification in professions, trade and economy, even the most important one. The diversification in the labor market instruments, frequent use of virtual platforms have weakened face to face communication. This rapid change has revealed how important the human factor is in the work done and in the quality of the goods produced.

Raising members of professions who have national, spiritual, ethical and all humanistic values, stimulating cooperation and reliance between tradesmen and craftsmen; nascency of values like kindness, love, respect have become a social requirement. Professional associations, -Ahi Brotherhood community being in the first place- have regulated the cultural and social life of Turkish society as well as the professional life.

Professionals doing their job within the framework of moral principles always stand out from other colleagues. The Ahi Brotherhood culture is the supreme example of professional ethics in our history. The spread of values such as love, respect, solidarity, philanthropy, cooperation, justice, honesty and reliability, which are the building blocks of this culture, will bring dynamism to the business and commercial world.

### 2.2 COMPETENCIES

With the transition of societies from the technology age to the information age, the expectations of the society from the future members have also changed in the axis of scientific, technological, social changes and developments that have occurred in recent years. These developments and advancements necessitate providing the students with the competencies and skills such as cognitive ones like critical and original thinking, researching, problem solving; social ones like cultural and social participation, entrepreneurship, communication, developing empathy; personal ones like self-control, self-confidence, stability, leadership along with basic knowledge and skills.

As the skill ranges of the students, the competencies that will be needed in their personal, social, academic and business lives at a national and international level are defined in the Turkish Qualifications Framework (TQF). TQF defines eight key qualifications and describes them as follows:

**1) Communication in the native language:** Means the interpretation and expression of notions, thoughts, opinions and facts both verbally and in written (listening, speaking, reading and writing); having a linguistic interaction, convenient within all the social and cultural contexts like education and training, workplace, home and entertainment, so as to be able to generate new ideas.

**2) Communication in foreign languages:** Mostly, shares the basic skill aspects of communication in native language and is based on the skills of interpretation, expression and comprehension of the feelings, thoughts, notions, facts and opinions both verbally and in written within a range of convenient social and cultural contexts like education, training, workplace, home and entertainment according to the requests and needs of the person. Communication in foreign languages also requires the skills of mediation and intercultural understanding. Competency level of the individual will vary between different languages with the aspects of listening, speaking, reading and writing depending on the individual's social and cultural background, environment, needs and interests.

**3) Mathematical competence and basic competencies in science/technology:** Mathematical competence is the improvement and implementation of mathematical thinking style to solve a range of problems encountered in daily life. The processes, activities and knowledge built on a steady arithmetical skill are emphasized. Mathematical competence includes the ability and willingness to use mathematical modes of thinking (logical and spatial thinking) and presenting (formulas, models, constructs, graphs and tables) to varying degrees. Competence in science refers to the ability and willingness to utilize methodology and the existence of the knowledge to explain the natural world in order to define questions and produce evidence-based results. Competence in technology is considered as the application of the methodology and knowledge within the context of meeting the perceived human wants and needs. Competence in science and technology involves understanding of the changes resulting from human activities and the responsibilities of each individual as a citizen.

**4) Digital competence:** Involves the safe and critical use of information communication technologies for business, daily life and communication. This competence is supported by means of basic skills such as access to information and the use of computers for the evaluation, storage, production, presentation and exchange of information, as well as engaging in common networks and communicating via the Internet.

**5) Learning to learn:** It is the ability to pursue and insist on learning so that the individual can organize his / her learning action individually or as a group in such a way to involve the effective time and information management. This competence involves the individual's awareness of learning needs and processes through recognizing the existing potentials and the ability of the individual to deal with challenges for a successful learning action. It means seeking for counselling support and making use of it as well as gaining new knowledge and skills, processing and adapting them to oneself. Learning to learn motivates learners to rely on previous learning and life experiences to use and apply the knowledge and skills in various contexts such as home, workplace, education and training environment.

**6) Social and citizenship competencies:** These competencies include the personal, interpersonal and intercultural competencies; involve all courses of action enabling individuals to participate in diversifying society and working life effectively and constructively; providing them to be equipped with the qualifications to resolve conflicts when needed. Citizenship competence equips individuals to fully participate in civic life based on knowledge of social and political concepts and structures, and a commitment to democratic and active participation.

**7) Taking initiative and entrepreneurship:** States the ability of individuals to turn their thoughts into action. It also includes the ability to plan and manage projects to achieve goals besides innovative thinking and taking risks. This competence supports everyone not only at home and in the

community, but also in business life so that they can be aware of the context and conditions of their work and seize job opportunities; it also provides a basis for the more specific knowledge and skills needed by people who engage in or contribute to social and commercial activities. It also includes awareness of ethical values and supporting good governance.

**8) Cultural awareness and expression:** It is an appreciation of the importance of expressing opinions, experiences and feelings more productively using a variety of mass media, including music, performing arts, literature and visual arts.

### **3. ASSESSMENT AND EVALUATION**

Assessment is defined as the representation of the observations after surveying a quality, with numbers or other symbols; and evaluation is the process of concluding by comparing the assessment results with a standard. Assessment and evaluation practices defining the extent to which the knowledge, skills and attitudes specified in the curriculum outcomes are achieved have an important place in making the education effective and successful in the education-training process. Assessment and evaluation practices enable the specification and correction of deficient learnings and the conducting of effective guidance in the process with feedback. It is essential for the assessment instruments to be used in education to have sufficiently high validity and reliability and objectively reveal whether the students have learned the intended behaviours to be taught to them and the levels of competency and determination they have reached in these behaviours. Traditional and performance-based evaluation approaches should evenly take part in the curriculums of vocational and technical education institutions. Traditional assessment, also called result-based assessment, is predominantly used to measure acquisitions based on cognitive skills. Assessment instruments in traditional approach consist of true/false, matching, gap filling, short-answer, open ended and multiple-choice question types. Type of the question to be used is determined depending on the cognitive-skill level of the curriculum outcomes. Performance-based assessment, on the other hand, includes practices and tasks that will enable students to transfer their knowledge and skills to real life, taking into account their individual differences. Evaluation doesn't depend on a certain time in this approach in which students are expected to create a product or perform a task including more than one skill, it is carried out throughout the process. Individuals are expected to transform the knowledge they obtained into skills by putting them into practice in vocational and technical education where psychomotor skills requiring mind-muscle coordination are predominant. On the purpose of assessing the process and the product that they present by integrating their knowledge and skills, students are asked to perform a task or an operation by means of experiments, projects, practices, etc. and the results obtained are evaluated in accordance with predetermined criteria. In order to make a performance-based evaluation, it is required to evaluate and score the performances of the students for the assigned performance-tasks with the appropriate one of check-list, rating scale, rubric, etc., consisting of previously prepared criteria. Students can be ensured to take part in the training process with the improvement of their critical thinking skills by using self-assessment and peer- assessment forms along with these evaluation approaches. While preparing assessment instruments, manners and behaviours needed for the skill should also be taken into consideration; a holistic structure appropriate for observing the cognitive, affective and psychomotor features as a whole should be constituted.



As diversity in education is influenced by the dynamics such as the individual, course content, social surroundings, school potentials, etc., the role of the education practitioners is considerably important in providing the efficiency of assessment and evaluation applications. The curriculum doesn't set certain limitations for the practitioners in terms of assessment instruments and methods that can be used in the assessment process, it only guides. However, necessary technical and academic standards should be observed within the preferred assessment and evaluation instrument and method.

#### **4.CERTIFICATION**

The graduate student is given a diploma showing his / her field and branch, and a business license, as well as a certificate of the relevant professions that can be accessed through elective vocational courses. Along with an additional Europass certificate/diploma including the information of the basic competencies gained through training period within the scope of Turkish Qualifications Framework; a document representing the name of the business in which the student had his/her traineeship or on-site vocational training, the name of the learning unit taken and accomplished; is arranged for the requestor graduates of vocational and technical secondary education programs.

### **5. THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES**

#### **5.1. OBJECTIVES OF THE CURRICULUM**

The Industry of electric-electronics is in a constant and dynamic change due to rapidly evolving market and rivalry conditions in a global scale. As a result of this fact, since it carries strategic values, the industry of electric-electronics is quite attractive to the countries, and several states carry out specific plans for this sector. Especially competitiveness in this sector gains more and more importance along with globalization, therefore industrialized countries carry out special politics in order to protect this sector and enhance competitiveness.

The Curriculum Framework of the Field of Electric-Electronic Technologies involves the branches of:

1. Elevator Systems,
2. Electric Installations and Distribution,
3. Electrical Appliances Technical Service,
4. Electronics and Communication,
5. Industrial Maintenance and Repair,
6. Defense Electronic Systems

Therefore, a formal education curriculum was developed in compliance with the national and international standards of the field of Electric and Electronic Technologies and the professions within the scope of the field.

Students who accomplish this program will be able to:

- develop skills that provide vocational development on the subjects of "job ethics and ahi community, occupational health and safety, technological advances and industrial

transformation, protecting the environment, enterprising ideas, business establishing and administration, intellectual and industrial property rights” within the context of the new age skills and design thinking approach.

- It is aimed to provide the students with the necessary knowledge, skills and qualifications related to carrying out basic electric-electronic, measurement and basic mechanical applications in compliance with the technique.

Besides the common knowledge, skills and qualifications related to these objectives, students also will be able to;

**In the Branch of Elevator Systems;**

- install the control circuits of electrical machines under the occupational health and safety measures,
- carry out electric-electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- carry out elevator installations under the occupational health and safety measures,
- carry out the repair and maintenance of the elevator under the occupational health and safety measures,
- carry out computer aided drawings, illumination designs and computer aided elevator designs under the occupational health safety measures,

**In the Branch of Electrical Installations and Distribution;**

- implement electrical installations in compliance with the Regulation of Interior Electrical Installations, under the occupational health and safety measures,
- carry out electric-electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- design the power and control panels of electrical installations in compliance with the Regulation of Interior Electrical Installations, the Regulation of Electric Powered Current Installations, and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures,
- design electrical installation projects on computer aided drawing software with the help of the Regulation of Interior Installations and the information gathered from the catalogues of manufacturing firms, under the occupational health and safety measures,
- design the control panels in compliance with the Regulation of Interior Electrical Installations, the Regulation of Electric Powered Current Installations, and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures,

**In the Branch of Electrical Appliances Technical Service;**

- carry out the maintenance and repair of household electrical appliances and design electrical control circuits under the occupational health and safety measures,
- carry out electric-electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- carry out the installation, repair and maintenance of the household electrical appliances under the occupational health and safety measures,
- carry out the installation, repair and maintenance of the refrigerators and air conditioning systems under the occupational health and safety measures,

**In the Branch of Electronics and Communication;**

- design various electronic circuits under the occupational health and safety measures,
- carry out electric-electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- design microcontroller and safety circuits, and encode them under the occupational health and safety measures,
- carry out the installation, repair and maintenance of the imaging devices under the occupational health and safety measures,
- design communication installation circuits under the occupational health and safety measures,

**In the Branch of Industrial Maintenance and Repair;**

- set up control circuits and hydraulic-pneumatic circuits related to electric machines and industrial electric systems in compliance with the Regulation of Electric Power Current Facilities, under the occupational health and safety measures,
- carry out electric-electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- carry out PLC and automation applications in compliance with the Regulation of Electric Power Current Facilities and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures,
- design various industrial electronic circuits under the occupational health and safety measures,
- design microcontroller circuits, and encode them under the occupational health and safety measures,

### **In the Branch of Defense Electronic Systems;**

- design analogue and digital electronic circuits under the occupational health and safety measures,
- carry out electric- electronic circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures,
- draw electronic circuits, design their simulations and draw printed circuits on computer aided simulation software under the occupational health and safety measures,
- carry out cabling, electronic card installation, and electro-mechanic installation under the occupational health and safety measures,
- carry out encoding via microcontroller under the occupational health and safety measures,
- carry out test applications under the occupational health and safety measures

### **5.2. DURATION**

Total duration of the field program has been planned as 4 years.

### **5.3. REFERENCE DOCUMENTS AND BASES**

While the program was being prepared, the below-listed reference documents and bases were taken into consideration along with the educational legislation and reflected in the components of the curriculum.

- ISCED-F classification
- Labor Law Number 4857
- Social Security and General Health Insurance Law Number 5510
- Occupational Health and Safety Law Number 6331
- Elevator Maintenance and Operation Regulations
- The Regulation on Fire Protection of Buildings
- The Regulation of Interior Electrical Installations
- The Regulation on the Duties and Responsibilities of Scientists on Electrical Matters
- The Regulation of Electric Power Current Facilities
- The Regulation of Electricity Market Tariffs
- Electric Facility Approval Regulations
- Electric Facility Project Regulations
- Electric Facility Groundings Regulations
- Electromagnetic Compatibility Regulations (2014/30/AB)
- Machine Safety Regulations (2006/42/AT)
- The Regulation of Occupational Health and Safety Risk Assessment
- The Regulation on Emergencies in Workplaces
- The Regulation on Health and Safety Measures to be taken in work place structures and their extensions
- The Regulation on the usage of Personal Protective Equipment in Workplaces

- Machine Guarding Regulations
- The Regulation of Health and Safety Signs
- TEİAŞ Occupational Health and Safety Regulations
- Electro-Mechanic Assembly Worker 4th Level National Occupational Standard published on the Official Gazette dated 01.12.2010 with the repeating number of 27772
- Electric Distribution Network Operation and Maintenance Personnel 4th Level National Occupational Standard published on the Official Gazette dated 03.10.2013 with the repeating number of 28784
- Relay Personnel 4th Level National Occupational Standard published on the Official Gazette dated 03.10.2013 with the repeating number of 28784
- 4th Level National Occupational Standard of Electricians published on the Official Gazette dated 20.03.2014 with the repeating number of 28947
- Electrical and Electronic Appliances Technical Service Personnel 4th Level National Occupational Standard published on the Official Gazette dated 20.03.2014 with the repeating number of 28947
- Electricity Meter Installation and Uninstallation Personnel 4th Level National Occupational Standard published on the Official Gazette dated 06.06.2014 with the repeating number of 29022
- 4th Level National Occupational Standard of Coil Winding Personnel published on the Official Gazette dated 14.08.2014 with the repeating number of 29088
- 4th Level National Occupational Standard of Transformer Coil Winding Personnel published on the Official Gazette dated 14.08.2014 with the repeating number of 29088
- 4th Level National Occupational Standard of Plant Electric Maintenance Personnel published on the Official Gazette dated 25.01.2015 with the repeating number of 29247
- Electric Distribution Network Line Maintenance Personnel 4th Level National Occupational Standard published on the Official Gazette dated 26.05.2015 with the repeating number of 29367
- Electric Distribution Network Leakage and Measurement Check Personnel 4th Level National Occupational Standard published on the Official Gazette dated 26.05.2015 with the repeating number of 29367
- Electric Distribution Network Test Personnel 4th Level National Occupational Standard published on the Official Gazette dated 26.05.2015 with the repeating number of 29367
- Audio and Video Systems Personnel 4th Level National Occupational Standard published on the Official Gazette dated 25.10.2016 with the repeating number of 29868
- Telecommunication Maintenance and Repair Personnel 4th Level National Occupational Standard published on the Official Gazette dated 20.12.2017 with the repeating number of 30276
- Telecommunication Energy Systems Personnel 4th Level National Occupational Standard published on the Official Gazette dated 20.12.2017 with the repeating number of 30276

- Telecommunication Earth Station Facility and Management Personnel 4th Level National Occupational Standard published on the Official Gazette dated 20.12.2017 with the repeating number of 30276
- Telecommunication Operation and Management Personnel 4th Level National Occupational Standard published on the Official Gazette dated 15.03.2018 with the repeating number of 30361
- Telecommunication Network Installation Personnel 4th Level National Occupational Standard published on the Official Gazette dated 15.03.2018 with the repeating number of 30361
- Telecommunication Network Planning Field Personnel 4th Level National Occupational Standard published on the Official Gazette dated 15.03.2018 with the repeating number of 30361
- Elevator Maintenance and Repair Personnel 4th Level National Occupational Standard published on the Official Gazette dated 06.12.2018 with the repeating number of 30617
- 4th Level National Occupational Standard of Elevator Assemblers published on the Official Gazette dated 06.12.2018 with the repeating number of 30617
- 4th Level National Occupational Standard of Electric Panel Assemblers published on the Official Gazette dated 06.12.2018 with the repeating number of 30617
- Automation Systems Installation Personnel 4th Level National Occupational Standard published on the Official Gazette dated 06.12.2018 with the repeating number of 30617
- 4th Level National Occupational Standard of High Voltage Cable Accessory Assemblers published on the Official Gazette dated 06.12.2018 with the repeating number of 30617
- High Voltage Equipment Test Personnel 4th Level National Occupational Standard published on the Official Gazette dated 06.12.2018 with the repeating number of 30617

#### 5.4. ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS WEEKLY COURSE SCHEDULES

##### VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES (THE BRANCH OF ELEVATOR SYSTEMS) WEEKLY COURSE SCHEDULE

COURSE CATEGORIES	COURSES	9th GRADE	10th GRADE	11th GRADE	12th GRADE	
					AVP	ATP
COMMON COURSES	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5	
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2	
	HISTORY	2	2	2	-	
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2	
	GEOGRAPHY	2	2	-	-	
	MATHEMATICS	6	5	-	-	
	PHYSICS	2	2	-	-	
	CHEMISTRY	2	2	-	-	
	BIOLOGY	2	2	-	-	
	PHILOSOPHY	-	2	2	-	
	FOREIGN LANGUAGE	5	2	2	2	
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-	
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-	
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>	
VOCATIONAL COURSES	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	-	Academic Support Courses
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-		
	COMMAND TECHNIQUES WORKSHOP (*)	-	9	-		
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-		
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-		
	ELEVATOR ASSEMBLY WORKSHOP	-	-	9		
	ELEVATOR MAINTENANCE AND REPAIR	-	-	4		
	COMPUTER AIDED ELEVATOR DESIGN	-	-	4		
	ON-SITE VOCATIONAL TRAINING (*)	-	-	-	24	
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>	-	-	-	-	<b>31</b>	
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>24</b>	-	
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>	-	-	9	<b>7</b>	-	
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>	<b>2</b>	-		-		
	-	<b>1</b>	<b>1</b>	<b>1</b>		
<b>TOTAL HOURS OF THE COURSES</b>	<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>		

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.

**VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL**  
**ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS**  
**THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES**  
**(THE BRANCH OF ELECTRICAL INSTALLATIONS AND DISTRIBUTION)**  
**WEEKLY COURSE SCHEDULE**

COURSE CATEGORIES	COURSES	9th GRADE	10th GRADE	11th GRADE	12th GRADE	
					AVP	ATP
COMMON COURSES	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5	
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2	
	HISTORY	2	2	2	-	
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2	
	GEOGRAPHY	2	2	-	-	
	MATHEMATICS	6	5	-	-	
	PHYSICS	2	2	-	-	
	CHEMISTRY	2	2	-	-	
	BIOLOGY	2	2	-	-	
	PHILOSOPHY	-	2	2	-	
	FOREIGN LANGUAGE	5	2	2	2	
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-	
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-	
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>	
VOCATIONAL COURSES	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	-	Academic Support Courses
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-		
	INSTALLATIONS WORKSHOP (*)	-	9	-		
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-		
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-		
	PANELS WORKSHOP (*)	-	-	9		
	ELECTRICAL INSTALLATION PROJECTS	-	-	4		
	CONTROL PANELS	-	-	4		
ON-SITE VOCATIONAL TRAINING (*)	-	-	-	24		
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>		-	-	-	-	<b>31</b>
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>		<b>11</b>	<b>14</b>	<b>17</b>	<b>24</b>	-
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>		-	-	9	7	-
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>		2	-		-	
<b>GUIDANCE AND ORIENTATION</b>		-	1	1	1	
<b>TOTAL HOURS OF THE COURSES</b>		<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>	

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.



**VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL**  
**ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS**  
**THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES**  
**(THE BRANCH OF ELECTRICAL APPLIANCES TECHNICAL SERVICE)**  
**WEEKLY COURSE SCHEDULE**

COURSE CATEGORIES	COURSES	9th GRADE	10th GRADE	11th GRADE	12th GRADE	
					AVP	ATP
COMMON COURSES	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5	
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2	
	HISTORY	2	2	2	-	
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2	
	GEOGRAPHY	2	2	-	-	
	MATHEMATICS	6	5	-	-	
	PHYSICS	2	2	-	-	
	CHEMISTRY	2	2	-	-	
	BIOLOGY	2	2	-	-	
	PHILOSOPHY	-	2	2	-	
	FOREIGN LANGUAGE	5	2	2	2	
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-	
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-	
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>	
VOCATIONAL COURSES	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	-	Academic Support Courses
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-		
	SMALL HOME APPLIANCES WORKSHOP(*)	-	9	-		
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-		
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-		
	HOME APPLIANCES WITH INSTALLATION WORKSHOP	-	-	9		
	COOLERS AND AIR CONDITIONERS	-	-	8		
	ON-SITE VOCATIONAL TRAINING (*)	-	-	-	24	
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>		-	-	-	-	<b>31</b>
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>		<b>11</b>	<b>14</b>	<b>17</b>	<b>24</b>	-
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>		-	-	<b>9</b>	<b>7</b>	-
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>		<b>2</b>	-		-	
<b>GUIDANCE AND ORIENTATION</b>		-	<b>1</b>	<b>1</b>	<b>1</b>	
<b>TOTAL HOURS OF THE COURSES</b>		<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>	

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.

**VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL  
ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS  
THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES  
(THE BRANCH OF ELECTRONICS AND COMMUNICATION)  
WEEKLY COURSE SCHEDULE**

COURSE CATEGORIES	COURSES	9th GRADE	10th GRADE	11th GRADE	12th GRADE	
					AVP	ATP
COMMON COURSES	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5	
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2	
	HISTORY	2	2	2	-	
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2	
	GEOGRAPHY	2	2	-	-	
	MATHEMATICS	6	5	-	-	
	PHYSICS	2	2	-	-	
	CHEMISTRY	2	2	-	-	
	BIOLOGY	2	2	-	-	
	PHILOSOPHY	-	2	2	-	
	FOREIGN LANGUAGE	5	2	2	2	
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-	
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-	
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>	
VOCATIONAL COURSES	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	-	Academic Support Courses
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-		
	ELECTRONICS WORKSHOP (*)	-	9	-		
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-		
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-		
	MICROCONTROLLERS AND SAFETY WORKSHOP (*)	-	-	9		
	VIDEO SYSTEMS	-	-	4		
	COMMUNICATION	-	-	4		
	ON-SITE VOCATIONAL TRAINING (*)	-	-	-	24	
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>	-	-	-	-	<b>31</b>	
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>24</b>	<b>-</b>	
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>	-	-	<b>9</b>	<b>7</b>	<b>-</b>	
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>	<b>2</b>	-			<b>-</b>	
<b>GUIDANCE AND ORIENTATION</b>	-	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	
<b>TOTAL HOURS OF THE COURSES</b>	<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>	

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.

**VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL**  
**ANATOLIAN VOCATIONAL AND ANATOLIAN TECHNICAL PROGRAMS**  
**THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES**  
**(THE BRANCH OF INDUSTRIAL MAINTENANCE AND REPAIR)**  
**WEEKLY COURSE SCHEDULE**

COURSE CATEGORIES	COURSES	9th GRADE	10th GRADE	11th GRADE	12th GRADE	
					AVP	ATP
COMMON COURSES	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5	
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2	
	HISTORY	2	2	2	-	
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2	
	GEOGRAPHY	2	2	-	-	
	MATHEMATICS	6	5	-	-	
	PHYSICS	2	2	-	-	
	CHEMISTRY	2	2	-	-	
	BIOLOGY	2	2	-	-	
	PHILOSOPHY	-	2	2	-	
	FOREIGN LANGUAGE	5	2	2	2	
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-	
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-	
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>	
VOCATIONAL COURSES	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	-	Academic Support Courses
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-		
	COMMAND AND CONTROL WORKSHOP (*)	-	9	-		
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-		
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-		
	AUTOMATION WORKSHOP (*)	-	-	9		
	INDUSTRIAL ELECTRONICS	-	-	4		
	MICROCONTROLLERS AND CODING	-	-	4		
	ON-SITE VOCATIONAL TRAINING (*)	-	-	-	24	
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>	-	-	-	-	<b>31</b>	
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>	<b>11</b>	<b>14</b>	<b>17</b>	<b>24</b>	-	
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>	-	-	<b>9</b>	<b>7</b>	-	
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>	<b>2</b>	-		-		
<b>GUIDANCE AND ORIENTATION</b>	-	<b>1</b>	<b>1</b>	<b>1</b>		
<b>TOTAL HOURS OF THE COURSES</b>		<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>	

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.

**VOCATIONAL AND TECHNICAL ANATOLIAN HIGH SCHOOL**  
**ANATOLIAN TECHNICAL PROGRAM**  
**THE FIELD OF ELECTRIC-ELECTRONIC TECHNOLOGIES**  
**(THE BRANCH OF DEFENSE ELECTRONIC SYSTEMS)**  
**WEEKLY COURSE SCHEDULE**

<b>COURSE CATEGORIES</b>	<b>COURSES</b>	<b>9th GRADE</b>	<b>10th GRADE</b>	<b>11th GRADE</b>	<b>12th GRADE</b>
<b>COMMON COURSES</b>	TURKISH LANGUAGE AND LITERATURE (*)	5	5	5	5
	RELIGIOUS CULTURE AND MORAL KNOWLEDGE	2	2	2	2
	HISTORY	2	2	2	-
	TR. REVOLUTION HISTORY AND KEMALISM	-	-	-	2
	GEOGRAPHY	2	2	-	-
	MATHEMATICS	6	5	-	-
	PHYSICS	2	2	-	-
	CHEMISTRY	2	2	-	-
	BIOLOGY	2	2	-	-
	PHILOSOPHY	-	2	2	-
	FOREIGN LANGUAGE	5	2	2	2
	PHYSICAL EDUCATION AND SPORTS/ VISUAL ARTS/ MUSIC	2	2	2	-
	HEALTH KNOWLEDGE AND TRAFFIC EDUCATION	-	-	1	-
<b>TOTAL</b>		<b>30</b>	<b>28</b>	<b>16</b>	<b>11</b>
<b>VOCATIONAL COURSES</b>	VOCATIONAL DEVELOPMENT WORKSHOP	2	-	-	<b>Academic Support Courses</b>
	BASIC ELECTRIC-ELECTRONICS WORKSHOP (*)	9	-	-	
	ANALOGUE-DIGITAL ELECTRONICS WORKSHOP (*)	-	9	-	
	THE PRINCIPLES OF ELECTRIC-ELECTRONICS	-	3	-	
	COMPUTER AIDED CIRCUIT DESIGN	-	2	-	
	DEFENSE ELECTRONICS WORKSHOP (*)	-	-	9	
	CODING WITH MICROCONTROLLERS	-	-	3	
	TEST APPLICATIONS	-	-	5	
<b>TOTAL HOURS OF ACADEMIC SUPPORT COURSES</b>		<b>-</b>	<b>-</b>	<b>-</b>	<b>31</b>
<b>TOTAL HOURS OF VOCATIONAL COURSES</b>		<b>11</b>	<b>14</b>	<b>17</b>	<b>-</b>
<b>TOTAL HOURS OF ELECTIVE VOCATIONAL COURSES(**)</b>		<b>-</b>	<b>-</b>	<b>9</b>	<b>-</b>
<b>TOTAL HOURS OF ELECTIVE COURSES(**)</b>		<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>GUIDANCE AND ORIENTATION</b>		<b>-</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>TOTAL HOURS OF THE COURSES</b>		<b>43</b>	<b>43</b>	<b>43</b>	<b>43</b>

**NOTES:**

(\*) Courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.

(\*\*) Explanations related to elective vocational courses and elective courses are given in the Implementation Principles of the Framework Curriculum.

## 5.5. FRAMEWORK CURRICULUM IMPLEMENTATION PRINCIPLES

1. The Curriculum has been designed as a 4-year program. Common courses, vocational courses, elective courses and academic Support Courses are listed on the weekly schedule.
2. There are courses which cover basic vocational skills of the field on the 9th grade; there are courses which cover vocational skills of the branch on the 10th and 11th grade. On the 12th grade, academic Support Courses are implemented on Anatolian Technical Program; on-site Vocational Training and elective vocational courses are implemented on Anatolian Vocational Program.
3. Branch education is pursued by taking into consideration local and sectoral needs, the status of the equipment and supplies, teachers and physical capacity of the schools and the needs and interests of the students.
4. The students who register with national exam scores graduate from Anatolian Technical Program by accomplishing academic Support Courses; or on their demand, graduate from Anatolian Vocational Program by accomplishing elective vocational courses and on-site vocational training.
5. The students who register to Anatolian Vocational Program according to their secondary education registration region can apply for a transfer to Anatolian Technical Program provided that they meet the requirements in compliance with the legislation related to the subject.
6. The Branch courses in 11<sup>th</sup> grade will be held at school in case there are no workplaces that are convenient education units for the practice in accordance with the relevant legislation.
7. The students who enroll in Anatolian Vocational Program continue on-site vocational training along with the elective vocational courses on the 12th grade.
8. The students who enroll in Anatolian Technical Program choose one of the course schedules given within the academic Support Courses on the 12th grade. The courses on the tables are based on The Journal of Notices of the board of education and the curricula that are already being implemented.
9. Weekly courses are planned without affecting the integrity of the hours of the courses given on the weekly courses schedule or they are planned respectively if possible.
10. The courses amongst vocational courses that are marked with (\*) are the compulsory courses of the field and the branch. These are the courses which cannot be regarded as achieved with year-end grade point average according to the Regulation on Secondary Education Institutions of the Ministry of National Education.
11. The elective courses of the 9th grade are to be selected from the table of elective courses according to the decisions published on the journal of notices of the board of education.
12. The elective courses and elective vocational courses in the 11th grade are planned as 9 hours of lessons in total. These courses are to be selected from the table of elective courses, from the table of elective vocational courses, among the vocational courses of the field/branch or among the vocational courses of the other field/branch according to the decisions of the board of education published on the journal of notices.

13. The students of Anatolian Vocational Program are to select 7 hours of courses from the table of elective courses which are in the framework curriculum on the 12th grade.
14. It is possible to get more than one certificate on the field and on the branch with the elective vocational courses.
15. The duration of learning unit of each course is determined by the board of the branch teachers without changing the duration of the course hours specified on the weekly courses schedule of vocational courses.
16. While planning the vocational courses, mainly the framework curriculum is to be utilized; the course information forms are also to be utilized.
  - a. The subjects (content) on the course information forms, objective remarks and application activity/practicing are to be utilized in order to provide the objectives of the vocational courses that are in the framework curriculum.
  - b. The application activities/ practices on the course information form are chosen by the board of branch teachers by considering the physical capacity and equipment of the school and the number of the students in order to accomplish the maximum amount of application activity/practice in compliance with the course objectives. Different application activities/practices can also be carried out.
17. The content of the on-site Vocational Training courses is developed by the board of branch teachers within the scope of the learning objectives of each branch which cover all of the knowledge and skills required for the branch, and which require mainly occupation, project, experiment and service implementation and practice.
18. The apprenticeship is carried out in order to have students adapt into the real production and service environment and the business life by getting to know the facilities and equipment that are not available in their schools; and also to have the students develop their vocational knowledge, skills, attitude and behaviors. The content of the apprenticeship program is developed by the board of branch teachers providing that it enables the practice, work, project, experiment and service to be implemented by considering the objectives of the related class/classes.
19. It is required that occupational health and safety measures are taken while pursuing Course Objectives and the learning unit. The measures that are required to be taken in compliance with the occupational health and safety legislations noted on the reference documents are listed on the course information forms by taking the specifications of the field and branches into consideration. Therefore, in order to raise individuals who are always aware of the necessary knowledge and skills of occupational health and safety, the subjects related to occupational health and safety measures on the course information forms and curriculum framework are discussed on the board of branch teachers.

## 5.6. COMPULSORY ( \* ) VOCATIONAL COURSES TABLE

Branches	GR ADE	Anatolian Vocational Program	Anatolian Technical Program
<b>Elevator Systems</b>	<b>9</b>	Basic Electric-Electronics Workshop	Basic Electric-Electronics Workshop
	<b>10</b>	Command Techniques Workshop	Command Techniques Workshop
	<b>11</b>	Elevator Assembly Workshop	Elevator Assembly Workshop
	<b>12</b>	On-site Vocational Training	-
<b>Electric Installations and Distribution</b>	<b>9</b>	Basic Electric-Electronics Workshop	Basic Electric-Electronics Workshop
	<b>10</b>	Installations Workshop	Installations Workshop
	<b>11</b>	Panels Workshop	Panels Workshop
	<b>12</b>	On-site Vocational Training	-
<b>Electrical Appliances Technical Service</b>	<b>9</b>	Basic Electric-Electronics Workshop	Basic Electric-Electronics Workshop
	<b>10</b>	Small Home Appliances Workshop	Small Home Appliances Workshop
	<b>11</b>	Home Appliances With Installation Workshop	Home Appliances With Installation Workshop
	<b>12</b>	On-site Vocational Training	-
<b>Electronics and Communication</b>	<b>9</b>	Basic Electric-Electronics Workshop	Basic Electric-Electronics Workshop
	<b>10</b>	Electronics Workshop	Electronics Workshop
	<b>11</b>	Microcontrollers and Safety Workshop	Microcontrollers and Safety Workshop
	<b>12</b>	On-site Vocational Training	-
<b>Industrial Maintenance and Repair</b>	<b>9</b>	Basic Electric-Electronics Workshop	Basic Electric-Electronics Workshop
	<b>10</b>	Command and Control Workshop	Command and Control Workshop
	<b>11</b>	Automation Workshop	Automation Workshop
	<b>12</b>	On-site Vocational Training	-
<b>Defense Electronic Systems</b>	<b>9</b>	-	Basic Electric-Electronics Workshop
	<b>10</b>	-	Analogue-Digital Electronics Workshop
	<b>11</b>	-	Defense Electronics Workshop
	<b>12</b>	-	-

## 6. COURSES

### 6.1. COMMON COURSES

Common Courses are the courses which every student takes until the end of the secondary education; provide common general knowledge at a minimum level; aim to give the awareness and the strength of being responsive to the problems of society by contributing to the financial, social and cultural development of the country; and prepare the student for higher education programs.

In the common courses listed on the weekly course schedule, the courses, the course hours and curriculum which are determined by the board of education are implemented.

### 6.2. VOCATIONAL COURSES

Vocational Courses are the courses which guide the students to the higher education programs and/or the job and business fields they aim at, and enable the students develop themselves for this purpose.

### 9TH GRADES VOCATIONAL COURSES AND OUTCOMES

#### BASIC ELECTRIC-ELECTRONICS WORKSHOP

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics, measurement and basic mechanic applications in compliance with standards and technical codes under the occupational health and safety measures.

**Grade** :9

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Measurement Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to implement OHS rules in the workshop.</li> <li>2. Students will be able to measure the length.</li> <li>3. Students will be able to carry out the diameter measurement and section calculation.</li> <li>4. Students will be able to measure speed and rpm.</li> <li>5. Students will be able to measure light intensity.</li> <li>6. Students will be able to measure sound intensity.</li> <li>7. Students will be able to measure the temperature.</li> <li>8. Students will be able to form basic electric circuit.</li> <li>9. Students will be able to measure the current on the electric circuit.</li> <li>10. Students will be able to measure the voltage on the electric circuit.</li> <li>11. Students will be able to measure the work and the power on the electric circuit.</li> <li>12. Students will be able to measure the frequency on the electric circuit.</li> </ol>
<b>Learning Unit</b>	<b>Electric Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to make conductive couplings.</li> <li>2. Students will be able to draw the low tension current installation circuits.</li> <li>3. Students will be able to make the low tension current installation circuits.</li> <li>4. Students will be able to draw the high tension current installation circuits.</li> <li>5. Students will be able to make the high tension installation circuits.</li> </ol>



<b>Learning Unit</b>	<b>Basic Mechanic Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to define the protective equipment used in mechanic workshop.</li> <li>2. Students will be able to carry out measurement and cutting processes.</li> <li>3. Students will be able to carry out drilling and screwing processes.</li> <li>4. Students will be able to carry out filing processes.</li> </ol>
<b>Learning Unit</b>	<b>Electronic Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the measurement and coupling of resistors.</li> <li>2. Students will be able to carry out the measurement and coupling of condensers.</li> <li>3. Students will be able to carry out the measurement and coupling of coils.</li> <li>4. Students will be able to carry out the measurement and circuit applications of diodes.</li> <li>5. Students will be able to carry out the measurement and circuit applications of transistors.</li> <li>6. Students will be able to carry out the measurement of current and voltage on electronic circuits.</li> <li>7. Students will be able to carry out brazing applications.</li> <li>8. Students will be able to carry out electronic circuit drawings.</li> <li>9. Students will be able to obtain printed circuit pattern.</li> <li>10. Students will be able to obtain printed circuit plate.</li> <li>11. Students will be able to carry out measurements with oscilloscope.</li> <li>12. Students will be able to carry out circuit smoothing and filtering applications.</li> <li>13. Students will be able to carry out regulated circuit applications.</li> <li>14. Students will be able to make voltage multipliers.</li> <li>15. Students will be able to build and install power supply circuit.</li> <li>16. Students will be able to perform power supply tests.</li> </ol>

## 10TH,11TH GRADES VOCATIONAL COURSES AND OUTCOMES

### THE BRANCH OF ELEVATOR SYSTEMS

#### COMMAND TECHNIQUES WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building command circuits of electrical machines under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Industrial Sensors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of industrial sensors.</li> <li>2. Students will be able to carry out circuit applications with digital output sensors.</li> <li>3. Students will be able to carry out circuit applications with analog output sensors.</li> <li>4. Students will be able to carry out circuit applications with signal converter.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motor Command Techniques</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to define command circuit elements.</li> <li>2. Students will be able to draw command and power circuit symbols.</li> <li>3. Students will be able to draw command and power circuits.</li> <li>4. Students will be able to build command and power circuits.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motors Starting Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the development and effects of asynchronous motors.</li> <li>2. Students will be able to carry out the applications of starting asynchronous motors.</li> <li>3. Students will be able to carry out the rpm adjustments with AC motor drivers.</li> <li>4. Students will be able to carry out the starting application of two-cycle asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Braking in Asynchronous Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of braking system.</li> <li>2. Students will be able to install padded brake systems in three-phase asynchronous motors.</li> <li>3. Students will be able to install dynamic brake systems in three-phase asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Electric Control Panel and Its Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the preparation for the installation of control panel.</li> <li>2. Students will be able to install the elements of control panel.</li> <li>3. Students will be able to carry out the cabling of control panel.</li> <li>4. Students will be able to carry out the tests of control panel.</li> </ol>
<b>Learning Unit</b>	<b>Basic PLC Processes</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of PLC.</li> <li>2. Students will be able to choose the input elements of PLC.</li> <li>3. Students will be able to choose the output elements of PLC.</li> <li>4. Students will be able to make the input and output connections of PLC.</li> <li>5. Students will be able to select the hardware and equipment of PLC.</li> </ol>
<b>Learning Unit</b>	<b>PLC Coding Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the logic of PLC coding and software languages.</li> <li>2. Students will be able to carry out basic editor processes on PLC software.</li> </ol>
<b>Learning Unit</b>	<b>Frequency Inverters</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of frequency inverters.</li> <li>2. Students will be able to carry out the connections and adjustments of frequency Inverters.</li> <li>3. Students will be able to check frequency inverters via PLC.</li> </ol>
<b>Learning Unit</b>	<b>Starting Synchronous Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of synchronous motors.</li> <li>2. Students will be able to carry out the connections of synchronous motors.</li> <li>3. Students will be able to carry out the applications of starting synchronous motors .</li> </ol>

## THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## COMPUTER AIDED CIRCUIT DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

## ELEVATOR ASSEMBLY WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing elevator assembly under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Workshop and Occupational Safety</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain personal protective equipment.</li> <li>2. Students will be able to explain the safety equipment utilized in the workshop.</li> <li>3. Students will be able to explain whether the equipment are safe and they are used in proper places.</li> <li>4. Students will be able to explain the operating safety and operating rules in assembly workshop.</li> <li>5. Students will be able to explain the types of accidents which may happen during elevator assembly.</li> </ol>
<b>Learning Unit</b>	<b>Mechanical Assembly Elements</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain detachable materials.</li> <li>2. Students will be able to explain non-detachable materials.</li> </ol>
<b>Learning Unit</b>	<b>Gears and Bearings</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain cams and pulleys according to their technical specifications.</li> <li>2. Students will be able to explain gears according to their technical specifications.</li> </ol>

<b>Learning Unit</b>	<b>Elevator Assembly Preparations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to check the equipment and materials before elevator assembly.</li> <li>2. Students will be able to perform the mechanical and electrical checks of the engine room before elevator assembly.</li> <li>3. Students will be able to check the elevator shaft and its interiors before elevator assembly.</li> <li>4. Students will be able to carry out the installation and check of the scaffold to be used for elevator assembly.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Guide Rails</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install plump bob.</li> <li>2. Students will be able to install wall brackets.</li> <li>3. Students will be able to assemble elevator cabin and counterweight rails.</li> <li>4. Students will be able to assemble brackets, guide rails and flanges.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Landing Doors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to mount the elevator landing door plump bob.</li> <li>2. Students will be able to install wall brackets of landing doors.</li> <li>3. Students will be able to install the frames of landing doors.</li> <li>4. Students will be able to install the components of landing doors.</li> <li>5. Students will be able to assemble the door leaves and frames of elevator.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Drive System</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to open holes for ropes and perform necessary checks.</li> <li>2. Students will be able to mount the engine, the diverting pulley and the engine stand.</li> <li>3. Students will be able to assemble the hydraulic unit and pistons.</li> <li>4. Students will be able to mount the elevator machine, the engine group and the brake system.</li> <li>5. Students will be able to assemble hydraulic drive system.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Cabin, Cabin Gate and Counterweight</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assemble the elevator cabin carrier frame in accordance with the dimensions.</li> <li>2. Students will be able to assemble the counterweight carrier frame and the weight stack in accordance with the dimensions.</li> <li>3. Students will be able to mount the rope.</li> <li>4. Students will be able to assemble the elevator cabin.</li> <li>5. Students will be able to assemble the elevator cabin carrier frame.</li> <li>6. Students will be able to install the components of cabin gates.</li> <li>7. Students will be able to mount the door leaves of cabin gates and check them.</li> <li>8. Students will be able to determine the fixation points of elevator suspension cables and install them.</li> <li>9. Students will be able to assemble the cabin gate.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Speed Regulator</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of speed regulator and its usage areas.</li> <li>2. Students will be able to explain the place of speed regulator and rope holes.</li> <li>3. Students will be able to explain the features of the upper side of speed regulator and the tension pulley.</li> <li>4. Students will be able to explain the features of cabin brake system (parachute) and regulator rope.</li> <li>5. Students will be able to mount the speed regulator.</li> </ol>

	6. Students will be able to carry out the maintenance and repair of the upper and sub sections of speed regulator.
<b>Learning Unit</b>	<b>Elevator Pit Bottom Elements</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assemble elevator cabin and counterweight buffers.</li> <li>2. Students will be able to mount counterweight separators.</li> <li>3. Students will be able to install pit bottom ladders.</li> <li>4. Students will be able to install balance chain and the pit bottom components of balance chain.</li> <li>5. Students will be able to carry out the maintenance and repair of elevator balance chain pit bottom components.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Control System Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install the control panel and revision set.</li> <li>2. Students will be able to mount the buttons of cabin and floors.</li> <li>3. Students will be able to carry out the installation of the elevator shaft equipment and electric couplings.</li> <li>4. Students will be able to mount the electrical safety elements (button, safety breaker and switches etc.).</li> <li>5. Students will be able to make the electric couplings of cabin installations control panel and revision set.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Post-Assembly Operations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the necessary maintenance and repair for post-assembly operations.</li> <li>2. Students will be able to carry out necessary checks by supplying power to elevator.</li> <li>3. Students will be able to check the safety systems for the operation of elevator.</li> <li>4. Students will be able to make inverter adjustments which are necessary for the operation of elevator.</li> <li>5. Students will be able to make floor adjustments which are required for the operation of the elevator (with usage speed).</li> <li>6. Students will be able to explain the engagement of hydraulic elevators with examples.</li> </ol>

## ELEVATOR MAINTENANCE AND REPAIR

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the maintenance and repair of elevators under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Preparations of Elevator Maintenance and Repair</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the systems of elevators.</li> <li>2. Students will be able to classify electric drive elevators.</li> <li>3. Students will be able to classify hydraulic drive elevators.</li> <li>4. Students will be able to utilize personal protective equipment before maintenance.</li> <li>5. Students will be able to obtain the materials to be used before elevator maintenance and check their soundness.</li> <li>6. Students will be able to procure the tools to be used and check their convenience.</li> <li>7. Students will be able to hang the informative warning signs of the building and install safety tape during the maintenance.</li> </ol>

	<ol style="list-style-type: none"> <li>8. Students will be able to check the elevator shaft bottom.</li> <li>9. Students will be able to carry out the general convenience check of the engine room before the maintenance.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Maintenance and Repair Operations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the maintenance of machine engine group.</li> <li>2. Students will be able to carry out the maintenance of engine and unit in hydraulic elevators.</li> <li>3. Students will be able to carry out the maintenance of the speed regulator.</li> <li>4. Students will be able to check the functionality of control panel and perform its maintenance.</li> <li>5. Students will be able to carry out the above-cabin maintenance under safety measures.</li> <li>6. Students will be able to perform the maintenance of landing doors.</li> <li>7. Students will be able to perform the maintenance of elevator gates.</li> <li>8. Students will be able to perform the maintenance of cabin tray.</li> <li>9. Students will be able to perform the maintenance of shaft bottom materials.</li> </ol>
<b>Learning Unit</b>	<b>The Operations after Elevator Maintenance and Repair</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to fill maintenance check form.</li> <li>2. Students will be able to remove the informative signs of the building.</li> <li>3. Students will be able to carry out the transportation of the wastes to the safe zone.</li> <li>4. Students will be able to sort the changed materials.</li> <li>5. Students will be able to carry out the maintenance and cleaning of the tools and materials used during the maintenance.</li> </ol>

## COMPUTER AIDED ELEVATOR DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out computer aided drawings, performing illumination designs and computer aided elevator designs under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Computer Aided Drawing (CAD)</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use computer aided drawing software.</li> <li>2. Students will be able to carry out the adjustments of computer aided drawing software and perform the drawings.</li> <li>3. Students will be able to perform various drawings on computer aided drawing software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Drawings of Electric-Electronic Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform various drawings of electric circuits on computer aided drawing software.</li> <li>2. Students will be able to perform various drawings of electric circuits on computer aided drawing software.</li> <li>3. Students will be able to perform various project drawings on computer aided drawing software.</li> </ol>
<b>Learning Unit</b>	<b>Illumination Simulation</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install illumination Simulation software and luminaire files of armatures.</li> <li>2. Students will be able to use the illumination Simulation software.</li> <li>3. Students will be able to perform various applications on illumination Simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Design Software</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare elevator preliminary and application projects.</li> <li>2. Students will be able to explain the components required for elevator design.</li> <li>3. Students will be able to explain the editors and compilers of elevator design software.</li> <li>4. Students will be able to carry out interface applications via visual coding on elevator design software.</li> <li>5. Students will be able to utilize basic coding commands on elevator design software.</li> <li>6. Students will be able to carry out elevator applications on elevator design software.</li> <li>7. Students will be able to carry out various port adjustments and checks on elevator design software.</li> </ol>

## THE BRANCH OF ELECTRICAL INSTALLATIONS AND DISTRIBUTION

### INSTALLATIONS WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building electrical installations in compliance with the Regulation of Interior Electrical Installations under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Grounding and Lightning Rod Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain grounding and its significance.</li> <li>2. Students will be able to build foundation grounding.</li> <li>3. Students will be able to make the connections of equipotential bus bar.</li> <li>4. Students will be able to install grounding column lines.</li> <li>5. Students will be able to install the grounding of distribution panel and boards.</li> <li>6. Students will be able to install the grounding of machines and electrical appliances.</li> <li>7. Students will be able to measure the grounding and resistivity of electrical installation.</li> <li>8. Students will be able to carry out the installation and connections of the lightning rod systems of buildings.</li> </ol>
<b>Learning Unit</b>	<b>Pipe, Canal and Carrier Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build surface mounted installations.</li> <li>2. Students will be able to build underfloor installations.</li> <li>3. Students will be able to build flush mounted installations.</li> </ol>
<b>Learning Unit</b>	<b>Busbar Systems</b>



<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the equipment to be used for busbar systems assembly.</li> <li>2. Students will be able to mount busbar line.</li> <li>3. Students will be able to make the module connections of busbar line.</li> </ol>
<b>Learning Unit</b>	<b>Telephone and Antenna Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install the telephone installation wires and mount the plug socket and terminal box.</li> <li>2. Students will be able to install the antenna installation cables and mount the plug socket and the antenna.</li> </ol>
<b>Learning Unit</b>	<b>Smart Home Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the hardware selection of smart home installations and design the project.</li> <li>2. Students will be able to carry out the installation and build connections of the smart home system elements.</li> <li>3. Students will be able to encode smart home systems and startup the systems.</li> </ol>
<b>Learning Unit</b>	<b>Power Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to make connections of three-phase plug and socket.</li> <li>2. Students will be able to make connections of three-phase combination boards.</li> <li>3. Students will be able to make connections of three-phase boards.</li> </ol>
<b>Learning Unit</b>	<b>Outdoor Lighting</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain street lighting equipment and their features.</li> <li>2. Students will be able to carry out the installation and connections of the street lighting luminaries.</li> </ol>

## THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## COMPUTER AIDED CIRCUIT DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

## BOARD WORKSHOP

**Course Objectives** : The aim of this course is to provide students the knowledge and skills related to designing the power and control panels of electrical installations in compliance with the Regulation of Interior Electrical Installations, the Regulation of Electric Powered Current Installations, and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Preparing the Panel for Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw the sketches of interior layout and connections of panels.</li> <li>2. Students will be able to install interior channels and rails of the panel.</li> <li>3. Students will be able to install interior supporting connection elements of the panel.</li> <li>4. Students will be able to install signal lamps.</li> <li>5. Students will be able to install residual current device and circuit breakers.</li> </ol>
<b>Learning Unit</b>	<b>Interior Connections of Panel</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the labeling of the interior and exterior of panels.</li> <li>2. Students will be able to crimp cable lug and ferrules and perform numbering.</li> <li>3. Students will be able to connect the cables to the devices.</li> <li>4. Students will be able to arrange the cables with cable tie and spiral.</li> </ol>
<b>Learning Unit</b>	<b>Command Circuit Elements</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the structure of asynchronous motor and the label information.</li> <li>2. Students will be able to carry out the electric terminal connections of asynchronous motors.</li> <li>3. Students will be able to carry out the selection and connection of contactors.</li> <li>4. Students will be able to build the connections of overcurrent relay.</li> <li>5. Students will be able to install the connections of time relay.</li> <li>6. Students will be able to make the connections of protection relay.</li> <li>7. Students will be able to make the connections of cam switches.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motor Command Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to define command circuit elements.</li> <li>2. Students will be able to draw command and power circuit symbols.</li> <li>3. Students will be able to draw command and power circuits.</li> <li>4. Students will be able to build command and power circuits.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motors Starting Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the development and effects of asynchronous motors.</li> <li>2. Students will be able to carry out the applications of starting asynchronous motors.</li> <li>3. Students will be able to carry out the rpm adjustments with AC motor drivers.</li> <li>4. Students will be able to carry out the starting application of two-cycle asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Braking in Asynchronous Motors</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of braking system.</li> <li>2. Students will be able to install padded brake systems in three-phase asynchronous motors.</li> <li>3. Students will be able to install dynamic brake systems in three-phase asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Industrial Electricity Meters and Their Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to read meter indexes.</li> <li>2. Students will be able to assess the meter indexes.</li> <li>3. Students will be able to mount three-phase electrometers.</li> <li>4. Students will be able to make connections of three-phase direct combined electrometer.</li> <li>5. Students will be able to explain the structure and the types of current and voltage transformers.</li> <li>6. Students will be able to explain the points to pay attention while connection, maintaining and repairing current and voltage transformers.</li> <li>7. Students will be able to perform the selection, installation and connection of current and voltage transformers.</li> <li>8. Students will be able to perform trouble shooting in current and voltage transformers.</li> <li>9. Students will be able to make connections of X5 combined electrometer.</li> </ol>
<b>Learning Unit</b>	<b>Distribution Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw the sketches of interior layout and connections of distribution panels.</li> <li>2. Students will be able to carry out the selection of the materials of distribution panels.</li> <li>3. Students will be able to install the post insulator and busbars of distribution panels.</li> <li>4. Students will be able to install the interior channels and rails of the panel.</li> <li>5. Students will be able to install moulded case circuit breakers.</li> <li>6. Students will be able to install residual current relay with fire protection threshold, and column circuit breakers.</li> <li>7. Students will be able to perform the installation and connection of surge arrestor and surge arrestor circuit breakers.</li> <li>8. Students will be able to carry out the cabling of the interior of distribution panels.</li> <li>9. Students will be able to perform the installation and connection of signal lamps.</li> </ol>
<b>Learning Unit</b>	<b>Compensation Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the calculations of compensation system.</li> <li>2. Students will be able to select the materials of compensation Panels.</li> <li>3. Students will be able to install the post insulator and busbars of compensation panels.</li> <li>4. Students will be able to carry out the installation and build connections of the condenser stage elements.</li> <li>5. Students will be able to build the reactor connections on compensation panels with reactor.</li> <li>6. Students will be able to perform the installation, connection and adjustments of reactive power control relay and current transformers.</li> <li>7. Students will be able to estimate the penalty rate of the system via Combi electricity meter indexes.</li> <li>8. Students will be able to perform the ventilation and illumination of compensation panels.</li> </ol>
<b>Learning Unit</b>	<b>Panel Tests</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the insulation test of the panel.</li> <li>2. Students will be able to carry out necessary test by supplying the required power for the panel.</li> </ol>
<b>Learning Unit</b>	<b>Startup of Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to fix the panel on the floor/wall.</li> <li>2. Students will be able to make the input and output cable connections of panels.</li> <li>3. Students will be able to build the grounding connection of the panel.</li> <li>4. Students will be able to fill the trouble card and the maintenance card of the panel.</li> <li>5. Students will be able to archive the panel production information equipment list.</li> </ol>

## ELECTRICAL INSTALLATION PROJECTS

**Course Objectives** : The aim of this lesson is to provide students the knowledge and skills related to designing electrical installation projects on computer aided drawing software with the help of the Regulation of Interior Installations and the information gathered from the catalogues of manufacturing firms, under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Computer Aided Drawing (CAD)</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use computer aided drawing software.</li> <li>2. Students will be able to carry out the adjustments of computer aided drawing software and perform the drawings.</li> <li>3. Students will be able to perform various drawings on computer aided drawing software.</li> </ol>
<b>Learning Unit</b>	<b>Lighting System</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to study the effects of lighting.</li> <li>2. Students will be able to explain the features of luminaries and lamps.</li> <li>3. Students will be able to carry out the lighting calculations of electrical installation project.</li> </ol>
<b>Learning Unit</b>	<b>Illumination Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install illumination Simulation software and luminaire files of armatures.</li> <li>2. Students will be able to use the illumination Simulation software.</li> <li>3. Students will be able to perform various applications on illumination Simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Installation Projects</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw building heavy current electric interior installation projects on computer aided drawing software.</li> <li>2. Students will be able to draw power installation projects on computer aided drawing software.</li> <li>3. Students will be able to draw weak current installation projects on computer aided drawing software.</li> <li>4. Students will be able to draw exterior lighting installation projects on computer aided drawing software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided HV Systems Single Line Projects</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain HV installation project symbols and their meanings.</li> <li>2. Students will be able to draw HV installation single line schemes.</li> <li>3. Students will be able to draw post type current transformer installation single line schemes.</li> <li>4. Students will be able to draw displaced projects.</li> </ol>
--------------------------	--

## CONTROL PANELS

**Course Objectives** : The aim of this course is to provide students the knowledge and skills related to designing the control panels of electrical installations in compliance with the Regulation of Interior Electrical Installations, the Regulation of Electric Powered Current Installations, and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Industrial Sensors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features, types and variations of industrial sensors.</li> <li>2. Students will be able to build circuits with digital output sensor.</li> <li>3. Students will be able to build circuits with analog output sensor.</li> <li>4. Students will be able to build circuits with signal converter.</li> </ol>
<b>Learning Unit</b>	<b>Panels with Process Control</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare special type controller and control relay panels.</li> <li>2. Students will be able to perform the pump check with fluid level relay.</li> <li>3. Students will be able to perform the heating system check with temperature control device.</li> </ol>
<b>Learning Unit</b>	<b>Panels with PLC Control</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of PLC.</li> <li>2. Students will be able to draw PLC diagrams.</li> <li>3. Students will be able to make the power source and power supply connections of PLC.</li> <li>4. Students will be able to make the connections of input and output elements of PLC.</li> <li>5. Students will be able to install the connections of digital and analog module and input output elements to PLC.</li> <li>6. Students will be able to install the software on PLC and back up PLC software.</li> </ol>
<b>Learning Unit</b>	<b>AC Motor Drivers and PLC Connections</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the connections of PLC and AC motor driver.</li> <li>2. Students will be able to run the AC motor driver via PLC analog output.</li> </ol>

## THE BRANCH OF ELECTRICAL APPLIANCES TECHNICAL SERVICE

### SMALL HOME APPLIANCES WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to carrying out the maintenance and repair of small electrical appliances and building electrical control circuits under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Drinking Water Heaters</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of water heaters (kettles).</li> <li>2. Students will be able to perform the maintenance and repair of tea makers.</li> <li>3. Students will be able to perform the maintenance and repair of coffee makers.</li> <li>4. Students will be able to perform the maintenance and repair of Turkish Coffee makers.</li> </ol>
<b>Learning Unit</b>	<b>Blenders and Mixers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of blenders and choppers.</li> <li>2. Students will be able to perform the maintenance and repair of food processors.</li> <li>3. Students will be able to perform the maintenance and repair of mixers.</li> <li>4. Students will be able to perform the adjustments, maintenance and repair of meat grinders.</li> <li>5. Students will be able to perform the maintenance and repair of Juicers.</li> </ol>
<b>Learning Unit</b>	<b>Cookers and Heaters</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of sandwich makers.</li> <li>2. Students will be able to perform the maintenance and repair of toasters.</li> <li>3. Students will be able to perform the maintenance and repair of deep fryers.</li> <li>4. Students will be able to perform the maintenance and repair of steam cooker.</li> <li>5. Students will be able to perform the maintenance and repair of grills.</li> <li>6. Students will be able to perform the maintenance and repair of bread makers.</li> </ol>
<b>Learning Unit</b>	<b>Kitchen Hood and Fans</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of kitchen hoods.</li> <li>2. Students will be able to perform the maintenance and repair of cooker hoods.</li> <li>3. Students will be able to perform the maintenance and repair of fans.</li> </ol>
<b>Learning Unit</b>	<b>Electric Cookers and Stoves</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of electric cookers.</li> <li>2. Students will be able to perform the maintenance and repair of electric stoves.</li> </ol>

<b>Learning Unit</b>	<b>Irons</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of steam generator irons.</li> <li>2. Students will be able to perform the maintenance and repair of steam tank irons.</li> <li>3. Students will be able to perform the maintenance and repair of steam cleaners.</li> </ol>
<b>Learning Unit</b>	<b>Vacuum Cleaners</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of chargeable vacuum cleaners.</li> <li>2. Students will be able to perform the maintenance and repair of bagged/bagless and water filter vacuum cleaners.</li> <li>3. Students will be able to perform the maintenance and repair of carpet washing machines.</li> <li>4. Students will be able to perform the maintenance and repair of robot vacuum cleaners.</li> </ol>
<b>Learning Unit</b>	<b>Personal Care Appliances</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of hair dryers.</li> <li>2. Students will be able to perform the maintenance and repair of hair stylers and hair straighteners.</li> <li>3. Students will be able to perform the maintenance and repair of electric shavers and epilators.</li> </ol>
<b>Learning Unit</b>	<b>Motors of Electrical Home Appliances</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the connections, maintenance and repair of single-phase alternative current motors.</li> <li>2. Students will be able to perform the connections, maintenance and repair of direct current motors.</li> <li>3. Students will be able to perform the connections, maintenance and repair of brushless DC motors.</li> <li>4. Students will be able to build the connections of step and servo motors.</li> </ol>
<b>Learning Unit</b>	<b>Television Installation and Assembly</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install the television.</li> <li>2. Students will be able to carry out the connections and adjustments of televisions.</li> </ol>

## THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3



<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## COMPUTER AIDED CIRCUIT DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

### HOME APPLIANCES WITH INSTALLATION WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of household appliances with installations under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Basic Water Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the measurement of water hardness and water pressure.</li> <li>2. Students will be able to build clean water and waste water installations for electric washer machines.</li> </ol>
<b>Learning Unit</b>	<b>Utility Water Heaters</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation, maintenance and repair of instant water heaters.</li> <li>2. Students will be able to perform the installation, maintenance and repair of thermosyphon system.</li> <li>3. Students will be able to perform the installation, maintenance and repair of geysers.</li> <li>4. Students will be able to perform the installation, maintenance and repair of central heating boilers.</li> </ol>
<b>Learning Unit</b>	<b>Washing Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install washing machines.</li> <li>2. Students will be able to explain the structure and working of washing machines.</li> <li>3. Students will be able to perform assembly and disassembly of washing machines.</li> <li>4. Students will be able to perform the maintenance and repair of washing machines.</li> </ol>
<b>Learning Unit</b>	<b>Drying Machines</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install drying machines.</li> <li>2. Students will be able to explain the structure and working of drying machines.</li> <li>3. Students will be able to perform assembly and disassembly of drying machines.</li> <li>4. Students will be able to perform the maintenance and repair of drying machines.</li> </ol>
<b>Learning Unit</b>	<b>Dishwashers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install dishwashers.</li> <li>2. Students will be able to explain the structure and working of dishwashers.</li> <li>3. Students will be able to perform assembly and disassembly of dishwashers.</li> <li>4. Students will be able to perform the maintenance and repair of dishwashers.</li> </ol>
<b>Learning Unit</b>	<b>Microwave and Gas Stove Electric Ovens</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of microwave ovens.</li> <li>2. Students will be able to perform the maintenance and repair of gas stove electric ovens.</li> </ol>

## REFRIGERATORS AND AIR CONDITIONERS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of refrigerators and air conditioning systems under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 8

<b>Learning Unit</b>	<b>Electric Control Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to select motor control circuit elements and install them.</li> <li>2. Students will be able to build asynchronous motor control circuits.</li> <li>3. Students will be able to build the connections of inverter circuits.</li> </ol>
<b>Learning Unit</b>	<b>Refrigerating Appliances</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation and assembly of refrigerating appliances.</li> <li>2. Students will be able to explain the structure, working and parts of refrigerators.</li> <li>3. Students will be able to carry out the post installation tests of refrigerators.</li> <li>4. Students will be able to perform the maintenance and repair of refrigerators.</li> </ol>
<b>Learning Unit</b>	<b>Air Conditioners</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the selection of air conditioners.</li> <li>2. Students will be able to perform the installation and assembly of air conditioners.</li> <li>3. Students will be able to explain the structure, working and parts of air conditioners.</li> <li>4. Students will be able to carry out the post installation tests of air conditioners.</li> <li>5. Students will be able to perform the maintenance and repair of air conditioners.</li> </ol>

## THE BRANCH OF ELECTRONICS AND COMMUNICATION

### ELECTRONICS WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building various electronic circuits under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Switching Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain trouble shooting methods.</li> <li>2. Students will be able to build relay switching circuits.</li> <li>3. Students will be able to build transistorized switching circuits.</li> <li>4. Students will be able to build FET and MOSFET switching circuits.</li> <li>5. Students will be able to build IGBT switching circuits.</li> <li>6. Students will be able to build thyristor switching circuits.</li> <li>7. Students will be able to build triac switching circuits.</li> <li>8. Students will be able to build opto-coupler switching circuits.</li> </ol>
<b>Learning Unit</b>	<b>Sensor Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of sensors and transducers.</li> <li>2. Students will be able to perform heat sensor applications.</li> <li>3. Students will be able to perform magnetic sensor applications.</li> <li>4. Students will be able to perform pressure sensor applications.</li> <li>5. Students will be able to perform optic sensor applications.</li> <li>6. Students will be able to perform sound sensor applications.</li> </ol>
<b>Learning Unit</b>	<b>Operational Amplifier Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of operational amplifiers.</li> <li>2. Students will be able to perform operational amplifier circuit applications.</li> </ol>
<b>Learning Unit</b>	<b>Oscillator and Filter Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build oscillator circuits.</li> <li>2. Students will be able to build pulse circuits.</li> <li>3. Students will be able to build filter circuits.</li> </ol>
<b>Learning Unit</b>	<b>Sound Frequency Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build head amplifier circuit.</li> <li>2. Students will be able to build power amplifier circuit.</li> <li>3. Students will be able to build bass-treble circuit.</li> <li>4. Students will be able to build echo circuit.</li> <li>5. Students will be able to build vu meter circuit.</li> </ol>

### THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## COMPUTER AIDED CIRCUIT DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

## **MICROCONTROLLERS AND SAFETY WORKSHOP**

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building microcontroller and safety circuits and encoding them under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Number Systems and Logic Gates</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the number systems.</li> <li>2. Students will be able to perform the converting operations among number systems.</li> <li>3. Students will be able to explain logic integrations.</li> <li>4. Students will be able to explain logic gates.</li> <li>5. Students will be able to perform logic gate applications.</li> </ol>
<b>Learning Unit</b>	<b>Microcontrollers and Coding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain microprocessors and microcontrollers.</li> <li>2. Students will be able to explain the hardware structure and features of microcontroller card.</li> <li>3. Students will be able to use the editor software of microcontroller.</li> <li>4. Students will be able to install software to microcontroller.</li> <li>5. Students will be able to design algorithm.</li> <li>6. Students will be able to perform basic coding operations.</li> <li>7. Students will be able to perform digital input output operations.</li> <li>8. Students will be able to perform serial port operations.</li> <li>9. Students will be able to perform analog input output operations.</li> <li>10. Students will be able to perform breaking operations.</li> <li>11. Students will be able to carry out EEPROM processes.</li> </ol>
<b>Learning Unit</b>	<b>Microcontroller Applications</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to upload library files.</li> <li>2. Students will be able to perform keypad applications with microcontroller.</li> <li>3. Students will be able to perform sensor applications with microcontroller.</li> <li>4. Students will be able to carry out LCD applications.</li> <li>5. Students will be able to perform electric motor applications.</li> <li>6. Students will be able to carry out communication applications.</li> <li>7. Students will be able to carry out robot applications.</li> </ol>
<b>Learning Unit</b>	<b>Fire Alarm Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the connections of fire alarm control panel.</li> <li>2. Students will be able to build the connections of the hardware of fire alarm control panel.</li> </ol>
<b>Learning Unit</b>	<b>Intruder Alarm Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the connections of intruder alarm system control panel.</li> <li>2. Students will be able to build the connections of the hardware of intruder alarm system control panel.</li> <li>3. Students will be able to encode the intruder alarm system control panel.</li> </ol>
<b>Learning Unit</b>	<b>Electronic Safety Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build fire alarm circuits.</li> <li>2. Students will be able to build intruder alarm circuits.</li> <li>3. Students will be able to build access control circuits.</li> <li>4. Students will be able to build smart home control circuits.</li> </ol>

## VIDEO SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of video devices under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Television Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the television system.</li> <li>2. Students will be able to explain the types of televisions.</li> <li>3. Students will be able to explain CRT televisions.</li> <li>4. Students will be able to perform the maintenance and repair of SMPS.</li> <li>5. Students will be able to perform the maintenance and repair LED lightings of TVs.</li> <li>6. Students will be able to repair the faults on TVs.</li> </ol>
<b>Learning Unit</b>	<b>Satellite Antenna Installation Assembly</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain satellite antenna installation materials and devices.</li> <li>2. Students will be able to perform the installation of single-subscription satellite antenna systems.</li> <li>3. Students will be able to perform the installation of multi-subscription satellite antenna systems.</li> <li>4. Students will be able to install head-end distribution system.</li> </ol>

<b>Learning Unit</b>	<b>Closed Circuit Camera Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain analog HD CCTV systems.</li> <li>2. Students will be able to explain digital HD CCTV systems.</li> <li>3. Students will be able to perform the installation of single-camera recording system.</li> <li>4. Students will be able to perform the installation of multi-camera recording system.</li> </ol>

## COMMUNICATION

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building communication installation circuits under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Basics of Communications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the basic terms of communication systems.</li> <li>2. Students will be able to explain the specifications and types of signals.</li> <li>3. Students will be able to explain the distortions and noise problems caused by transmission medium.</li> <li>4. Students will be able to explain the band width of signals with examples.</li> </ol>
<b>Learning Unit</b>	<b>Analog Communication</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of the elements utilized in analog communication.</li> <li>2. Students will be able to explain the analog modulation types and their features.</li> <li>3. Students will be able to explain analog modulation circuits.</li> <li>4. Students will be able to explain the analog demodulation types and their features.</li> <li>5. Students will be able to explain analog demodulation circuits.</li> <li>6. Students will be able to build FM radio receiver circuit.</li> <li>7. Students will be able to build FM radio transmitter circuit.</li> </ol>
<b>Learning Unit</b>	<b>Digital Communication</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the basics of digital communication and the specifications of the elements utilized in communications.</li> <li>2. Students will be able to explain the digital modulation types and their features.</li> <li>3. Students will be able to explain digital modulation circuits.</li> <li>4. Students will be able to explain the digital demodulation types and their features.</li> <li>5. Students will be able to explain digital demodulation circuits.</li> </ol>
<b>Learning Unit</b>	<b>Communication Methods</b>



<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features and types of electric line communication systems and build their circuits.</li> <li>2. Students will be able to couple communication cables.</li> <li>3. Students will be able to explain the features and types of fiber-optic communication systems and build their circuits.</li> <li>4. Students will be able to explain the features and types of wireless communication systems and build their circuits.</li> </ol>
<b>Learning Unit</b>	<b>Indoor Communication Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the elements utilized in indoor communication installations.</li> <li>2. Students will be able to install indoor system room.</li> <li>3. Students will be able to draw the projects of indoor communication installations.</li> <li>4. Students will be able to perform the assembly of indoor communication installations.</li> <li>5. Students will be able to locate the faults of indoor communication installations and perform its maintenance and repair.</li> </ol>
<b>Learning Unit</b>	<b>Network Structures</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain network topologies.</li> <li>2. Students will be able to explain the techniques of voice over IP (VoIP).</li> <li>3. Students will be able to explain the communication system over networks (internet) and its specifications.</li> <li>4. Students will be able to set up networks via network set up simulation software and perform tests.</li> </ol>

## THE BRANCH OF INDUSTRIAL MAINTENANCE AND REPAIR

### COMMAND AND CONTROL WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and skills related to setting up control circuits and hydraulic-pneumatic circuits related to electric machines and industrial electric systems in compliance with the Regulation of Electric Power Current Facilities, under the occupational health and safety measures,

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Asynchronous Motor Command Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to define command circuit elements.</li> <li>2. Students will be able to draw command and power circuit symbols.</li> <li>3. Students will be able to draw command and power circuits.</li> <li>4. Students will be able to build command and power circuits.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motors Starting Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the development and effects of asynchronous motors.</li> <li>2. Students will be able to carry out the applications of starting asynchronous motors.</li> <li>3. Students will be able to carry out the rpm adjustments with AC motor drivers.</li> <li>4. Students will be able to carry out the starting application of two-cycle asynchronous motors.</li> </ol>

<b>Learning Unit</b>	<b>Braking in Asynchronous Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of braking system.</li> <li>2. Students will be able to stop three-phase asynchronous motors with a padded brake system.</li> <li>3. Students will be able to stop three-phase asynchronous motors with a dynamic brake system.</li> </ol>
<b>Learning Unit</b>	<b>Pneumatic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of pneumatic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of pneumatic circuits.</li> <li>3. Students will be able to perform pneumatic system set up.</li> </ol>
<b>Learning Unit</b>	<b>Electropneumatic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of electropneumatic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of electropneumatic circuits.</li> <li>3. Students will be able to install electropneumatic systems.</li> </ol>
<b>Learning Unit</b>	<b>Hydraulic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of hydraulic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of hydraulic systems.</li> <li>3. Students will be able to install hydraulic systems.</li> </ol>
<b>Learning Unit</b>	<b>Electrohydraulic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of electrohydraulic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of electrohydraulic systems.</li> <li>3. Students will be able to install electrohydraulic systems.</li> </ol>
<b>Learning Unit</b>	<b>Control Panels and Their Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to cut the interior cable channels and rails of the panel.</li> <li>2. Students will be able to install the interior channels and rails of the panel.</li> <li>3. Students will be able to install signal lamps.</li> <li>4. Students will be able to install residual current device and circuit breakers.</li> <li>5. Students will be able to perform the installation of contactor and overcurrent relay.</li> <li>6. Students will be able to crimp cable lug and ferrules and perform numbering.</li> <li>7. Students will be able to connect the cables to the devices.</li> <li>8. Students will be able to arrange the cables with cable tie and spiral.</li> <li>9. Students will be able to carry out panel tests.</li> </ol>
<b>Learning Unit</b>	<b>Industrial Electrometers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to read meter indexes.</li> <li>2. Students will be able to mount three-phase electrometers.</li> <li>3. Students will be able to make connections of three-phase direct combined electrometer.</li> <li>4. Students will be able to make connections of X5 combined electrometer.</li> </ol>
<b>Learning Unit</b>	<b>Distribution Panels</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw the sketches of interior layout and connections of distribution panels.</li> <li>2. Students will be able to carry out the selection of the materials of distribution panels.</li> <li>3. Students will be able to install the post insulator and busbars of distribution panels.</li> <li>4. Students will be able to install the interior channels and rails of the panel.</li> <li>5. Students will be able to install moulded case circuit breakers.</li> <li>6. Students will be able to install residual current relay with fire protection threshold, and column circuit breakers.</li> <li>7. Students will be able to perform the installation and connection of surge arrestor and surge arrestor circuit breakers.</li> <li>8. Students will be able to carry out the cabling of the interior of distribution panels.</li> <li>9. Students will be able to perform the installation and connection of signal lamps.</li> </ol>
<b>Learning Unit</b>	<b>Compensation Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the calculations of compensation system.</li> <li>2. Students will be able to select the materials of compensation Panels.</li> <li>3. Students will be able to install the post insulator and busbars of compensation panels.</li> <li>4. Students will be able to carry out the installation and build connections of the condenser stage elements.</li> <li>5. Students will be able to build the reactor connections on compensation panels with reactor.</li> <li>6. Students will be able to perform the installation, connection and adjustments of reactive power control relay and current transformers.</li> <li>7. Students will be able to estimate the penalty rate of the system via Combi electricity meter indexes.</li> <li>8. Students will be able to perform the ventilation and illumination of compensation panels.</li> </ol>
<b>Learning Unit</b>	<b>Transformer Units</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance of the breakers.</li> <li>2. Students will be able to perform the breaker maneuvers.</li> <li>3. Students will be able to perform the maintenance and repair of disconnectors.</li> <li>4. Students will be able to perform the disconnector maneuvers.</li> <li>5. Students will be able to perform the installation and connection of surge connection devices.</li> <li>6. Students will be able to perform the installation and connection of HV circuit breakers.</li> <li>7. Students will be able to perform the maintenance and repair of distribution transformers.</li> </ol>

## THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## **COMPUTER AIDED CIRCUIT DESIGN**

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours:** 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

### **AUTOMATION WORKSHOP LESSON**

**Course Objectives** : The aim of this course is to provide students with the knowledge and skills related to performing PLC and automation applications in compliance with the Regulation of Heavy Current Electrical Installations and the Regulations of Groundings in Electrical Installations under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Industrial Sensors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of industrial sensors.</li> <li>2. Students will be able to carry out circuit applications with digital output sensors.</li> <li>3. Students will be able to carry out circuit applications with analog output sensors.</li> <li>4. Students will be able to carry out circuit applications with signal converter.</li> </ol>
<b>Learning Unit</b>	<b>Basic PLC Processes</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of PLC.</li> <li>2. Students will be able to choose the input elements of PLC.</li> <li>3. Students will be able to choose the output elements of PLC.</li> <li>4. Students will be able to make the input and output connections of PLC.</li> <li>5. Students will be able to select the hardware and equipment of PLC.</li> </ol>
<b>Learning Unit</b>	<b>PLC Coding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the logic of PLC coding and software languages.</li> <li>2. Students will be able to use PLC coding editor.</li> <li>3. Students will be able to perform digital operations via PLC.</li> <li>4. Students will be able to perform analog operations via PLC.</li> </ol>
<b>Learning Unit</b>	<b>Frequency Inverters</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of frequency inverters.</li> <li>2. Students will be able to carry out the connections and adjustments of frequency Inverters.</li> <li>3. Students will be able to check frequency inverters via PLC.</li> </ol>
<b>Learning Unit</b>	<b>Operator Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain operator panels.</li> <li>2. Students will be able to use operator panels coding editor.</li> <li>3. Students will be able to code operator panels.</li> </ol>
<b>Learning Unit</b>	<b>Control of Step Motor with PLC</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain step motors.</li> <li>2. Students will be able to perform the connections and adjustments of step motors.</li> <li>3. Students will be able to perform the control operations of step motors via PLC.</li> </ol>
<b>Learning Unit</b>	<b>Control of Servo Motor with PLC</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of servo motors.</li> <li>2. Students will be able to perform the connections and adjustments of servo motors.</li> <li>3. Students will be able to perform the control operations of servo motors via PLC.</li> </ol>

## INDUSTRIAL ELECTRONICS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building various industrial electronic circuits under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Switching Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain trouble shooting methods.</li> <li>2. Students will be able to build relay switching circuits.</li> <li>3. Students will be able to build transistorized switching circuits.</li> <li>4. Students will be able to build FET and MOSFET switching circuits.</li> <li>5. Students will be able to build IGBT switching circuits.</li> <li>6. Students will be able to build thyristor switching circuits.</li> <li>7. Students will be able to build triac switching circuits.</li> <li>8. Students will be able to build opto-coupler switching circuits.</li> </ol>
<b>Learning Unit</b>	<b>Sensor Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of sensors and transducers.</li> <li>2. Students will be able to perform heat sensor applications.</li> <li>3. Students will be able to perform magnetic sensor applications.</li> <li>4. Students will be able to perform pressure sensor applications.</li> <li>5. Students will be able to perform optic sensor applications.</li> <li>6. Students will be able to perform sound sensor applications.</li> </ol>
<b>Learning Unit</b>	<b>Operational Amplifier Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of operational amplifiers.</li> <li>2. Students will be able to perform operational amplifier circuit applications.</li> </ol>

## MICROCONTROLLERS AND CODING

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building microcontroller circuits and encoding them under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Number Systems and Logic Gates</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to explain the number systems.</li><li>2. Students will be able to perform the converting operations among number systems.</li><li>3. Students will be able to explain logic integrations.</li><li>4. Students will be able to explain logic gates.</li><li>5. Students will be able to perform logic gate applications.</li></ol>
<b>Learning Unit</b>	<b>Microcontrollers and Coding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to explain microprocessors and microcontrollers.</li><li>2. Students will be able to explain the hardware structure and features of microcontroller card.</li><li>3. Students will be able to use the editor software of microcontroller.</li><li>4. Students will be able to install software to microcontroller.</li><li>5. Students will be able to design algorithm.</li><li>6. Students will be able to perform basic coding operations.</li><li>7. Students will be able to perform digital input output operations.</li><li>8. Students will be able to perform serial port operations.</li><li>9. Students will be able to perform analog input output operations.</li><li>10. Students will be able to perform breaking operations.</li><li>11. Students will be able to carry out EEPROM processes.</li></ol>
<b>Learning Unit</b>	<b>Microcontroller Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to upload library files.</li><li>2. Students will be able to perform keypad applications with microcontroller.</li><li>3. Students will be able to perform sensor applications with microcontroller.</li><li>4. Students will be able to carry out LCD applications.</li><li>5. Students will be able to perform electric motor applications.</li><li>6. Students will be able to carry out communication applications.</li><li>7. Students will be able to carry out robot applications.</li></ol>

## THE BRANCH OF DEFENSE ELECTRONIC SYSTEMS

The curriculum of this branch is implemented only in Anatolian Technical Program.

## ANALOGUE-DIGITAL ELECTRONICS WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building analog-digital electronic circuits under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Switching Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain trouble shooting methods.</li> <li>2. Students will be able to build relay switching circuits.</li> <li>3. Students will be able to build transistorized switching circuits.</li> <li>4. Students will be able to build FET and MOSFET switching circuits.</li> <li>5. Students will be able to build IGBT switching circuits.</li> <li>6. Students will be able to build thyristor switching circuits.</li> <li>7. Students will be able to build triac switching circuits.</li> <li>8. Students will be able to build opto-coupler switching circuits.</li> </ol>
<b>Learning Unit</b>	<b>Sensor Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of sensors and transducers.</li> <li>2. Students will be able to perform heat sensor applications.</li> <li>3. Students will be able to perform magnetic sensor applications.</li> <li>4. Students will be able to perform pressure sensor applications.</li> <li>5. Students will be able to perform optic sensor applications.</li> <li>6. Students will be able to perform sound sensor applications.</li> </ol>
<b>Learning Unit</b>	<b>Operational Amplifier Circuit Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of operational amplifiers.</li> <li>2. Students will be able to perform operational amplifier circuit applications.</li> </ol>
<b>Learning Unit</b>	<b>Oscillator and Filter Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build oscillator circuits.</li> <li>2. Students will be able to build pulse circuits.</li> <li>3. Students will be able to build filter circuits.</li> </ol>
<b>Learning Unit</b>	<b>Radio Frequency Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to study modulation and demodulation circuits.</li> <li>2. Students will be able to build transmitter circuits.</li> <li>3. Students will be able to build receiver circuits.</li> </ol>
<b>Learning Unit</b>	<b>Digital Electronics Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform basic logic circuit applications.</li> <li>2. Students will be able to perform combined circuit applications.</li> <li>3. Students will be able to perform arithmetic circuit applications.</li> <li>4. Students will be able to perform sequential logic circuit applications.</li> <li>5. Students will be able to perform counter and recorder circuit applications.</li> <li>6. Students will be able to perform ADC-DAC circuit applications.</li> </ol>

## THE PRINCIPLES OF ELECTRIC-ELECTRONICS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to carrying out electric-electronics circuit calculations and basic electrical circuit law experiments under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 3



<b>Learning Unit</b>	<b>Basic Principles of Electric</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the usage of electric energy sources.</li> <li>2. Students will be able to explain electric energy plants and the stages of electricity generation.</li> <li>3. Students will be able to explain the structure of the atom and electrons.</li> <li>4. Students will be able to carry out the calculations of electric charges and electric field.</li> <li>5. Students will be able to explain the specifications and effects of electric current.</li> <li>6. Students will be able to explain the specifications of electric voltage.</li> <li>7. Students will be able to explain static electric and electrification methods.</li> </ol>
<b>Learning Unit</b>	<b>Direct Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of direct current.</li> <li>2. Students will be able to explain the sources of direct current.</li> <li>3. Students will be able to carry out the calculation and coupling of direct current circuits.</li> <li>4. Students will be able to calculate the OHM's Law with formulas and test it.</li> <li>5. Students will be able to calculate the Kirchhoff's Laws with formulas and test it.</li> <li>6. Students will be able to carry out condenser and connection calculations.</li> <li>7. Students will be able to carry out coils and connection calculations.</li> </ol>
<b>Learning Unit</b>	<b>Alternative Current Principles</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications and the generation of alternative current.</li> <li>2. Students will be able to calculate the vector illustration of alternative current components.</li> <li>3. Students will be able to explain the coils in alternative current.</li> <li>4. Students will be able to explain the condensers in alternative current.</li> <li>5. Students will be able to carry out series, parallel and mixed circuit calculations in alternative current.</li> <li>6. Students will be able to carry out power calculations in alternative current.</li> <li>7. Students will be able to carry out resonance circuit calculations in alternative current.</li> <li>8. Students will be able to explain the specifications and types of transformers.</li> <li>9. Students will be able to carry out transforming calculations of transformer.</li> <li>10. Students will be able to carry out the power and efficiency calculations in transformer.</li> </ol>

## COMPUTER AIDED CIRCUIT DESIGN

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to drawing electronic circuits, performing their simulations and drawing their printed circuits on computer aided simulation software under the occupational health and safety measures.

**Grade** : 10

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Computer Aided Circuit Drawing and Simulation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use electronic circuit simulation software.</li> <li>2. Students will be able to perform basic processes on electronic circuit simulation software.</li> <li>3. Students will be able to use the components and measurement tools of electronic elements on electronic circuit simulation software.</li> <li>4. Students will be able to design various electronic circuits and run them on electronic circuit simulation software.</li> </ol>
<b>Learning Unit</b>	<b>Computer Aided Printed Circuit Drawing</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to use printed circuit software.</li> <li>2. Students will be able to perform basic processes on printed circuit software.</li> <li>3. Students will be able to design new symbols and PCB case on printed circuit drawing software.</li> <li>4. Students will be able to carry out automatic printed circuit drawing operations on printed circuit drawing software.</li> <li>5. Students will be able to print out the printed circuit.</li> </ol>

### DEFENSE ELECTRONICS WORKSHOP

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing cabling, electronic card installation and electro-mechanic installation, under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Cabling</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to read cabling document.</li> <li>2. Students will be able to carry out cable set preparation.</li> <li>3. Students will be able to perform the cutting and labeling of cables.</li> <li>4. CX Students will be able to carry out the production of CX cable set.</li> <li>5. CX Students will be able to carry out the production of fiber-optic cable set.</li> <li>6. RF Students will be able to carry out the production of RF cable set.</li> <li>7. Students will be able to perform the production preparations of cable harness.</li> <li>8. Students will be able to carry out the production of cable harnesses.</li> <li>9. Students will be able to perform conductive protective coating.</li> <li>10. Students will be able to perform non-conductive protective coating.</li> </ol>
<b>Learning Unit</b>	<b>Electronic Card Assembly</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out preparations before manual soldering.</li> <li>2. Students will be able to perform the manual soldering of components.</li> <li>3. Students will be able to carry out preparations before machine soldering.</li> <li>4. Students will be able to perform solder paste application.</li> <li>5. Students will be able to perform typesetting.</li> <li>6. Students will be able to carry out reflow processes.</li> <li>7. Students will be able to perform selective soldering.</li> <li>8. Students will be able to perform wave soldering.</li> <li>9. Students will be able to clean the card.</li> <li>10. Students will be able to inspect the card.</li> <li>11. Students will be able to perform adhesive applications.</li> <li>12. Students will be able to perform conformal coating.</li> <li>13. Students will be able to perform pre-rework and pre-repair</li> </ol>

	preparations. <b>14.</b> Students will be able to perform manual rework. <b>15.</b> Students will be able to perform rework on rework station. <b>16.</b> Students will be able to perform repair operations.
<b>Learning Unit</b>	<b>Electromechanical Assembly</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out pre-assembly preparations.</li> <li>2. Students will be able to perform the assembly of heat sinks and insulators.</li> <li>3. Students will be able to perform the assembly of electronic card in mechanical module.</li> <li>4. Students will be able to assemble the display.</li> <li>5. Students will be able to carry out the preparation for the assembly of mechanical body.</li> <li>6. Students will be able to carry out the placement of the equipment inside the device.</li> <li>7. Students will be able to perform pre-package operations.</li> <li>8. Students will be able to carry out packaging operations.</li> </ol>

## CODING WITH MICROCONTROLLERS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to coding with microcontrollers under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Microcontrollers and Coding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain microprocessors and microcontrollers.</li> <li>2. Students will be able to explain the hardware structure and features of microcontroller card.</li> <li>3. Students will be able to use the editor software of microcontroller.</li> <li>4. Students will be able to install software to microcontroller.</li> <li>5. Students will be able to design algorithm.</li> <li>6. Students will be able to perform basic coding operations.</li> <li>7. Students will be able to perform digital input output operations.</li> <li>8. Students will be able to perform serial port operations.</li> <li>9. Students will be able to perform analog input output operations.</li> <li>10. Students will be able to perform breaking operations.</li> <li>11. Students will be able to carry out EEPROM processes.</li> </ol>
<b>Learning Unit</b>	<b>Microcontroller Applications</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to upload library files.</li> <li>2. Students will be able to perform keypad applications with microcontroller.</li> <li>3. Students will be able to perform sensor applications with microcontroller.</li> <li>4. Students will be able to carry out LCD applications.</li> <li>5. Students will be able to perform electric motor applications.</li> <li>6. Students will be able to carry out communication applications.</li> <li>7. Students will be able to carry out robot applications.</li> </ol>

## TEST APPLICATIONS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing test applications under the occupational health and safety measures.

**Grade** : 11

**Weekly Course Hours** : 5

<b>Learning Unit</b>	<b>Electronic Hardware Tests</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to carry out the preparations for electronic hardware tests.</li><li>2. Students will be able to perform electrical hardware tests.</li><li>3. Students will be able to carry out functional tests.</li><li>4. Students will be able to carry out post-test operations.</li></ol>
<b>Learning Unit</b>	<b>Cable Tests</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform cable physical check tests.</li><li>2. Students will be able to perform electrical tests of cables.</li></ol>
<b>Learning Unit</b>	<b>Ambient Conditions</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform heat- humidity/heat-shock tests.</li><li>2. Students will be able to perform vibration/shock tests.</li><li>3. Students will be able to perform low pressure (altitude) tests.</li><li>4. Students will be able to perform salt fog tests.</li><li>5. Students will be able to perform rain tests and leak tightness tests.</li></ol>
<b>Learning Unit</b>	<b>Electromagnetic Compatibility (EMC) Tests</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the conducted emission tests.</li><li>2. Students will be able to perform the conducted immunity tests.</li><li>3. Students will be able to perform the radiated emission tests.</li><li>4. Students will be able to perform the radiated immunity tests.</li></ol>

### 6.3. ON-SITE VOCATIONAL TRAINING

Students carry out on-site vocational training in the businesses which operate on the branch that students are educated in accordance with the Ministry of Education Regulation Secondary Education Institutes. The content of on-site vocational training is determined by the coordinator teachers at school, the teachers of the field and the authorities of the partner businesses considering the local needs and the vocational field on which the business run. The students who are in the program types which do not involve on-site vocational training attend job trainings in accordance with the related legislation.

### 6.4. ACADEMIC SUPPORT COURSES

The courses within the Academic Support which are available on the 12th grade of Anatolian Technical Program are the courses which enable students to study for the higher education programs they aim at.

## 6.5. ELECTIVE VOCATIONAL COURSES

These are the courses which enable students to develop in the field they aim at and they tend to, to move on in several programs in accordance with their interests and wishes, and to develop their personal skills. Elective vocational courses consist of a profession or an important piece of a profession.

Therefore, elective vocational courses should be selected by considering prerequisite learnings and the connections between the courses for the purpose that they constitute an integrity, and in compliance with horizontal and vertical coherence principles.

### 6.5.1. THE TABLE OF CERTIFICATE COURSES

Branch Name	Certificate Name	Courses	Course Hours
Electric Installations and Distribution	High Voltage Systems	HV Systems	9
		Switching and Automation in HV Installations	4
Electronics and Communication	Video and Audio Systems	Multimedia Systems	3
		Sound and Light Systems	4
	Security Systems	Smart Home Systems	3
		Access Control Systems	4
	Communication Systems	GSM Telephones	3
		Communication Network Infrastructures	4
All Branches of the Field	Office Machinery Technical Service	Printing Machines	3
		Fax Machines	2
		Cash Tills and Bill Counters	2
		Printers	2
All Branches of the Field	Coil Winding	AC Motor Control and Winding Techniques	7
		DC Motor Winding Techniques	4
		Transformer Winding	3
All Branches of the Field	Digital Skills	Programming	3
		Digital Design	2
		Social Media	2

### 6.5.2. THE TABLE OF ELECTIVE VOCATIONAL COURSES

Course	Grade	Course Hours
3D MODELING	11-12	3
AC MOTOR CONTROL AND WINDING TECHNIQUES	11-12	7

SMART HOME SYSTEMS	11-12	3
ELEVATOR FINAL CHECKS AND TESTS	11-12	4
PRINTING MACHINES	11-12	3
MULTIMEDIA SYSTEMS	11-12	3
DISTRIBUTION NETWORK AND TARIFFS	11-12	3
DC MOTOR WINDING TECHNIQUES	11-12	4
ELECTRIC-ELECTRONIC PROJECTS	11-12	7
INDUSTRIAL KITCHEN AND WASHERS	11-12	7
FAX MACHINES	11-12	2
ACCESS CONTROL SYSTEMS	11-12	4
GSM TELEPHONES	11-12	3
COMMUNICATION NETWORK INFRASTRUCTURES	11-12	4
HYDRAULIC AND PNEUMATIC SYSTEMS	11-12	3
ADVANCED MICROCONTROLLER APPLICATIONS	11-12	7
DRAWINGS OF PANEL PROJECTS	11-12	3
SOUND AND LIGHT SYSTEMS	11-12	4
BASIC ROBOTIC APPLICATIONS	11-12	7
TRANSFORMER WINDING	11-12	3
CASH TILLS AND BILL COUNTERS	11-12	2
PRINTERS	11-12	2
HV SYSTEMS	11-12	9
SWITCHING AND AUTOMATION IN HV INSTALLATIONS	11-12	4
ESCALATOR PATH SYSTEMS	11-12	3
PROGRAMMING	11-12	3
DIGITAL DESIGN	11-12	2
SOCIAL MEDIA	11-12	2

### 3D MODELING

**Course Objectives** : The aim of this course is to provide the students with the knowledge and skills related to manufacturing three dimensional pieces with 3D printers and drawing 2D shapes with 3D card processors under the occupational health and safety measures.

**Grade** :11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>3D Modeling Designs with 3D Design Software</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to run 3D design software.</li> <li>2. Students will be able to explain the menus and toolbars of 3D design software.</li> <li>3. Students will be able to explain the settings on 3D design software.</li> <li>4. Students will be able to run basic operations on 3D design software.</li> <li>5. Students will be able to build 3 dimensional models on 3D design software.</li> </ol>
<b>Learning Unit</b>	<b>3D Printers and Their Features</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of 3D Printers</li> <li>2. Students will be able to explain the components of 3D Printers</li> <li>3. Students will be able to build the electric and mechanical connections of 3D printers.</li> <li>4. Students will be able to build the electric and mechanical connections of the hardware and accessories of 3D printers.</li> <li>5. Students will be able to perform the placements of printed productions and design the products.</li> <li>6. Students will be able to perform the maintenance of 3D printers.</li> </ol>
<b>Learning Unit</b>	<b>Print-out Operations on 3D Printers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the three dimensional model.</li> <li>2. Students will be able to transfer STL file into the interface program.</li> <li>3. Students will be able to perform the transfer of the processed file (gCode) and carry out print-out operations.</li> <li>4. Students will be able to dip the printout into chemical solution.</li> <li>5. Students will be able to treat the product.</li> </ol>

## AC MOTOR CONTROL AND WINDING TECHNIQUES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the alternative current (AC) motor control and winding under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 7

<b>Learning Unit</b>	<b>Command Circuit Elements</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the structure of asynchronous motor and the label information.</li> <li>2. Students will be able to carry out the electric terminal connections of asynchronous motors.</li> <li>3. Students will be able to carry out the selection and connection of contactors.</li> <li>4. Students will be able to build the connections of overcurrent relay.</li> <li>5. Students will be able to install the connections of time relay.</li> <li>6. Students will be able to make the connections of protection relay.</li> <li>7. Students will be able to make the connections of cam switches.</li> </ol>
<b>Learning Unit</b>	<b>Asynchronous Motor Command Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to define command circuit elements.</li> <li>2. Students will be able to draw command and power circuit symbols.</li> <li>3. Students will be able to draw command and power circuits.</li> <li>4. Students will be able to build command and power circuits.</li> </ol>

<b>Learning Unit</b>	<b>Asynchronous Motors Starting Techniques</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the development and effects of asynchronous motors.</li> <li>2. Students will be able to carry out the applications of starting asynchronous motors.</li> <li>3. Students will be able to carry out the rpm adjustments with AC motor drivers.</li> <li>4. Students will be able to carry out the starting application of two-cycle asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Braking in Asynchronous Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of braking system.</li> <li>2. Students will be able to install padded brake systems in three-phase asynchronous motors.</li> <li>3. Students will be able to install dynamic brake systems in three-phase asynchronous motors.</li> </ol>
<b>Learning Unit</b>	<b>Electrical and Mechanical Maintenance of a Motor without Collector</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the troubleshooting of the motor without collector.</li> <li>2. Students will be able to change the failed condenser.</li> <li>3. Students will be able to change the failed centrifugal switch set.</li> <li>4. Students will be able to perform the rotor check in compliance with the rotor type.</li> <li>5. Students will be able to determine the motor type.</li> </ol>
<b>Learning Unit</b>	<b>The Assembly of Motors without Collector</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the group connections and terminal boxes of coils.</li> <li>2. Students will be able to perform the insulation of motors.</li> <li>3. Students will be able to carry out the tests of motors.</li> <li>4. Students will be able to assemble the motors.</li> <li>5. Students will be able to perform the final checks of motors.</li> <li>6. Students will be able to prepare the cartex of the motor.</li> </ol>
<b>Learning Unit</b>	<b>Manual Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unwind manual stator windings.</li> <li>2. Students will be able to perform the winding of manual stator windings.</li> </ol>
<b>Learning Unit</b>	<b>Half-Coil Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unwind half-coil stator windings.</li> <li>2. Students will be able to perform the winding of half-coil stator windings.</li> </ol>
<b>Learning Unit</b>	<b>Whole-Coil Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unwind whole-coil stator windings.</li> <li>2. Students will be able to perform the winding of whole-coil stator windings.</li> </ol>
<b>Learning Unit</b>	<b>Special Windings</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the winding of short-pitch stator windings.</li> <li>2. Students will be able to perform stepped half-coil winding.</li> <li>3. Students will be able to perform Dahlander winding.</li> </ol>
<b>Learning Unit</b>	<b>Single Phase Motor Winding</b>



<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the winding of single phase motors with auxiliary winding.</li> <li>2. Students will be able to perform the winding of shaded-pole motors.</li> <li>3. Students will be able to perform the winding of reluctance motors.</li> </ol>
<b>Learning Unit</b>	<b>The Winding of Alternators</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the alternator stator for winding.</li> <li>2. Students will be able to perform the winding of alternator stators.</li> </ol>
<b>Learning Unit</b>	<b>Step-Servo Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assemble the drivers of step motors.</li> <li>2. Students will be able to assemble the drivers of servo motors.</li> </ol>
<b>Learning Unit</b>	<b>The Mechanical Maintenance of Servo Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unmount the servo motor.</li> <li>2. Students will be able to perform the repair of servo motors.</li> </ol>

## SMART HOME SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to installing smart home systems under the occupational health and safety measures.

**Grade** :11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Introduction to Smart Home Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install smart home systems.</li> <li>2. Students will be able to design smart home system scenarios.</li> </ol>
<b>Learning Unit</b>	<b>Comfort in Smart Home Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install smart home lighting systems.</li> <li>2. Students will be able to install smart home plug-socket systems.</li> <li>3. Students will be able to install smart home heating systems.</li> <li>4. Students will be able to install smart home window blind and shutter control systems.</li> <li>5. Students will be able to install smart home sound broadcasting systems.</li> <li>6. Students will be able to introduce the smart home controllers to the system.</li> </ol>
<b>Learning Unit</b>	<b>Security, Media and Remote Access in Smart Home Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design smart home systems security applications.</li> <li>2. Students will be able to design smart home systems communication and media applications.</li> <li>3. Students will be able to carry out remote access operations of smart home systems.</li> <li>4. Students will be able to carry out applications for smart home systems scenarios.</li> </ol>

## ELEVATOR FINAL CHECKS AND TESTS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing required tests and checks after finishing the assembly under the occupational health and safety measures.

**Grade** :11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Operations Before Final Checks of Elevators</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the related regulation and standards.</li> <li>2. Students will be able to utilize correct measurement tools during inspection.</li> <li>3. Students will be able to explain the safety measures before inspection.</li> </ol>
<b>Learning Unit</b>	<b>Inspection form and Elevator Inspection</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to determine the convenience of periodic inspection.</li> <li>2. Students will be able to explain the operations which are required to be carried out during inspection.</li> <li>3. Students will be able to perform inspections of machine roomless elevators.</li> <li>4. Students will be able to perform the inspections of hydraulic elevators.</li> <li>5. Students will be able to carry out additional inspections.</li> </ol>
<b>Learning Unit</b>	<b>Elevator Tests</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the tests in machine room.</li> <li>2. Students will be able to perform the tests of elevator pit height and elevator cabin tests.</li> <li>3. Students will be able to perform the tests of hydraulic elevators.</li> <li>4. Students will be able to perform the post-inspection operations.</li> </ol>

## PRINTING MACHINES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of photocopiers and printing machines under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>The Installation of Photocopiers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of photocopiers.</li> <li>2. Students will be able to perform the introduction of photocopiers.</li> </ol>
<b>Learning Unit</b>	<b>The Maintenance of Photocopiers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance of optical character recognition system on photocopiers.</li> <li>2. Students will be able to perform the maintenance of imaging system on photocopiers.</li> <li>3. Students will be able to perform the maintenance of paper feeding system on photocopiers.</li> <li>4. Students will be able to perform the maintenance of printing and fuser</li> </ol>

	<p>units of photocopiers.</p> <ol style="list-style-type: none"> <li>Students will be able to perform the maintenance of auxiliary units of photocopiers.</li> <li>Students will be able to perform the periodical maintenance of photocopiers.</li> </ol>
<b>Learning Unit</b>	<b>Troubleshooting on Photocopiers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to perform the adjustments of photocopiers.</li> <li>Students will be able to fix the image faults of photocopiers.</li> <li>Students will be able to fix the functional faults of photocopiers.</li> <li>Students will be able to fix the paper feeding faults of photocopiers.</li> <li>Students will be able to adjust the functions of circuit elements of photocopiers.</li> </ol>
<b>Learning Unit</b>	<b>The Installation of Printing Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to perform the installation of printing machine (priport).</li> <li>Students will be able to perform the introduction of printing machine (priport).</li> </ol>
<b>Learning Unit</b>	<b>The Maintenance of Printing Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to change the consumables of priport.</li> <li>Students will be able to perform the maintenance of priportmaster preparation unit.</li> </ol>

## MULTIMEDIA SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of multimedia system appliances under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Stereos</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to perform the adjustments of stereos.</li> <li>Students will be able to fix the faults in stereos.</li> </ol>
<b>Learning Unit</b>	<b>Blu-Ray Disc/DVD Players</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to build the connections of Disc/DVD players.</li> <li>Students will be able to build the connections of Blu-Ray Disc/DVD Players.</li> <li>Students will be able to fix the faults in Blu-Ray Disc/DVD Players.</li> </ol>
<b>Learning Unit</b>	<b>Projectors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to build the connections of projectors.</li> <li>Students will be able to fix the faults in projectors.</li> </ol>
<b>Learning Unit</b>	<b>Cameras and Security Devices</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>Students will be able to perform the installation and adjustments of cameras.</li> <li>Students will be able to perform the installation and adjustments of security devices.</li> <li>Students will be able to do the settings of monitors.</li> <li>Students will be able to repair the faults on cameras.</li> </ol>

<b>Learning Unit</b>	<b>Home Theater Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the connections and perform the repair of speakers and headphones.</li> <li>2. Students will be able to build the connections and perform the repair of home theater systems.</li> </ol>
<b>Learning Unit</b>	<b>Televisions (TV)</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the connections and repair of LCD TVs.</li> <li>2. Students will be able to perform the connections and repair of LED TVs.</li> <li>3. Students will be able to perform the connections and repair of 4K UHD TVs.</li> <li>4. Students will be able to perform the connections and repair of 4K OLED TVs.</li> </ol>

### **DISTRIBUTION NETWORK AND TARIFFS**

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to generation of energy, electric networks, reading indexes, and the basis and procedures of electricity market in compliance with the regulations of Interior Electric Installations, Electric Heavy Current Installations, Groundings in Electric Installations and the law of occupational health and safety numbered 6331.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Generation of Energy</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the electric energy and its significance.</li> <li>2. Students will be able to explain the sources utilized in electric generation.</li> <li>3. Students will be able to explain the types and operating principles of electric plants.</li> <li>4. Students will be able to explain the structure of alternators and their electric generation principles.</li> <li>5. Students will be able to perform the connection of alternators in parallel.</li> </ol>
<b>Learning Unit</b>	<b>Electric Networks</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to classify the network types according to voltages and explain the specifications of each.</li> <li>2. Students will be able to classify the network types according to distribution methods and explain the specifications of each.</li> </ol>
<b>Learning Unit</b>	<b>Reading Indexes</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the index parameters and their meanings.</li> <li>2. Students will be able to explain the methods of reading indexes.</li> <li>3. Students will be able to perform the installation of remote index reading systems.</li> </ol>
<b>Learning Unit</b>	<b>The Basis and Procedures of Electricity Market</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain basic terms and market analysis.</li> <li>2. Students will be able to explain the basis of legislation.</li> <li>3. Students will be able to explain the consumer services and rights in electricity market.</li> <li>4. Students will be able to explain the components of electricity market.</li> <li>5. Students will be able to explain the tariffs of electricity consumption.</li> <li>6. Students will be able to explain the components of electricity bills.</li> </ol>
--------------------------	--

## DC MOTOR WINDING TECHNIQUES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the direct current (DC) motor winding under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Direct Current Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the connections of DC motors.</li> <li>2. Students will be able to adjust the rpm count of DC motors.</li> </ol>
<b>Learning Unit</b>	<b>Mechanical Faults in Electric Machinery</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the trouble shooting of mechanical parts.</li> <li>2. Students will be able to check the bearings.</li> </ol>
<b>Learning Unit</b>	<b>The Maintenance of Mechanical Parts</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to clean DC motor.</li> <li>2. Students will be able to change the electric terminal of DC motors.</li> <li>3. Students will be able to change the cooler fan of DC motors.</li> </ol>
<b>Learning Unit</b>	<b>Mechanical Part Repair in Electric Machinery</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to remove the cover of faulty DC motor.</li> <li>2. Students will be able to change the bearings.</li> <li>3. Students will be able to perform the balancing of rotor and armature.</li> </ol>
<b>Learning Unit</b>	<b>Faults in Collector Electric Motors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to change the collector brushes.</li> <li>2. Students will be able to perform the maintenance and repair of collector.</li> <li>3. Students will be able to perform the maintenance and repair of inductor.</li> <li>4. Students will be able to perform the maintenance and repair of armature.</li> </ol>
<b>Learning Unit</b>	<b>The Repair of Inductors</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to remove the faulty inductor.</li> <li>2. Students will be able to wind the inductor in accordance with factory norms.</li> </ol>
<b>Learning Unit</b>	<b>Armature Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unwind the armature.</li> <li>2. Students will be able to prepare the armature for winding.</li> <li>3. Students will be able to perform the basic parallel armature winding.</li> <li>4. Students will be able to perform the multi parallel armature winding.</li> </ol>

<b>Learning Unit</b>	<b>Single Phase Collector Motor Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unwind the armature of single phase collector motor.</li> <li>2. Students will be able to prepare the armature of single phase collector motor for winding.</li> <li>3. Students will be able to wind the coils of the armature of single phase collector motor.</li> </ol>
<b>Learning Unit</b>	<b>Insulation of Armature</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the checks after armature winding.</li> <li>2. Students will be able to put coil bandage on.</li> <li>3. Students will be able to varnish the armature coils.</li> </ol>
<b>Learning Unit</b>	<b>The Assembly of Motors with Collector</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assemble the collector motors.</li> <li>2. Students will be able to perform the final tests.</li> </ol>

## ELECTRIC-ELECTRONIC PROJECTS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to carrying out projects related to electric-electronic subjects under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 7

<b>Learning Unit</b>	<b>Project and Research</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain project and research.</li> <li>2. Students will be able to explain the common points which are required to be on a project.</li> <li>3. Students will be able to explain the specifications which a good project must have.</li> <li>4. Students will be able to explain the points to pay attention while preparing a project.</li> <li>5. Students will be able to explain the points to pay attention while applying for a project.</li> </ol>
<b>Learning Unit</b>	<b>Specifications of Projects</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications of projects according to student skills.</li> <li>2. Students will be able to explain the specifications of projects according to the needs of school, environment and industry.</li> <li>3. Students will be able to explain the steps necessary to take in order to determine the subject of project.</li> </ol>
<b>Learning Unit</b>	<b>Literature Review</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out literature review on the determined subject.</li> <li>2. Students will be able to perform necessary analysis after literature review.</li> <li>3. Students will be able to determine a project subject as a result of the analysis done.</li> </ol>
<b>Learning Unit</b>	<b>Preparation of Project Files</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the specifications which a project file must carry.</li> <li>2. Students will be able to explain the specifications, fonts and phrases which a project cover page must have.</li> <li>3. Students will be able to explain the specifications, fonts and phrases which a project contents page must have.</li> <li>4. Students will be able to explain the specifications, fonts and phrases which a project information page must have.</li> <li>5. Students will be able to explain the required qualifications and fonts of the name, subject and purpose of the project.</li> <li>6. Students will be able to explain the required qualifications and fonts of the tools and equipment to be utilized in the project.</li> <li>7. Students will be able to explain the project application stages and drawing types of schemes.</li> <li>8. Students will be able to explain the commenting of the project and how the project should be concluded.</li> <li>9. Students will be able to explain the determination of the references to be utilized in the project and determine how they should be written.</li> </ol>
<b>Learning Unit</b>	<b>The Preparation and Procurement of Project Materials and Equipment</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the necessary analysis of the circuits to be utilized in the project.</li> <li>2. Students will be able to list the materials to be utilized after project circuits analysis.</li> <li>3. Students will be able to list the equipment to be utilized after project circuits analysis.</li> <li>4. Students will be able to explain the procurement stages of project materials and equipment.</li> <li>5. Students will be able to perform the robustness tests of project materials and equipment.</li> </ol>
<b>Learning Unit</b>	<b>Preparation of Project Circuits and Interior Assembly</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the drawing method of printed circuits of the circuits of the project.</li> <li>2. Students will be able to perform the drawings of the circuits of the project on printed circuit boards.</li> <li>3. Students will be able to explain the processes of etching and drilling after etching.</li> <li>4. Students will be able to place the convenient circuit elements on printed circuit board and perform soldering afterwards.</li> <li>5. Students will be able to assemble the electric terminal and pins on inputs and outputs of printed circuit boards.</li> <li>6. Students will be able to perform the necessary tests of the circuits built on printed circuit boards.</li> </ol>
<b>Learning Unit</b>	<b>Preparation of Project Box and Assembly of Circuits</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the layout and assembly of the materials to be placed in project box.</li> <li>2. Students will be able to assemble the circuits to be placed in project box.</li> <li>3. Students will be able to build the cable connections of the elements in the project box to the circuits.</li> <li>4. Students will be able to build the necessary insulation in order to prevent electrical leakage inside project box.</li> <li>5. Students will be able to take necessary measures in order to ensure cooling inside the box.</li> <li>6. Students will be able to perform the necessary tests inside and outside the box.</li> </ol>
<b>Learning Unit</b>	<b>Project Software Operations</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to choose the convenient software and coding language to be utilized in the project.</li> <li>2. Students will be able to design flow charts of the software.</li> <li>3. Students will be able to design the main program part of the software.</li> <li>4. Students will be able to design the sub-program part of the software.</li> <li>5. Students will be able to code the programs on a convenient software.</li> <li>6. Students will be able to upload the program via proper devices and perform necessary post-upload tests.</li> <li>7. Students will be able to perform the tests of the program on hardware.</li> <li>8. Students will be able to perform trouble shooting on software and hardware.</li> </ol>
<b>Learning Unit</b>	<b>Startup of the Project and Its Final Tests</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to procure the hardware which is planned to be tried in the project.</li> <li>2. Students will be able to run the project without any equipment and perform necessary tests.</li> <li>3. Students will be able to run the project with additional equipment and perform necessary tests.</li> </ol>
<b>Learning Unit</b>	<b>Completing Project File</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assess the operations monthly and records in the file.</li> <li>2. Students will be able to write the results and assessments of the operations.</li> <li>3. Students will be able to add the pictures of the works performed into the file and comment on them.</li> <li>4. Students will be able to make up the deficiencies of the file and get the file ready to hand in.</li> </ol>
<b>Learning Unit</b>	<b>Preparing the Model and Poster of the Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the poster of the project on an A3 or bigger size of papers.</li> <li>2. Students will be able to prepare the model of the project on a convenient table.</li> <li>3. Students will be able to carry out necessary preparations to place the project poster and project model to the place to present.</li> </ol>
<b>Learning Unit</b>	<b>Preparation of Project Presentation and Presenting It</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of presentation software.</li> <li>2. Students will be able to explain the project designing processes on presentation software and present the project.</li> <li>3. Students will be able to prepare the place to present the project, locate the posters and models to an appropriate place and arrange the spot to perform the presentation.</li> <li>4. Students will be able to project the project presentation on a convenient surface and perform a demonstration by running the circuit on the model.</li> <li>5. Students will be able to carry out necessary operations after project presentation.</li> </ol>
<b>Learning Unit</b>	<b>Project Assessment</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to assess the one who designed the project.</li> <li>2. Students will be able to assess the group who created the project, the interaction, and the studies.</li> <li>3. Students will be able to assess the project as a whole.</li> </ol>



## INDUSTRIAL KITCHEN AND WASHERS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of industrial kitchen and washers under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 7

<b>Learning Unit</b>	<b>The Installation Convenience of Industrial Kitchens and Washers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to check the electricity installations of industrial kitchens and washers according to the project.</li><li>2. Students will be able to check the water installations of industrial kitchens and washers according to the project.</li><li>3. Students will be able to check the gas and steam installations of industrial kitchens and washers according to the project.</li></ol>
<b>Learning Unit</b>	<b>Industrial Kitchen Preliminary Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the installation, maintenance and repair of vegetable washing machines.</li><li>2. Students will be able to perform the installation, maintenance and repair of vegetable peeler machines.</li><li>3. Students will be able to perform the installation, maintenance and repair of vegetable cutting machines.</li><li>4. Students will be able to perform the installation, maintenance and repair of meat grinders.</li></ol>
<b>Learning Unit</b>	<b>Industrial Stoves and Ovens</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the installation, maintenance and repair of industrial gas stoves.</li><li>2. Students will be able to perform the installation, maintenance and repair of induction stoves.</li><li>3. Students will be able to perform the installation, maintenance and repair of convection electric ovens.</li><li>4. Students will be able to perform the installation, maintenance and repair of convection gas ovens.</li><li>5. Students will be able to perform the installation, maintenance and repair of combi ovens.</li></ol>
<b>Learning Unit</b>	<b>Industrial Washers and Drying Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the installation, maintenance and repair of industrial dishwashers.</li><li>2. Students will be able to perform the installation, maintenance and repair of industrial washing machines.</li><li>3. Students will be able to perform the installation, maintenance and repair of industrial drying machines.</li></ol>
<b>Learning Unit</b>	<b>Calendering Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to install calendering machines.</li><li>2. Students will be able to perform the maintenance and repair of calendering machines.</li></ol>
<b>Learning Unit</b>	<b>Industrial Refrigerating Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the installation, maintenance and repair of industrial refrigerators.</li><li>2. Students will be able to perform the installation, maintenance and repair of walk-in coolers.</li></ol>

	3. Students will be able to perform the installation, maintenance and repair of shock coolers.
--	--

## FAX MACHINES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of fax machines under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>The Installation of Fax Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the introduction of fax machines.</li> <li>2. Students will be able to perform the adjustments of fax machines.</li> </ol>
<b>Learning Unit</b>	<b>The Maintenance and Repair of Fax Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the periodical maintenance of fax machines.</li> <li>2. Students will be able to perform the troubleshooting of fax machines.</li> </ol>

## ACCESS CONTROL SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to installing access control systems under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Access Control Systems and Devices</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of the access tools of access control systems faultlessly.</li> <li>2. Students will be able to perform the installation of the detectors of access control systems faultlessly.</li> </ol>
<b>Learning Unit</b>	<b>The Assembly of Access Control System Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw the sketch of access control systems in accordance with drafting principles.</li> <li>2. Students will be able to build the panel connections faultlessly by taking into account that the panel of access control system is not mounted on an easily reachable location.</li> <li>3. Students will be able to encode the panels faultlessly by taking the coding stages of access control system panels into account.</li> <li>4. Students will be able to perform the installation of the access control systems faultlessly.</li> </ol>

## GSM TELEPHONES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the maintenance and repair of GSM telephones under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>The Basics of GSM Telephones</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to read the schemes of various cell phones.</li><li>2. Students will be able to explain the components of mobile phones.</li></ol>
<b>Learning Unit</b>	<b>Tools and Test Equipment</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to perform the opening and closing of the cases of various mobile phones.</li><li>2. Students will be able to test the mobile phone via digital radio communication test device.</li></ol>
<b>Learning Unit</b>	<b>Soldering Techniques in GSM Telephones</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to utilize the hand tools and accessories which are used for soldering.</li><li>2. Students will be able to explain the chemicals which are used in soldering processes.</li><li>3. Students will be able to perform the soldering operations of SMD components.</li></ol>
<b>Learning Unit</b>	<b>The Maintenance and Repair of GSM Telephones</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to fix hardware and mother board faults.</li><li>2. Students will be able to install applications to mobile phones.</li><li>3. Students will be able to perform the checks and tests of the device after maintenance and repair.</li></ol>

## COMMUNICATION NETWORK INFRASTRUCTURES

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building the network infrastructures of communication systems in compliance with the Regulation of Interior Electrical Installations under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Access Network</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to explain access network infrastructure.</li><li>2. Students will be able to perform the installation of access network peripherals.</li><li>3. Students will be able to perform the maintenance and repair of access networks.</li></ol>
<b>Learning Unit</b>	<b>Transmission Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to install transmission system equipment.</li><li>2. Students will be able to perform the maintenance of transmission systems.</li><li>3. Students will be able to perform the troubleshooting of transmission systems.</li></ol>

<b>Learning Unit</b>	<b>Base Station Installation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to plan the installation.</li> <li>2. Students will be able to install service rack.</li> <li>3. Students will be able to assemble the AC energy.</li> <li>4. Students will be able to assemble RF antenna and cables.</li> <li>5. Students will be able to assemble the BSS systems.</li> <li>6. Students will be able to perform the assembly check.</li> </ol>

## HYDRAULIC AND PNEUMATIC SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building hydraulic and pneumatic circuits under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Pneumatic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of pneumatic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of pneumatic circuits.</li> <li>3. Students will be able to perform pneumatic system set up.</li> </ol>
<b>Learning Unit</b>	<b>Electropneumatic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of electropneumatic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of electropneumatic circuits.</li> <li>3. Students will be able to install electropneumatic systems.</li> </ol>
<b>Learning Unit</b>	<b>Hydraulic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of hydraulic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of hydraulic systems.</li> <li>3. Students will be able to install hydraulic systems.</li> </ol>
<b>Learning Unit</b>	<b>Electrohydraulic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to prepare the circuit elements of electrohydraulic systems for utilization.</li> <li>2. Students will be able to perform the computer aided simulation of electrohydraulic systems.</li> <li>3. Students will be able to install electrohydraulic systems.</li> </ol>

## ADVANCED MICROCONTROLLER APPLICATIONS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to building advanced-level microcontroller circuits under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 7

<b>Learning Unit</b>	<b>Digital Applications with Microcontrollers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build chronometer circuits.</li> <li>2. Students will be able to build LED animation circuit.</li> <li>3. Students will be able to build the command circuit of RGB LED Straps.</li> <li>4. Students will be able to build LED the star and crescent circuit.</li> <li>5. Students will be able to build light effect circuit.</li> <li>6. Students will be able to build scrolling text circuit.</li> <li>7. Students will be able to build digital clock circuit.</li> <li>8. Students will be able to build propeller display circuit.</li> <li>9. Students will be able to build combination lock circuits.</li> <li>10. Students will be able to build traffic light circuits.</li> <li>11. Students will be able to build color detection circuits.</li> <li>12. Students will be able to build electric piano circuits.</li> <li>13. Students will be able to build clap switch lamp circuits.</li> <li>14. Students will be able to build digital calculator circuits.</li> <li>15. Students will be able to build electronic PLC circuits.</li> <li>16. Students will be able to carry out LCD applications.</li> </ol>
<b>Learning Unit</b>	<b>Analog Applications with Microcontrollers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build the motor speed control circuit.</li> <li>2. Students will be able to build digital thermometer circuit.</li> <li>3. Students will be able to build odometer circuits.</li> <li>4. Students will be able to build gas detector circuits.</li> <li>5. Students will be able to build digital voltmeter circuit.</li> </ol>

## DRAWINGS OF PANEL PROJECTS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing panel project drawing applications under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Controller Drawing Software Menus and Settings</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the installation and operation of controller drawing software.</li> <li>2. Students will be able to explain the working area of controller drawing software.</li> <li>3. Students will be able to explain the menus of controller drawing software.</li> <li>4. Students will be able to explain the toolbars of controller drawing software.</li> <li>5. Students will be able to explain the page settings of controller drawing software.</li> <li>6. Students will be able to explain the IEC symbols on controller drawing software.</li> <li>7. Students will be able to explain the operations of exporting the file, importing the file and printing the file.</li> <li>8. Students will be able to explain the reporting process on controller drawing software.</li> <li>9. Students will be able to explain the designing of macros, adding macros and creating material macros.</li> </ol>
<b>Learning Unit</b>	<b>Basic Operations on Controller Drawing Software</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the steps of creating a project and adding pages on the project.</li> <li>2. Students will be able to explain creating survey templates and page settings.</li> <li>3. Students will be able to explain the specifications of a black box.</li> <li>4. Students will be able to explain the steps of creating a bill of materials.</li> <li>5. Students will be able to explain the design of the table of contents.</li> <li>6. Students will be able to explain the design of terminal box chart.</li> <li>7. Students will be able to explain the design of cable chart.</li> <li>8. Students will be able to explain the design of shapes and performing the drawings of shapes.</li> <li>9. Students will be able to explain the process of dimensioning.</li> </ol>
<b>Learning Unit</b>	<b>Element Layout and Cable Connections on Controller Drawing Software</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the layout of devices and power sources on working area.</li> <li>2. Students will be able to explain the placement of contactor on working area.</li> <li>3. Students will be able to explain the placement of overcurrent relay on working area.</li> <li>4. Students will be able to explain the placement of motors on working area.</li> <li>5. Students will be able to explain the placement of buttons and breakers on working area.</li> <li>6. Students will be able to explain the placement and numbering of electric terminals on working area.</li> <li>7. Students will be able to explain the placement of cables between elements on working area.</li> <li>8. Students will be able to explain the arrest points between the connected conductors and the processes of cable joints on working area.</li> <li>9. Students will be able to design an example of control circuit on the software.</li> </ol>
<b>Learning Unit</b>	<b>Basic Control Circuit Drawings of Controller Drawing Software</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to draw control and power circuits of three-phase asynchronous motors.</li> <li>2. Students will be able to draw control and power circuits of PLC.</li> </ol>

## SOUND AND LIGHT SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of sound and light systems under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Amplifiers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to build amplifier circuit.</li> <li>2. Students will be able to build power amplifier circuit.</li> </ol>
<b>Learning Unit</b>	<b>Sound Systems</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to determine the devices and materials to be used in a sound system.</li> <li>2. Students will be able to assemble the sound systems.</li> <li>3. Students will be able to perform the troubleshooting of sound systems.</li> </ol>
<b>Learning Unit</b>	<b>Car Sound Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation and couplings of car sound systems.</li> <li>2. Students will be able to perform the placement of speakers and cables.</li> <li>3. Students will be able to perform the troubleshooting of car sound systems.</li> </ol>
<b>Learning Unit</b>	<b>Lighting Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the reconnaissance of the place to install lighting.</li> <li>2. Students will be able to determine the devices and materials to be used in a lighting system.</li> <li>3. Students will be able to perform the installation and adjustments of lighting systems.</li> <li>4. Students will be able to perform the troubleshooting of lighting systems.</li> </ol>

## **BASIC ROBOTIC APPLICATIONS**

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing basic robotic applications under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 7

<b>Learning Unit</b>	<b>Robotic Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the definition and specifications of robotic systems.</li> <li>2. Students will be able to explain the robot types used in robotic systems.</li> <li>3. Students will be able to explain the operation of robotic system.</li> <li>4. Students will be able to explain the mechanical parts used in robotic systems.</li> <li>5. Students will be able to explain the electrical parts used in robotic systems.</li> <li>6. Students will be able to explain the various accessories used in robotic systems.</li> <li>7. Students will be able to explain the features of the elements utilized in robotic systems.</li> </ol>
<b>Learning Unit</b>	<b>Microcontrollers and Their Hardware</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the features of microcontrollers.</li> <li>2. Students will be able to explain the types and hardware of microcontrollers.</li> </ol>
<b>Learning Unit</b>	<b>Coding Microcontrollers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the coding languages used in microcontrollers.</li> <li>2. Students will be able to code in various coding languages with microcontrollers.</li> </ol>

<b>Learning Unit</b>	<b>The Design and Assembly of Robotic System</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the project of robotic circuit.</li> <li>2. Students will be able to carry out the planning necessary for robotic circuits.</li> <li>3. Students will be able to prepare the printed circuit of robotic circuit.</li> <li>4. Students will be able to perform the assembly of the boards and materials of robotic circuit.</li> <li>5. Students will be able to install the software of robotic circuit into the microcontroller.</li> <li>6. Students will be able to perform the required tests of the robotic circuit after the assembly.</li> </ol>
<b>Learning Unit</b>	<b>Line Follower Robot Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the circuit of line follower robot.</li> <li>2. Students will be able to check the robustness of the materials of line follower robot circuit.</li> <li>3. Students will be able to prepare the printed circuit of line follower robot and assemble the materials.</li> <li>4. Students will be able to prepare and install the software to the line follower robot.</li> <li>5. Students will be able to perform the tests of line follower robot.</li> </ol>
<b>Learning Unit</b>	<b>Sumo Robot Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the circuit of sumo robot.</li> <li>2. Students will be able to check the robustness of the materials of sumo robot circuit.</li> <li>3. Students will be able to prepare the printed circuit of sumo robot and assemble the materials.</li> <li>4. Students will be able to prepare and install the software to the sumo robot.</li> <li>5. Students will be able to perform the tests of sumo robot.</li> </ol>
<b>Learning Unit</b>	<b>Hexapod Robot Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the circuit of hexapod robot.</li> <li>2. Students will be able to check the robustness of the materials of hexapod robot circuit.</li> <li>3. Students will be able to prepare the printed circuit of hexapod robot and assemble the materials.</li> <li>4. Students will be able to prepare and install the software to the hexapod robot.</li> <li>5. Students will be able to perform the tests of hexapod robot.</li> </ol>
<b>Learning Unit</b>	<b>Robotic Arm Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the project of robotic arm.</li> <li>2. Students will be able to check the robustness of the materials robotic arm project.</li> <li>3. Students will be able to prepare the project of robotic arm and assemble the materials.</li> <li>4. Students will be able to design the robotic arm project software and install it.</li> <li>5. Students will be able to run the tests of robotic arm project.</li> </ol>
<b>Learning Unit</b>	<b>Spider Robot Project</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to design the spider robot.</li> <li>2. Students will be able to check the robustness of the materials of spider robot.</li> <li>3. Students will be able to prepare the spider robot and assemble the materials.</li> <li>4. Students will be able to design the spider robot software and install it.</li> </ol>



	5. Students will be able to perform the tests of spider robot.
<b>Learning Unit</b>	<b>Various Robot Projects</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to carry out the project of remote control robot.</li> <li>2. Students will be able to carry out the project of obstacle avoiding robot.</li> <li>3. Students will be able to carry out the project of webcam carrying robot.</li> <li>4. Students will be able to carry out the project of light follower robot.</li> <li>5. Students will be able to carry out the project of computer aided robot.</li> <li>6. Students will be able to carry out the project of robot with direction control.</li> </ol>

## TRANSFORMER WINDING

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the winding and repair of transformers under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Single Phase Transformer Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unmount the faulty one phase transformer.</li> <li>2. Students will be able to perform the winding estimation of one phase transformer.</li> <li>3. Students will be able to wind the coils of one-phase transformer.</li> </ol>
<b>Learning Unit</b>	<b>Car Transformer Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unmount the faulty car transformer.</li> <li>2. Students will be able to perform the estimations of car transformer.</li> <li>3. Students will be able to wind the coils of car transformer.</li> </ol>
<b>Learning Unit</b>	<b>Three Phase Transformer Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to unmount the faulty three- phase transformer.</li> <li>2. Students will be able to perform the winding estimation of three-phase transformer.</li> <li>3. Students will be able to wind the coils of three-phase transformer.</li> </ol>
<b>Learning Unit</b>	<b>MV/HV Transformer Winding</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the estimation and winding of MV/HV transformers.</li> <li>2. Students will be able to perform the maintenance of MV/HV transformers.</li> </ol>

## CASH TILLS AND BILL COUNTERS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the installation, maintenance and repair of cash tills and bill counters under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>POS Cash Registers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the adjustments of POS cash registers.</li> <li>2. Students will be able to perform the troubleshooting of POS cash registers.</li> </ol>
<b>Learning Unit</b>	<b>Bill Counters</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the adjustments of bill counters.</li> <li>2. Students will be able to perform the troubleshooting of bill counters.</li> </ol>
<b>Learning Unit</b>	<b>Barcode Readers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of barcode readers.</li> <li>2. Students will be able to perform the installation of barcode printers.</li> </ol>
<b>Learning Unit</b>	<b>Labeling Machines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of labeling machines.</li> <li>2. Students will be able to fix the faults in labeling machines.</li> </ol>

## PRINTERS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the maintenance and repair of printers under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Dot Matrix Printers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of dot matrix printers.</li> <li>2. Students will be able to perform the troubleshooting of dot matrix printers.</li> </ol>
<b>Learning Unit</b>	<b>Inkjet Printers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of inkjet printers.</li> <li>2. Students will be able to perform the troubleshooting of inkjet printers.</li> </ol>
<b>Learning Unit</b>	<b>Laser Printers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of laser printers.</li> <li>2. Students will be able to perform the troubleshooting of laser printers.</li> </ol>
<b>Learning Unit</b>	<b>Multifunctional Printers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the installation of Multifunctional printers.</li> <li>2. Students will be able to perform the troubleshooting of Multifunctional printers.</li> </ol>

## HV SYSTEMS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to performing troubleshooting, maintenance and planning in high voltage installations in compliance with the regulations of Interior Electric Installations, Electric Heavy Current Installations, Groundings in Electric Installations and the law of occupational health and safety numbered 6331.

**Grade** : 11-12

**Weekly Course Hours** : 9

<b>Learning Unit</b>	<b>Occupational Safety in HV Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to take the required occupational safety measures in HV installations.</li> <li>2. Students will be able to utilize the occupational safety materials in HV installations in accordance with the technique.</li> </ol>
<b>Learning Unit</b>	<b>Distribution and Power Transformer</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the structure, types and operating principles of HV distribution transformers.</li> <li>2. Students will be able to explain the label information of HV distribution transformers.</li> <li>3. Students will be able to build the MV and LV end connections of HV distribution transformers.</li> <li>4. Students will be able to perform the troubleshooting, maintenance and repair of HV distribution transformers.</li> <li>5. Students will be able to check the robustness of HV installation windings via megger.</li> <li>6. Students will be able to take samples from the insulation oil of oil filled HV transformers and perform oil change or oil adding.</li> <li>7. Students will be able to perform the change of silicagel in HV distribution transformers.</li> <li>8. Students will be able to perform the change of arcing horn in HV distribution transformers.</li> <li>9. Students will be able to perform the stage adjustments in HV distribution transformers.</li> <li>10. Students will be able to detect LV unstable loads in the secondary circuit of HV distribution transformers.</li> </ol>
<b>Learning Unit</b>	<b>Disconnectors and Breakers in HV Distribution Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain disconnectors, their types and parts.</li> <li>2. Students will be able to perform selection according to the label information of disconnectors.</li> <li>3. Students will be able to perform the assembly and disassembly of disconnectors.</li> <li>4. Students will be able to list the points to be considered during switch on-off operations of disconnectors.</li> <li>5. Students will be able to perform the troubleshooting, maintenance and repair of disconnectors.</li> <li>6. Students will be able to explain breakers, their types and the function of their parts.</li> <li>7. Students will be able to perform the labeling and locking operations of disconnectors and breakers.</li> <li>8. Students will be able to explain the operating principles of breakers.</li> <li>9. Students will be able to perform selection according to the label information of breakers.</li> <li>10. Students will be able to perform switching on-off operations of breakers (according to the breaker symbols and process algorithm).</li> <li>11. Students will be able to perform the assembly and disassembly of breakers.</li> </ol>

	12. Students will be able to perform the troubleshooting, maintenance and repair of breakers.
<b>Learning Unit</b>	<b>Maneuvers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the work transfer, status check and the utilization of communication devices such as radio etc. to provide feedback.</li> <li>2. Students will be able to explain the types of maneuvers.</li> <li>3. Students will be able to perform the switching on-off maneuvers by reading the single line schemes of HV transformer center.</li> <li>4. Students will be able to perform the maneuvers of electricity cutting and providing in LV installations.</li> <li>5. Students will be able to take measures in case of feedback in transformer centers.</li> <li>6. Students will be able to perform the maneuvers of electricity cutting and providing in HV installations.</li> <li>7. Students will be able to perform the maneuvers of energy cutting/providing in distribution centers in stepdown transformer centers.</li> </ol>
<b>Learning Unit</b>	<b>Overhead Lines</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to take the precautions of working at heights on an electric post.</li> <li>2. Students will be able to choose the post connection elements.</li> <li>3. Students will be able to prepare the founding of the post and perform the erection of the post.</li> <li>4. Students will be able to join the conductors according to overhead lines conductor types.</li> <li>5. Students will be able to explain the structure, types and installation of insulators and joining the conductors to insulator.</li> <li>6. Students will be able to build the grounding of the posts according to the type of the post.</li> <li>7. Students will be able to explain how the energy transfer line becomes available for intervention by building local grounding.</li> <li>8. Students will be able to perform the periodic check, maintenance and repair of lines.</li> </ol>
<b>Learning Unit</b>	<b>Underground Cables and Joints</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the structure and types of underground cables.</li> <li>2. Students will be able to perform the laying of underground cables.</li> <li>3. Students will be able to join cables to the additional equipment of underground cables.</li> <li>4. Students will be able to perform the insulation tests of underground cables.</li> </ol>
<b>Learning Unit</b>	<b>Grounding in HV Installations</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the significance and purpose of groundings in HV installations.</li> <li>2. Students will be able to explain the types and functions of groundings in HV installations.</li> <li>3. Students will be able to build grounding with grounding elements by opening a proper pit in soil.</li> <li>4. Students will be able to build grounding systems in stepdown center, distribution center, transformer building and root buildings.</li> <li>5. Students will be able to measure the resistance in HV installations by using a measurement tool.</li> <li>6. Students will be able to build groundings in HV underground cable installations.</li> </ol>
<b>Learning Unit</b>	<b>Protection Relays</b>

<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the general reasons of the faults in electric systems.</li> <li>2. Students will be able to explain the usage area and purpose of protection relays.</li> <li>3. Students will be able to explain the structure, working and types of surge protection devices.</li> <li>4. Students will be able to perform the selection, installation and connection of surge protection devices.</li> <li>5. Students will be able to carry out the installation and build connections of the primary protection elements.</li> <li>6. Students will be able to carry out the installation and build connections of the secondary protection elements.</li> <li>7. Students will be able to carry out the installation and build connections of the own protections of transformer.</li> <li>8. Students will be able to carry out the installation and build connections of the overcurrent protection relays.</li> <li>9. Students will be able to carry out the installation and build connections of the soil overcurrent protection relays.</li> <li>10. Students will be able to carry out the installation and build connections of the differential protection relays.</li> </ol>
--------------------------	--

## SWITCHING AND AUTOMATION IN HV INSTALLATIONS

**Course Objectives** : The aim of this lesson is to provide the students with the knowledge and skills related to modular cells, switchyards, control panels, circuit breaker in high voltage installations and automation in HV installations in compliance with the regulations of Interior Electric Installations, Electric Heavy Current Installations, Groundings in Electric Installations and the law of occupational health and safety numbered 6331.

**Grade** : 11-12

**Weekly Course Hours** : 4

<b>Learning Unit</b>	<b>Metal Enclosed Modular Cells</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the parts and equipment of metal enclosed modular cells (MEMC).</li> <li>2. Students will be able to perform the installation of metal enclosed modular cells to its place.</li> <li>3. Students will be able to build the connections of metal enclosed modular cells.</li> </ol>
<b>Learning Unit</b>	<b>HV Switchyards and Control Panels</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the types and hardware of switchyards.</li> <li>2. Students will be able to explain the types and equipment of HV control panels.</li> </ol>
<b>Learning Unit</b>	<b>DC Sources in HV Installations and Their Usage Areas</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of DC power sources in HV installations.</li> <li>2. Students will be able to perform the connections, maintenance and repair of DC motors in HV installations.</li> </ol>
<b>Learning Unit</b>	<b>HV Circuit Breakers</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the structure and types of HV circuit breakers.</li> <li>2. Students will be able to assemble the HV circuit breakers.</li> <li>3. Students will be able to change the HV circuit breakers.</li> </ol>

<b>Learning Unit</b>	<b>Carrier Current and Scada Systems</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the maintenance and repair of carrier current systems.</li> <li>2. Students will be able to build network systems.</li> <li>3. Students will be able to use SCADA systems.</li> </ol>

## ESCALATOR WALKWAY SYSTEMS

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to performing the maintenance and repair of escalators and moving walkways under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Escalator and Moving Walkways Engine Room</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the general structure, operating and features of escalators and moving walkways.</li> <li>2. Students will be able to choose the parts of escalator and moving walkway.</li> <li>3. Students will be able to perform the check and change of the control circuit and elements of escalator and moving walkway.</li> <li>4. Students will be able to perform the check and change of the drive system elements of escalator and moving walkway.</li> </ol>
<b>Learning Unit</b>	<b>Switches of Escalators and Moving Walkways</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the check and change of limit switches and sensors.</li> <li>2. Students will be able to perform the check and change of engine break switch.</li> <li>3. Students will be able to perform the check and change of the comb switch of escalator and moving walkway.</li> <li>4. Students will be able to perform the check and change of the handrail entry switch of escalator and moving walkway.</li> <li>5. Students will be able to perform the check and change of the step safety switch of escalator and moving walkway.</li> </ol>
<b>Learning Unit</b>	<b>Interior Equipment of Escalators and Moving Walkways</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the check and change of escalator steps.</li> <li>2. Students will be able to perform the check and change of the handrails of escalator and moving walkway.</li> </ol>
<b>Learning Unit</b>	<b>Exterior Equipment of Escalators and Moving Walkways</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to perform the check and change of the track and track chain of escalator and moving walkway.</li> <li>2. Students will be able to perform the check and change of the plate parts of escalator and moving walkway.</li> <li>3. Students will be able to perform the checks of operation panel and traffic flow signs of escalators and moving walkways.</li> </ol>

## PROGRAMMING

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to basic algorithm, visual block programming, programming the devices which can form communication network and game programming.

**Grade** : 11-12

**Weekly Course Hours** : 3

<b>Learning Unit</b>	<b>Block Based Programming</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to explain the functions of a program that is presented in a block based programming tool.</li><li>2. Students will be able to design basic algorithms by using the right techniques on block based programming tool.</li><li>3. Students will be able to debug a program that is presented in a block based programming tool.</li><li>4. Students will be able to develop and arrange a program that is presented in a block based programming tool in accordance with the criteria given.</li><li>5. Students will be able to choose the most convenient decision structures in order to adapt an algorithm.</li><li>6. Students will be able to design an original project which involves all programming structures.</li></ol>
<b>Learning Unit</b>	<b>Internet of Things</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to explain the functions of circuit components.</li><li>2. Students will be able to design applications via block based programming tools.</li><li>3. Students will be able to code a program for the internet of things via coding language.</li><li>4. Students will be able to use the coding language on the microcontroller card hardware.</li><li>5. Students will be able to design a system by using Packet Tracer</li></ol>
<b>Learning Unit</b>	<b>Game Programming</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to carry out basic coding and user interaction processes.</li><li>2. Students will be able to edit characters and environment.</li><li>3. Students will be able to carry out animation and simulation processes.</li><li>4. Students will be able to publish the designed game after testing it.</li></ol>

## DIGITAL DESIGN

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to carrying out drawings in compliance with the drafting principles, printing out the designs which are prepared by making three dimensional designs on computer, designing and administrating a web site by using template web contents, and preparing animation under the occupational health and safety measures.

**Grade** : 11-12

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>Digital Design</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"><li>1. Students will be able to use design supporting tools.</li><li>2. Students will be able to insert shapes on working plane.</li></ol>

	<ol style="list-style-type: none"> <li>3. Students will be able to form new shapes by grouping the shapes.</li> <li>4. Students will be able to form a new shape by extracting another shape from a shape.</li> <li>5. Students will be able to form original shapes by using importing.</li> <li>6. Students will be able to export their designs for other applications or 3D printer.</li> </ol>
<b>Learning Unit</b>	<b>Ready-made Web Pages</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to install the content manager software and its add-ons.</li> <li>2. Students will be able to carry out the adjustments of web site on control panel.</li> <li>3. Students will be able to carry out content and category processes.</li> <li>4. Students will be able to carry out menu and page processes.</li> </ol>
<b>Learning Unit</b>	<b>Preparing Animation</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to adapt the working screen.</li> <li>2. Students will be able to insert the standard shapes into working plane.</li> <li>3. Students will be able to carry out processes on objects via designing tools.</li> <li>4. Students will be able to change the parametric features of the inserted shape.</li> <li>5. Students will be able to develop the inserted shapes by using modifying tools.</li> <li>6. Students will be able to add texture to the objects designed by using Material Editor.</li> <li>7. Students will be able to insert camera to the ongoing project to use in the animation.</li> <li>8. Students will be able to develop animations by using keyframes.</li> <li>9. Students will be able to render the project.</li> <li>10. Students will be able to explain the render tools.</li> </ol>

## **SOCIAL MEDIA**

**Course Objectives** : The aim of this course is to provide the students with the knowledge and the skills related to collecting the news messages on media, collecting the news about an institution and carrying out a public relations campaign, e-commerce applications, data analysis and graphics.

**Grade** : 11-12

**Weekly Course Hours** : 2

<b>Learning Unit</b>	<b>E-Commerce</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain basic terms about e-commerce.</li> <li>2. Students will be able to explain e-commerce types.</li> <li>3. Students will be able to list e-commerce marketing stages.</li> <li>4. Students will be able to explain the technical background and security factors required for e-commerce.</li> <li>5. Students will be able to follow legal regulations related to e-commerce.</li> </ol>
<b>Learning Unit</b>	<b>Social Media</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to share contents which are in compliance with ethical principles and fundamental rights and freedom, while using social media.</li> <li>2. Students will be able to use social media in accordance with the responsibilities of legal principles and without hiding their identity.</li> <li>3. Students will be able to protect themselves against cyber-violence</li> </ol>



	<p>while using social media.</p> <ol style="list-style-type: none"> <li>4. Students will be able to explain the necessity of digital brand management and digital transformation.</li> <li>5. Students will be able to explain social media tools.</li> <li>6. Students will be able to design content plans for social media platforms.</li> <li>7. Students will be able to carry out social media analysis and reports.</li> <li>8. Students will be able to plan and apply crisis communication campaign on social media.</li> </ol>
<b>Learning Unit</b>	<b>Data Analysis and Graphics</b>
<b>Learning Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to explain the terms of data and information.</li> <li>2. Students will be able to explain data types and data sources around them.</li> <li>3. Students will be able to collect data via data collecting tools and design dataset.</li> <li>4. Students will be able to prepare data on tables.</li> <li>5. Students will be able to recognize the types of graphs and choose the convenient graphs for their purpose.</li> <li>6. Students will be able to design data based graphs by utilizing data visualization tools.</li> </ol>

## 6.6. ELECTIVE COURSES

These are the courses which enable students to develop in the field they aim at and they tend to, to move on in several programs in accordance with their interests and wishes, and to develop their personal skills.

While selecting an elective course, other schedules which belong to the course, if there is any, follow an order and the courses which are required to be taken must be considered.

