MANİSA CELAL BAYAR ÜNİVERSİTESİ

MANİSA TEKNİK BİLİMLER MESLEK YÜKSEKOKULU
ELEKTRİK VE ENERJİ BÖLÜMÜ
ELEKTRİK PROGRAMI
2021 ÖĞRETİM PLANI (Birinci Öğretim)

1. Sınıf 1. Yarıyıl							
Türkçe/ İngilizce Ders Kodu	**Türkçe Ders Adı**	**İngilizce Ders Adı**	**T**	**U**	**S**	**K**	**AKTS**
ELK 1101	Elektrik Üretim, İletim ve Dağıtım	Electric Generation, Transmission and Distribution	3	0	3	3	4
ELK 1103	Doğru Akım Devreleri	Direct Current Circuits	3	1	4	4	5
ELK 1105	Meslek Etiği	Professional Ethic	1	0	1	1	1
ELK 1107	Mesleki Matematik 1	Professional Mathematics 1	2	0	2	2	3
ELK 1109	Elektrik ve Elektronik Ölçmeleri	Measurements of Electrical and Electronic	2	1	3	3	4
ELK 1111	Temel Elektronik	Basic Electronics	2	1	3	3	3
ELK 1113	Trafo ve Doğru Akım Makinaları	Transformer and Direct Current Machines	2	1	3	3	4
ELK 1001	**Teknik Seçmeli Dersler 1**	**Technical Electives 1**	**2**	**1**	**3**	**3**	**3**
ELK 1201	*Bilgi Teknolojileri*	Information Technologies	2	1	3	3	3
ELK 1203	*Bilgisayarla Programlama Teknolojileri*	Programming Technologies with Computer	2	1	3	3	3
ELK 1205	*Endüstriyel Robotlar*	Industrial Robots	2	1	3	3	3
ELK 1003	**Teknik Seçmeli Dersler 2**	**Technical Electives 2**	**2**	**0**	**2**	**2**	**3**
ELK 1207	*Arıza Analizi*	Fault Analysis	2	0	2	2	3
ELK 1209	*Enerji Verimliliği ve Yönetimi*	Energy Efficiency and Management	2	0	2	2	3
ELK 1211	*Ev Cihazları*	Home Devices	2	0	2	2	3
ELK 1213	*Optoelektronik*	Optoelectronics	2	0	2	2	3
		Toplam	**19**	**5**	**24**	**24**	**30**

1. Sınıf 2. Yarıyıl							
Türkçe/ İngilizce Ders Kodu	**Türkçe Ders Adı**	**İngilizce Ders Adı**	**T**	**U**	**S**	**K**	**AKTS**
ELK 1102	Alternatif Akım Devreleri	Alternative Current Circuits	3	0	3	3	5
ELK 1104	Asenkron ve Senkron Makinalar	Asynchronous and Synchronous Machines	2	1	3	3	4
ELK 1106	Mikrodenetleyiciler	Microcontrollers	3	1	4	4	5
ELK 1108	Mesleki Matematik 2	Professional Mathematics 2	2	0	2	2	2
ELK 1110	Sayısal Elektronik	Digital Electronics	2	1	3	3	4
ELK 1112	Sosyal Sorumluluk	Social Responsibility	1	0	1	1	1
ELK 1114	Tesisata Giriş	Introduction to Installation	2	0	2	2	2
ELK 1002	**Teknik Seçmeli Dersler 3**	**Technical Electives 3**	**3**	**1**	**4**	**4**	**5**
ELK 1202	*Bilgisayar Destekli Elektronik Devre Tasarımı*	Computer Aided Electronic Circuit Design	3	1	4	4	5
ELK 1204	*Sarım Tekniği*	Winding Techniques	3	1	4	4	5
ELK 1206	*Soğutma Tekniği ve Havalandırma*	Cooling Technique and Ventilation	3	1	4	4	5
ELK 1208	*Endüstriyel Elektronik*	Industrial Electronics	3	1	4	4	5
ELK 1210	*Bilgisayar Destekli Tasarım*	Computer Aided Design	3	1	4	4	5
ELK 1212	*Scada Sistemleri*	Scada Systems	3	1	4	4	5

MANİSA TEKNİK BİLİMLER MESLEK YÜKSEKOKULU
ELEKTRİK VE ENERJİ BÖLÜMÜ
ELEKTRİK PROGRAMI
2021 ÖĞRETİM PLANI (Birinci Öğretim)

ELK 1004	**Teknik Seçmeli Dersler 4**	**Technical Electives 4**	**2**	**0**	**2**	**2**	**2**
ELK 1214	*Sözleşme Keşif ve Planlama*	Contract Discovery and Planning	2	0	2	2	2
ELK 1216	*Teknoloji Yönetimi*	Technology Management	2	0	2	2	2
ELK 1218	*Nanoteknoloji ve Uygulamaları*	Nanotechnology and Applications	2	0	2	2	2
ELK 1220	*Aydınlatma Tekniği*	Illumination Techniques	2	0	2	2	2
		Toplamı	**20**	**4**	**24**	**24**	**30**

2. Sınıf 3. Yarıyıl							
Türkçe/ İngilizce Ders Kodu	**Türkçe Ders Adı**	**İngilizce Ders Adı**	**T**	**U**	**S**	**K**	**AKTS**
ELK 2101	Sensörler ve Transdüserler	Sensors and Transducers	1	1	2	2	3
ELK 2103	Araştırma Yöntem ve Teknikleri	Research Methods and Techniques	2	0	2	2	2
ELK 2105	Elektromekanik Kumanda Sistemleri	Electromechanical Control Systems	3	1	4	4	5
ELK 2107	Güç Elektroniği	Power Electronics	3	0	3	3	4
ELK 2109	Yenilenebilir Enerji Kaynakları	Renewable Energy Sources	2	0	2	2	2
ELK 2111	Programlanabilir Denetleyiciler	Programmable Controllers	3	1	4	4	5
ELK 2113	İş Sağlığı ve Güvenliği	Occupational Health and Safety	2	0	2	2	3
ELK 2003	**Teknik Seçmeli Dersler 5**	**Technical Electives 5**	**2**	**0**	**2**	**2**	**3**
ELK 2201	*Hidrolik Pnömatik*	Hydraulic Pneumatic	2	0	2	2	3
ELK 2207	*Mesleki Teknik Yöntemler*	Professional Technical Methods	2	0	2	2	3
ELK 2209	*Mesleki Yabancı Dil*	Professional Foreign Language	2	0	2	2	3
ELK 2211	*Özel Elektrik Makinaları*	Special Electric Machines	2	0	2	2	3
ELK 2213	*Pano Tasarım ve Montajı*	Panel Design and Installation	2	0	2	2	3
ELK 2215	*Tıbbi Elektronik*	Medical Electronics	2	0	2	2	3
ELK 2219	*Yüksek Gerilim Tekniği*	High Voltage Technique	2	0	2	2	3
ELK 2221	*Özel Tesisat*	Special Installation	2	0	2	2	3
ELK 2004	**Teknik Olmayan Seçmeli Dersler**	**Non-Technical Electives**	**2**	**0**	**2**	**2**	**3**
ELK 2203	*İşletme Yönetimi*	Business Administration	2	0	2	2	3
ELK 2205	*Kalite Güvencesi ve Standartlar*	Quality Assurance and Standards	2	0	2	2	3
ELK 2217	*İnovasyon Yönetimi*	Innovation Management	2	0	2	2	3
ELK 2223	*Girişimcilik*	Entrepreneurship	2	0	2	2	3
		Toplamı	**20**	**3**	**23**	**23**	**30**

Dr. Öğr. Üyesi Cihan Alp ŞAHİN

MANİSA TEKNİK BİLİMLER MESLEK YÜKSEKOKULU
ELEKTRİK VE ENERJİ BÖLÜMÜ
ELEKTRİK PROGRAMI
2021 ÖĞRETİM PLANI (Birinci Öğretim)

2. Sınıf 4. Yarıyıl							
Türkçe/ İngilizce Ders Kodu	**Türkçe Ders Adı**	**İngilizce Ders Adı**	**T**	**U**	**S**	**K**	**AKTS**
MYO 2002	İşletmede Mesleki Eğitim	Vocational Training in Workplace	5	0	5	4	18
AİT 2102	Atatürk İlkeleri ve İnkılap Tarihi	Atatürk's Principles and History of Revolution	4	0	4	4	4
TDL 2102	Türk Dili	Turkish Language	4	0	4	4	4
YDI 2102	Yabancı Dil	Foreing Language	4	0	4	4	4
		Toplamı	**17**	**0**	**17**	**16**	**30**
		Genel Toplam	**76**	**12**	**88**	**87**	**120**

T: Teori **U:** Uygulama **S:** Ders Saati **K:** Ulusal Kredi **AKTS:** Avrupa Kredi Transfer Sistemi

Dr. Öğr. Üyesi Cihan Alp ŞAHİN

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Electric Generation, Transmission and Distribution

General Description

Course Name	:	Electric Generation, Transmission and Distribution
Course Code	:	ELK 1101
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	4
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, the introduction of materials of all kinds of high-voltage networks, aimed to gain qualifications for the installation of the operations.
Course Contents	:	Poles, types, properties and assembly, Insulators, Transmission line conductors, power transmission lines, size and power transformers, switchgear systems, splitter and cutter.
Recommended or Required Reading	:	-- TOSUN, İ., (2007) Power transmission and distribution, Birsen Publications -- TURGUT, E., SELÇUK K., (2009), Electricity generation, transmission and distribution, Detay Publications, Ankara.
Planned Learning Activities and Teaching Methods	:	Face to face with the students in the class module, using the necessary course materials, discusses, power plants, power transmission lines, switchgear applications in areas carried out.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to recognize the resources that are used in the production of electrical energy

2 - To be able to know the types of electricity production plants

3 - To be able to recognize energy transmission and distribution network

4 - To be able to recognize the components used in overhead line route

5 - To be able to recognize Salt field and the substations and transmission lines: switching, metering and protection elements

Weekly Course Contents

Week 1	Theoretical	:	Get to know process of electric gaining. Understanding application importance in our Country.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Sources used in Electric producing and Station types: thermic, aero, steam and fuel oil Stations
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Sources used in Electric producing and Station types; hydraulics, nuclear,
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Comestible Sources used in Electric producing and Station types ; wind, sun, under soil, lake stations
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Distribution system in our Country, to acquaint about voltage value. Understanding the important factors on choosing the route in distribution lines
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Pylons used in energy distribution lines. Traverses (consoles) to get to know isolator, their types, specialties and making their choosing.
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Aero route conductive, classifying, specialties and their choosing
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Under soil cables specialties which used for distribution
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Specialties of Distribution transformers and transformer posting types
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Counting the needed power for transformer, transformer norm power choosing, transformer place choosing, counting compensation

	Practice :	
	Laboratory :	
Week 12	Theoretical :	Turn on and turn off Parts; distributors, power separator, current breaker, power switch
	Practice :	
	Laboratory :	
Week 13	Theoretical :	Safe parts; cutoff walls, OG/AG fuses, relays, protection wires.
	Practice :	
	Laboratory :	
Week 14	Theoretical :	Gauging parts, current and voltage Transformers, their choices, types. 1 and 3 phase active and reactive current meter
	Practice :	
	Laboratory :	
Week 15	Theoretical :	Gauging parts, current and voltage Transformers, their choices, types. 1 and 3 phase active and reactive current meter
	Practice :	
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Attending lectures	Yes	12	288,00
Application / Practice	Yes	5	25,00
Individual study before lecture	Yes	12	288,00
Individual study after lecture	Yes	12	288,00
Research presentation	Yes	6	36,00
Field study	Yes	12	144,00
Assignment	Yes	5	50,00
Total Hours			1120,00
ECTS			37,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	5	0	0	0	0	0	0	0
2	0	5	0	0	0	0	0	0	0
3	0	5	0	0	0	0	0	0	0
4	0	0	0	0	5	0	0	0	0

5	0	0	0	0	5	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Direct Current Circuits

General Description

Course Name	:	Direct Current Circuits
Course Code	:	ELK 1103
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, to be implement the principles of the electric current and to be make solutions of all the direct current electrical circuits qualifications are aimed to gain.
Course Contents	:	Static electric.Taking precautions against unforeseen effects of electric current. Physical and electrical definitions of resistance, Ohm's law. Ideal and real current and voltage sources. DC current circuit solutions. Electrical footprint of work, power, energy and efficiency. Equation derivation for and from meshed circuits for loop current, branch current and node voltage solving methods. Superposition, Thevenin's and Norton's theorems. Maximum power transfer theorem. Electrical and physical properties of capacitance and inductance as energy storing devices and their behaviors in series and paralel connections.
Recommended or Required Reading	:	Direct Current Circuits Analysis, Abdullah Görkem, Metin Kuş, Özkan Printing Industry, Ankara, 2004.
Planned Learning Activities and Teaching Methods	:	Theoretical description of the subjects, making practise and doing experiments at the laboratory.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to apply the basic principles of the electric current

2 - To be able to solve the basic circuit problems

3 - To be able to solve the complex circuit problems

4 - To be able to understand the effects of direct current circuit elements

Weekly Course Contents

Week 1	Theoretical	:	Static electric.Taking precautions against unforeseen effects of electric current.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Physical and electrical definitions of resistance, Ohm's law.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	DC current serial, paralel and serial-parallel circuit solutions.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	DC current serial, paralel and serial-parallel circuit solutions.
	Practice	:	DC current serial, paralel and serial-parallel circuit solutions.
	Laboratory	:	Measuring laboratory
Week 5	Theoretical	:	DC current serial, paralel and serial-parallel circuit solutions.
	Practice	:	DC current serial, paralel and serial-parallel circuit solutions.
	Laboratory	:	Measuring laboratory
Week 6	Theoretical	:	Electrical footprint of work, power, energy and efficiency.
	Practice	:	Electrical footprint of work, power, energy and efficiency.
	Laboratory	:	Measuring laboratory
Week 7	Theoretical	:	Equation derivation for and from meshed circuits for loop current and branch current solving methods.
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Loop current and node voltage solving methods
	Practice	:	Loop current and node voltage solving methods
	Laboratory	:	Measuring laboratory
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Superposition theorem.
	Practice	:	Superposition theorem.
	Laboratory	:	Measuring laboratory
Week 11	Theoretical	:	Thevenin's and Norton's theorems. Maximum power transfer theorem.
	Practice	:	Thevenin's and Norton's theorems. Maximum power transfer theorem.
	Laboratory	:	Measuring laboratory

Week 12	Theoretical	:	Direct current solution methods
	Practice	:	Direct current solution methods
	Laboratory	:	Measuring laboratory
Week 13	Theoretical	:	Maximum power transfer theorem.
	Practice	:	Maximum power transfer theorem.
	Laboratory	:	Measuring laboratory
Week 14	Theoretical	:	Electrical and physical properties of capacitance and inductance as energy storing devices
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Electrical and physical properties of capacitance and inductance as energy storing devices
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	56,00
Application / Practice	Yes	6	6,00
Laboratory	Yes	4	12,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	5,00
Preparation for final	Yes	1	5,00
Total Hours			142,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	1	1	0	1
2	1	1	2	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	2
4	1	2	0	1	2	1	1	2	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Professional Ethic

General Description

Course Name	:	Professional Ethic
Course Code	:	ELK 1105
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	1
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	1
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Gain skills to the students, working in accordance with ethical rules in business life
Course Contents	:	In this course students will learn ethical concept, ethical definition, moral development process, ethical rules, ethical systems, ethical relationship with society, ethical questioning, social corruption, professional ethics, ethics in business life, professional corruption.
Recommended or Required Reading	:	Occupational Ethics, Demet Çakıroğlu, Nuran Öztürk Başpınar, Nobel Academic Publication, 2011, Istanbul
Planned Learning Activities and Teaching Methods	:	Conferences, Applied Courses, Presentations, Seminars
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to having the knowledge and skills to provide suitable environment for work ethic at work

2 - To be able to develop positive ideas about the concept of ethics

3 - To be able to understand the principles of occupational ethics

4 - To be able to working in accordance with the work ethics required by the profession in the workplace environment

Weekly Course Contents

Week 1	Theoretical	Definition of ethics
	Practice	
	Laboratory	
Week 2	Theoretical	Moral Development process
	Practice	
	Laboratory	
Week 3	Theoretical	Ethical rules
	Practice	
	Laboratory	
Week 4	Theoretical	Ethical systems: Intended result Etic Rule of ethics
	Practice	
	Laboratory	
Week 5	Theoretical	Ethical systems: Social contract ethics Personal Ethics Social life ethic
	Practice	
	Laboratory	
Week 6	Theoretical	Relationship between ethic and society
	Practice	
	Laboratory	
Week 7	Theoretical	Consequences of acting in accordance with Ethical Values
	Practice	
	Laboratory	
Week 8	Theoretical	Midterm exam
	Practice	
	Laboratory	
Week 9	Theoretical	Ethical questioning
	Practice	
	Laboratory	
Week 10	Theoretical	Social corruption and varieties
	Practice	
	Laboratory	
Week 11	Theoretical	The concept of professional ethics
	Practice	
	Laboratory	
Week 12	Theoretical	Professional Ethics Principles: Accuracy legality Reliability Commitment to the Job

	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Ethical and non-ethical issues in business life
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Professional Corruption
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Consequences of appropriate behaviors in Work Ethics
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Assignment	Yes	14	14,00
Final	No	1	1,00
Attending lectures	Yes	14	14,00
Total Hours			30,00
ECTS			1,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	1	1	3	4
2	0	0	0	0	0	0	0	3	2
3	0	0	0	0	0	0	0	2	2
4	0	0	0	0	0	0	0	3	4

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Professional Mathematics 1

General Description

Course Name	:	Professional Mathematics 1
Course Code	:	ELK 1107
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Aim of this course is to teach adequate and efficient mathematics to create an infrastructure for students.
Course Contents	:	numbers, probability, algebra, geometry, trigonometry.
Recommended or Required Reading	:	Lecture notes Balcı M., Genel Matematik-1, Balcı Yayınları, 2008.
Planned Learning Activities and Teaching Methods	:	Lectures, Practical Courses, Presentation, Seminar, Project, Laboratory Applications (if necessary)
Recommended Optional Programme Components	:	-

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to solve applications of numbers and probability

2 - To be able to solve applications of algebra

3 - To be able to solve applications of geometry

4 - To be able to solve applications of trigonometry

Weekly Course Contents

Week 1	Theoretical	: numbers

	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	numbers
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	numbers
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	probability
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	probability
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	algebra
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	algebra
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	geometry
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	midterm
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	geometry
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	geometry
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	trigonometry
	Practice	:	
	Laboratory	:	

Week 13	Theoretical	:	trigonometry
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	trigonometry
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	trigonometry
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Individual study after lecture	Yes	5	80,00
Total Hours			82,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	4	2	0	0	0	0	0	0	0
2	4	2	3	3	2	2	2	2	0
3	0	0	0	3	0	2	2	0	0
4	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Measurements of Electrical and Electronic

General Description

Course Name	:	Measurements of Electrical and Electronic
Course Code	:	ELK 1109
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	4
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Being able to realize the definition of measurement, calibration and electrical standard units. Fundamental principles of measurement, types of measurement errors and being able to calculate error rates.
Course Contents	:	Measurement, Calibration, physical and electrical standard units and unit conversions. Fundamental principles of error, delay, effect. Classification and combination of errors. Measurable values of current, voltage and power. Instantaneous, average, maximum and effective values of the electrical measures. Definitions and measurements of active, reactive power. Moving coil meters and electrodynamic meters: general specifications; wattmeters, voltmeters, ammeters. Measurement of resistance, capacitance and inductance. Measurement with oscilloscope.
Recommended or Required Reading	:	-- ALACACI, M., (2003), Electrical-Electronic Measurements and Job Security. -- NACAR, M., (2012), Electric-Electronic Measurement Technique. -- ÖZDEMİR, A., (2010), Electric-Electronic Measurement -- BEREKET, M., TEKİN, E., (2010), Basic Electronics and Measurement (Application Book), Mavi Publications, İzmir.
Planned Learning Activities and Teaching Methods	:	Lectures, Practical Courses, Presentation, Seminar, Project, Laboratory Applications (if necessary)
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to comprehend the basic and derived units accepted by the international system (S.I.), the symbols and principles of measuring instruments.

2 - To be able to capability to apply the principle of using D.C. ampermeter and D.C. voltmeter. To be able to measuring resistance

3 - To be able to understand alternating current and alternating voltage measurement and working principles of related devices

4 - To be able to comprehend the principles of power and work measurement in electric circuits, to be able to measure with wattmeter and meters.

5 - To be able to recognize circuit elements and parameters in electrical-electronic circuits by various methods. To be able to measure by oscilloscope.

Weekly Course Contents

Week 1	Theoretical	:	Physical quantities, the physical size of the units of measure, measurement tools for physical quantities.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Physical quantities, the physical size of the units of measure, measurement tools for physical quantities.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Investigation of measurement devices principles, Learning of measurement devices symbols and working principles.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Presentation of measurement devices, measurement errors, and observation of device characteristics
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Presentation of DC Ammeter and Voltmeter, Learning of usages, making resistance measurement process, making practice about the topic
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Get to know about multimeters, learning of reading and using of analog and digital multimeters, making practice
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Measurement of AC current and voltage, and getting to know the devices about these topics and learning working principles, making practice
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	

Week 9	Theoretical	:	Presentation of measurement transformers, observation of current and voltage trs., learning of usage and reading with connection to these measurement devices.
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Comprehension of principles of power and work measurements in electrical circuits, making measurements with wattmeter and counters.
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Observation of frequency, power coefficient, cycle analysis and introducing of measurement devices, to learn usage of them by connecting to the circuit.
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Recogniziton of pens multimeters, environmental measuring devices, Gaussmeter, network analyzer, learning to connect and to use.
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Set up circuits about observed measurement devices and making some practice
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Learning of structure of oscilloscope and working principles and characteristics of them, Making calibration of Oscilloscope, measurement of AC and DC voltage.
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Measurement of phase difference, power, current using oscilloscope and making square wave tests, frequency using oscilloscope, making practice about topic.
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	13	26,00
Application / Practice	Yes	13	13,00
Individual study before lecture	Yes	13	26,00
Individual study after lecture	Yes	13	26,00
Individual study after Application / Practice	Yes	13	26,00
Assignment	Yes	1	1,00

Total Hours			120,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	3	5	5	5	5	5	4	0	0
3	3	2	3	3	5	4	5	0	0
4	5	5	5	4	3	3	4	0	0
5	5	5	4	5	3	5	3	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Basic Electronics

General Description

Course Name	:	Basic Electronics
Course Code	:	ELK 1111
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	With this course, students will be able to learn the basic elements of electronic circuits and build circuits, and compare input and output signals.
Course Contents	:	Diodes and diode types, 1 and 3 phase rectifier circuits, filter circuits, regulator circuits, transistors and transistor types, amplifier circuits.
Recommended or Required Reading	:	SELEK, H.S., (2011), Electronics-1 (Analog Electronics), Seçkin Publishing, Ankara. -- DEMİREL H., Temel Elektrik-Elektronik, Birsen Publishing. -- YARCI,, K, ÖZTÜRK, O., (2000), Temel Elektronik, Yüce Publishing, Istanbul. -- Analog Electronics H. Bayazıt -- Electronics T. Saya Electronics Analysis-Design H. Pastacı
Planned Learning Activities and Teaching Methods	:	Teaching theoretically in a classroom environment and practically in a laboratory environment
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to explain the PN junction

2 - To be able to explain the diode characteristics and catalog information

3 - To be able to set up single-phase rectifier, filter and regulator circuits

4 - To be able to use the transistor as a switch element

Weekly Course Contents

Week 1	Theoretical	:	Atomic information.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Diodes and single-phase rectification.
	Practice	:	Diode and capacitor robustness test. Diode characteristics.
	Laboratory	:	
Week 3	Theoretical	:	Filter and regulation.
	Practice	:	Zener diode characteristics.
	Laboratory	:	
Week 4	Theoretical	:	Three-phase rectification with diode.
	Practice	:	Setting up a three-phase rectifier.
	Laboratory	:	
Week 5	Theoretical	:	Diode types and applications.
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Structure and polarization of transistors.
	Practice	:	Transistor robustness test.
	Laboratory	:	
Week 7	Theoretical	:	Structure and polarization of transistors.
	Practice	:	Using a transistor as a switch.
	Laboratory	:	
Week 8	Theoretical	:	Midterm Exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Using a transistor as a switching element.
	Practice	:	Switching circuit with a transistor. Laboratory:
	Laboratory	:	
Week 10	Theoretical	:	Transistor amplifier circuits.
	Practice	:	Transistor amplifier circuit.
	Laboratory	:	
Week 11	Theoretical	:	Field effect transistor structure.
	Practice	:	Mosfet strength test.
	Laboratory	:	
Week 12	Theoretical	:	Field effect transistor structure.
	Practice	:	
	Laboratory	:	

	Theoretical	:	Using field effect transistors as a switching element.
Week 13	Practice	:	Using Mosfet as a switch.
	Laboratory	:	
	Theoretical	:	Transistor regulators.
Week 14	Practice	:	Transistor regulation
	Laboratory	:	
	Theoretical	:	Transistor regulators.
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Project	Yes	3	6,00
Final	No	1	1,00
Attending lectures	Yes	14	28,00
Application / Practice	Yes	14	14,00
Laboratory	Yes	14	14,00
Individual study before lecture	Yes	14	14,00
Individual study after lecture	Yes	14	14,00
Total Hours			92,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	4	0	0	0	4	0	0	0	0
2	4	0	0	0	4	0	0	0	0
3	4	0	0	0	4	0	0	0	0
4	4	0	0	0	4	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Transformer and Direct Current Machines

General Description

Course Name	:	Transformer and Direct Current Machines
Course Code	:	ELK 1113
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	4
Name of Lecturer	:	Instructor Osman DEMİRCİ
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, all ends of the transformer and the presence of direct current electrical machines, commissioning and operation of connected transactions are aimed to gain the qualifications.
Course Contents	:	Installing and running of DC generators. Installing and running of DC motors. Installing and running of Transformers.
Recommended or Required Reading	:	1 - Nurdan GÜZELBEYOĞLU "Electrical Machines I-II" ITU Publications. 2 - Adem ALTUNSAÇLI "Electrical Machines - I", 2003, Kahramanmaras, Turkey. 3 - Necati OĞUZ - Muhittin GÖKKAYA "Electrical Machines - I" MEB Publications. 4 - M. Adnan PEŞİNT - Abdullah Ürkmez "Electrical Machines - II" MEB Publications. 5 - Nurdan GÜZELBEYOĞLU "Electrical Machines I, II Solving Problems" - ITU Publications. 6 - Lecture notes.
Planned Learning Activities and Teaching Methods	:	Lecture notes and learning is provided by experimental studies in the laboratory.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to Installing and running of DC generators

2 - To be able to Installing and running of DC motors

3 - To be able to Installing and running of one phase transformers

4 - To be able to Installing and running of three phase transformers

Weekly Course Contents

Week 1	Theoretical	:	DC generators 1. Structure 2. Working patterns 3. Types 4. Excitation in direct current generators
	Practice	:	N/A
	Laboratory	:	N/A
Week 2	Theoretical	:	Direct Current Shunt generators and Its Characteristics 1. Empty work characteristic 2. Load characteristic
	Practice	:	N/A
	Laboratory	:	N/A
Week 3	Theoretical	:	Direct Current Series generators and Characteristics 1. Empty work characteristic 2. Load characteristic
	Practice	:	N/A
	Laboratory	:	N/A
Week 4	Theoretical	:	Direct Current Compunt generators and Its Characteristics 1. Empty work characteristic 2. Load characteristic 3. Rate Setting in Direct Current generators 4. Speed setting in direct current generators 5. Direct current dynamo drivers
	Practice	:	Direct Current Shunt generators and Its Characteristics 1. Empty work characteristic 2. Load characteristic Direct Current Series Stator and Characteristics 1. Empty work characteristic 2. Load characteristic Direct Current Compunt generators and Its Characteristics 1. Empty work characteristic 2. Load characteristic
	Laboratory	:	N/A
Week 5	Theoretical	:	DC Motors 1. Structure 2. Working patterns 3. Types 4. Excitation in DC motors Direct Current Shunt Motor and Its Characteristics 1. Empty work characteristic 2. Load characteristic
	Practice	:	N/A
	Laboratory	:	N/A
Week 6	Theoretical	:	Direct Current Series Motor and Its Characteristics 1. Empty work characteristic 2. Load characteristic Direct Current Shunt Motor and Its Characteristics 1. Empty work characteristic 2. Load characteristic
	Practice	:	N/A
	Laboratory	:	N/A
Week 7	Theoretical	:	Direct Current Compunt Motor and Its Characteristics 1. Empty work characteristic 2. Load characteristic
	Practice	:	N/A
	Laboratory	:	N/A
Week 8	Theoretical	:	Speed Setting in Direct Current Motors 1. Speed setting in DC motors 2. Direct current motor drives
	Practice	:	Direct Current Series Motor and Its Characteristics 1. Empty work characteristic 2. Load characteristic Direct Current Shunt Motor and Its Characteristics
	Laboratory	:	N/A
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	

Week 10	Theoretical	:	One-phase Transformers 1. Structure 2. Working patterns 3. Types
	Practice	:	N/A
	Laboratory	:	N/A
Week 11	Theoretical	:	4. One-phase Transformer construction calculation
	Practice	:	N/A
	Laboratory	:	N/A
Week 12	Theoretical	:	Characteristics of a single phase transformers 1. Empty work characteristic 2. Load characteristic
	Practice	:	Characteristics of a single phase transformers 1. Empty work characteristic 2. Load characteristic
	Laboratory	:	N/A
Week 13	Theoretical	:	Three phase transformers 1. Structure 2. Working patterns 3. Types
	Practice	:	N/A
	Laboratory	:	N/A
Week 14	Theoretical	:	4. Three-phase transformer construction calculation
	Practice	:	N/A
	Laboratory	:	N/A
Week 15	Theoretical	:	Characteristics of three-phase transformers 1. Empty work characteristic 2. Load characteristic
	Practice	:	Characteristics of three-phase transformers 1. Empty work characteristic 2. Load characteristic
	Laboratory	:	N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Application / Practice	Yes	4	16,00
Individual study before lecture	Yes	14	42,00
Individual study after lecture	Yes	14	42,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	10,00
Total Hours			122,00
ECTS			4,00

Program and Learning Outcomes Relations

1	2	3	4	5	6	7	8	9

1	5	0	0	0	0	0	0	0	0
2	0	4	0	4	0	0	0	0	0
3	0	0	3	0	0	0	0	0	0
4	3	4	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Information Technologies

General Description

Course Name	:	Information Technologies
Course Code	:	ELK 1201
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course aims to provide competencies related to self-development by using informatics facilities.
Course Contents	:	Basic Computer Knowledge, Internet and Internet browser, Office programs, e-mail management, forums, graphics, presentation preparation, introductory material preparation, worksheet, formulas and functions,
Recommended or Required Reading	:	Computer 2 Lecturer İsmail Sarı-Ömer Bağcı, Internet Programming 1 Ebubekir Yaşar-Turgut Özseven, Computer and Internet usage Hasan Çebi Bal
Planned Learning Activities and Teaching Methods	:	Applied Lessons, Presentations, Projects, Laboratory Applications
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - Knowing basic computer and internet information

2 - Being able to edit numerical data

3 - Being able to prepare a presentation with Powerpoint

4 - Being able to work in Word

Weekly Course Contents

Week 1	Theoretical	:	Basic Computer Knowledge
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Information about the internet and internet browsers
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Office programs, Word Interface, Text Operations,
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Text Settings in Word
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Paragraph Settings, Page View, Tables, Drawings
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	3D settings, operations on images
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	File operations, general applications
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Introduction to Excel
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Creating a formula
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Formula Applications
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Excel Cells, Data
	Practice	:	
	Laboratory	:	

	Theoretical	:	Formatting in Excel,
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Introduction to Power Point
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Preparing a Power Point Presentation
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	14,00
Application / Practice	Yes	14	14,00
Individual study before lecture	Yes	7	7,00
Individual study after lecture	Yes	7	7,00
Preparation for midterm	Yes	1	4,00
Preparation for final	Yes	1	4,00
Individual study after Application / Practice	Yes	14	14,00
Total Hours			66,00
ECTS			2,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	2	0	0	0	0	3	2	0	1
2	2	0	0	0	0	3	2	0	1
3	2	0	0	0	0	3	2	0	1
4	2	0	0	0	0	3	2	0	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Programming Technologies with Computer

General Description

Course Name	:	Programming Technologies with Computer
Course Code	:	ELK 1203
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This Course is designed to develop a broad knowledge of the concepts, principles, boundaries and scope of software development using an object oriented programming language. These will be reinforced by developing the practical skills required in using the structures and features of an object oriented programming language in the creation of software solutions to problems.
Course Contents	:	In the course there will be provided by developing the practical skills required in using the structures and features of an object oriented programming language in the creation of software solutions to problems.
Recommended or Required Reading	:	Visual Basic 6 Murat Taşbaşı
Planned Learning Activities and Teaching Methods	:	students, face to face, using the necessary course materials and applications are made in the computer laboratory.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to gain basic programming knowledge

2 - To be able to gain programming principles

3 - to be able to apply debugging methods

4 - To be able to use program loops.

Weekly Course Contents

Week 1	Theoretical	:	First step to Visual Basic
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	
	Practice	:	Usage of forms
	Laboratory	:	
Week 3	Theoretical	:	
	Practice	:	Constants, variables, operators
	Laboratory	:	
Week 4	Theoretical	:	
	Practice	:	Controls
	Laboratory	:	
Week 5	Theoretical	:	
	Practice	:	Usage of loops
	Laboratory	:	
Week 6	Theoretical	:	
	Practice	:	Usage of arrays
	Laboratory	:	
Week 7	Theoretical	:	
	Practice	:	Preparing menu and tool bar
	Laboratory	:	
Week 8	Theoretical	:	
	Practice	:	Usage of functions
	Laboratory	:	
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	
	Practice	:	Folder operations
	Laboratory	:	
Week 11	Theoretical	:	
	Practice	:	Error operations
	Laboratory	:	
Week 12	Theoretical	:	

	Practice	:	Database operations
	Laboratory	:	
	Theoretical	:	
Week 13	Practice	:	Database operations
	Laboratory	:	
	Theoretical	:	
Week 14	Practice	:	Database operations
	Laboratory	:	
	Theoretical	:	
Week 15	Practice	:	Database operations
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	2,00
Final	No	1	2,00
Individual study after lecture	Yes	10	120,00
Total Hours			124,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	2	2	3	4	0	0	0	0	0
2	2	2	3	4	0	0	0	0	0
3	2	2	3	4	0	0	0	0	0
4	2	2	3	4	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Industrial Robots

General Description

Course Name	:	Industrial Robots
Course Code	:	ELK 1205
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Aim of the course is to provide students with the basic definitions of robots, the basic analysis of robot arms motion and robot control
Course Contents	:	Basic Definition and Classifications of Robots, Mechanical Elements of Robots, Drive Systems, Robot Sensors, Kinematics and Kinetics of Robot Arm, Programming Robots
Recommended or Required Reading	:	1. Asfahl, C. Ray.,Robots and manufacturing automation. John Wiley, New York, 1992. 2. Hodges, B., İndustrial robotics, Heinemann Newnes, London, 1990.
Planned Learning Activities and Teaching Methods	:	Students, face to face, using the necessary course materials and applications are made in the computer laboratory
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to classificate the industrial robots.

2 - To be able to programing the industrial robots.

3 - To be able to renew the industrial robots.

4 - To be able to make the application with industrial robots.

5 - To be able to use the industrial robots in the field of Mechatronics Systems.

Weekly Course Contents

Week 1	Theoretical	Basic Definitions
	Practice	
	Laboratory	
Week 2	Theoretical	Classifications of Robots
	Practice	
	Laboratory	
Week 3	Theoretical	Robot Coordinate Systems
	Practice	
	Laboratory	
Week 4	Theoretical	Robot Drive Mechanisms
	Practice	
	Laboratory	
Week 5	Theoretical	End of Robot Arm Tooling
	Practice	
	Laboratory	
Week 6	Theoretical	Robot power systems
	Practice	
	Laboratory	
Week 7	Theoretical	Kinematics of Robot Arm Motion
	Practice	
	Laboratory	
Week 8	Theoretical	Kinetics of Robot Arm Motion
	Practice	
	Laboratory	
Week 9	Theoretical	Midterm exam
	Practice	
	Laboratory	
Week 10	Theoretical	Trajectory Generation in Robots
	Practice	
	Laboratory	
Week 11	Theoretical	Robot Control
	Practice	
	Laboratory	
Week 12	Theoretical	Robot Sensors

	Practice :	
	Laboratory :	
	Theoretical :	Programming in Robots
Week 13	Practice :	
	Laboratory :	
	Theoretical :	Robot Application
Week 14	Practice :	
	Laboratory :	
	Theoretical :	Robot Application
Week 15	Practice :	
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Individual study after lecture	Yes	8	80,00
Total Hours			82,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	3	0	2	0	0	4	0	0
2	0	3	0	2	0	0	4	0	0
3	0	3	0	2	0	0	4	0	0
4	0	3	0	2	0	0	4	0	0
5	0	3	0	2	0	0	4	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity

Fault Analysis

General Description

Course Name	:	Fault Analysis
Course Code	:	ELK 1207
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course is to gain knowledge and skills to make failure analysis
Course Contents	:	Fault isolation, fault unit or component, fault and maintenance cards, use catalogue, archiving
Recommended or Required Reading	:	1. Arslan A., Electrical household appliances repair and maintenance, 2008
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer,laboratory , group working
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to repair, definition to trouble by system analyses

2 - To be able to create to trouble and maintenance cards and to be able to use catalogue

3 - To be able to explain Electrical circuits and basic concepts related to failure

4 - To be able to do electrical and electronic components, electrical equipment and systems maintenance and repair work to do

Weekly Course Contents

Week 1	Theoretical	:	Failure isolation
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Failure isolation
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Find failure unit or component
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Find failure unit or component
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Find failure unit or component
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Find failure unit or component
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Find failure unit or component
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Failure and maintenance cards
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Failure and maintenance cards
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Use catalogue
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Use catalogue
	Practice	:	
	Laboratory	:	

	Theoretical	:	Archiving
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Archiving
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Archiving
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	42,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	5,00
Preparation for final	Yes	1	5,00
Total Hours			108,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	2	2	2	2	2	2	5	0	0
2	2	2	2	2	2	2	5	0	0
3	2	2	2	2	2	2	5	0	0
4	2	2	2	2	2	2	5	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Energy Efficiency and Management

General Description

Course Name	:	Energy Efficiency and Management
Course Code	:	ELK 1209
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Energy Efficiency Practices.
Course Contents	:	Energy saving and energy efficiency concepts. Areas of energy consumption in buildings; heating, Cooling, ventilation and lighting technics. The consumption of energy in buildings Examination of the first and second laws of thermodynamics; energy-exergy comparison; Energy requirement for heating and cooling in buildings. Energy in buildings International standards and experimental techniques related to productivity; applications. industry Living problems and solutions. In energy efficiency applications; Energy performance Agreement, measurement and verification, study standards, documentation and benchmarking.
Recommended or Required Reading	:	Analysis and Design of Energy Systems, B.K. Hodge, Robert P. Taylor, Third Edition, Prentice Hall, 1999. Energy Efficiency Manual, Donald R. Wulfinghoff, Energy Institute Press, 2011. Energy Saving and Renewable Energy Sources (TR), Yusuf Yaman, Seçkin Publishing,2007.
Planned Learning Activities and Teaching Methods	:	Lecture, question and answer, presentation
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to learn basic concepts and principles about Energy Efficiency Applications

2 - To be able to understand the importance of energy efficiency applications

3 - To be able to analyze Energy Efficiency in buildings

4 - To be able to make energy efficiency analysis

5 -

Weekly Course Contents			
Week 1	Theoretical	:	Energy saving and energy efficiency concepts
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Energy saving and energy efficiency concepts
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Energy consumption areas in buildings; Heating, cooling, ventilation and lighting techniques.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Energy consumption areas in buildings; Heating, cooling, ventilation and lighting techniques.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Inspection of energy consumption in the buildings in terms of first and second laws of thermodynamics; Energy exergy comparison
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Inspection of energy consumption in the buildings in terms of first and second laws of thermodynamics; Energy exergy comparison
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Energy requirements for heating and cooling in buildings
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Energy requirements for heating and cooling in buildings
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	International standards and testing techniques related to energy efficiency in buildings; applications
	Practice	:	
	Laboratory	:	

Week 11	Theoretical	:	International standards and testing techniques related to energy efficiency in buildings; applications
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Problems and solutions in the industry.
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	In energy efficiency applications; Energy performance agreement, measurement and verification, study standards, documentation and benchmarking
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	In energy efficiency applications; Energy performance agreement, measurement and verification, study standards, documentation and benchmarking
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	In energy efficiency applications; Energy performance agreement, measurement and verification, study standards, documentation and benchmarking
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Quizzes	Yes	3	18,00
Final	No	1	1,00
Attending lectures	Yes	15	45,00
Individual study before lecture	Yes	15	15,00
Individual study after lecture	Yes	15	15,00
Preparation for midterm	Yes	1	15,00
Preparation for final	Yes	1	15,00
Total Hours			125,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0

3	0	0	0	0	0	2	5	0	0
4	0	0	0	0	0	0	0	0	0
5	0	2	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Home Devices

General Description

Course Name	:	Home Devices
Course Code	:	ELK 1211
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Recognizing and repairing electrical equipment.
Course Contents	:	To recognize electrically operated heating elements. Cooker, electric stove, oven, iron, water heater, etc. To recognize the types of heating devices, air conditioners, hair dryers and electric cleaners. To examine the connections, maintenance and repair.
Recommended or Required Reading	:	Arçelik. AEG, Vestel Service books-catalog Arslan A. Repair and maintenance of electrical household appliances
Planned Learning Activities and Teaching Methods	:	
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - to able to electric heaters make witness and care

2 - to able to recognizes and maintains electric coolers

3 - to able to electric washers make witness and care

4 - to able to recognizes and cares for power tools

Weekly Course Contents

Week 1	Theoretical	Heating Elements, types and characteristics of presentation
	Practice	
	Laboratory	
Week 2	Theoretical	Preparation of Heater Elements
	Practice	
	Laboratory	
Week 3	Theoretical	Installation of heater element
	Practice	
	Laboratory	
Week 4	Theoretical	Measurement of heating element, experiment
	Practice	
	Laboratory	
Week 5	Theoretical	Electric stove, Oven, Presentation of stoves
	Practice	
	Laboratory	
Week 6	Theoretical	Electric stove, Oven, Faults and causes of stoves
	Practice	
	Laboratory	
Week 7	Theoretical	Introducing of Electric Power Boards, connection diagrams
	Practice	
	Laboratory	
Week 8	Theoretical	Mid-term exam
	Practice	
	Laboratory	
Week 9	Theoretical	Malfunctions and causes of electrical utilities, maintenance
	Practice	
	Laboratory	
Week 10	Theoretical	Introduction of Electric Shoehorns
	Practice	
	Laboratory	
Week 11	Theoretical	Electric Shoehorns, malfunctions and causes, maintenance
	Practice	
	Laboratory	
Week 12	Theoretical	Presentation of Electric Hair Drying Machines, connection diagrams
	Practice	
	Laboratory	

Week 13	Theoretical	:	Electric Hair Drying Machines, malfunctions and causes, maintenance
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Introduction of electric vacuum cleaners, connection diagrams
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Malfunctions and causes of electric vacuum cleaners, maintenance
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	28,00
Application / Practice	Yes	14	14,00
Individual study before lecture	Yes	14	14,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	2,00
Preparation for final	Yes	1	2,00
Assignment	Yes	7	21,00
Total Hours			111,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	2	2	0	3	3	3	0	0	0
2	2	2	0	3	3	3	0	0	0
3	2	2	0	3	3	3	0	0	0
4	2	2	0	3	3	3	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Optoelectronics

General Description

Course Name : Optoelectronics

Course Code : ELK 1213

Qualification Level : Short Cycle

Qualification Degree : PreBachelor Degree

Course Language : Turkish

Theoretical Credits : 2

Laboratory Credits : 0

Practice Credits : 0

ECTS : 3

Name of Lecturer : Assoc. Prof. Dr. Songül FİAT VAROL

Type of Course Unit : Optional

Mode of Delivery : Face-To-Face

Prequisite and Co-requisites : N/A

Objectives of the Course : The course aims to represent informations about optics, optoelectronics, optics band of the electromagnetic spectrum, the parameters and the components of the optoelectronic system and the scanning systems with their applications.

Course Contents : The solid state materials that is used in optoelectronics, the optical process of semi-conductors, absorption and radiation, transition rates and carrier life, principles of the led.

Recommended or Required Reading : 1. F.Özek, Optoelektonik , AÜFF Rotating Capital Enterprise publucations No:29,1995 2. E.Uiga ,Optoelectronics, Prentice Hall,Englewood Cliffs,N.J.,1995. 3. M.Tischler,Optoelectronics:Fiber Optics and Lasers,Macmillan/Mc Graw-Hill (Glencoe), Columbus,Ohio,1992 4. J.Wilson, J.F.B. Hawkes, Optoelectronics, Translations İbrahim Okur Değişim Publications Adapazarı 2000

Planned Learning Activities and Teaching Methods : 1: Lecture, 2: Group Study, 3: Problem Solving

Recommended Optional Programme Components : N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to define electromagnetic spectrum and semi-conductor photon sensors

2 - To be able to understand optical components

3 - To be able to understand optoelectronics

4 - To be able to understand optoelectronics devices and their working principles

Weekly Course Contents

Week 1	Theoretical	: Definition of the electromagnetic spectrum, semi-conductor photon sensors
	Practice	:
	Laboratory	:
Week 2	Theoretical	: Definition of the electromagnetic spectrum, semi-conductor photon sensors
	Practice	:
	Laboratory	:
Week 3	Theoretical	: Optics components
	Practice	:
	Laboratory	:
Week 4	Theoretical	: The optoelectronics
	Practice	:
	Laboratory	:
Week 5	Theoretical	: The optoelectronics
	Practice	:
	Laboratory	:
Week 6	Theoretical	: The electromagnetic spectrum, the effects of the atmosphere
	Practice	:
	Laboratory	:
Week 7	Theoretical	: The electromagnetic spectrum, the effects of the atmosphere
	Practice	:
	Laboratory	:
Week 8	Theoretical	: Night vision system, thermal camera, photometer
	Practice	:
	Laboratory	:
Week 9	Theoretical	: Midterm
	Practice	:
	Laboratory	:
Week 10	Theoretical	: Absorbent and reflector filters
	Practice	:
	Laboratory	:
Week 11	Theoretical	: Absorbent and reflector filters
	Practice	:
	Laboratory	:
Week 12	Theoretical	: Absorbent and reflector filters

	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	The parameters of the optical systems
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	The series and the parameters of the optoelectronic detectors
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	The series and the parameters of the optoelectronic detectors
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Individual study before lecture	Yes	9	36,00
Attending lectures	Yes	14	42,00
Assignment	Yes	3	9,00
Final	No	1	2,00
Midterms	Yes	1	2,00
Quizzes	Yes	2	4,00
Preparation for midterm	Yes	2	6,00
Preparation for final	Yes	2	6,00
Individual study after lecture	Yes	9	36,00
Preparation for quizzes	Yes	2	6,00
Homework	Yes	4	16,00
Total Hours			165,00
ECTS			6,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	1	0	0	0	0	0	0	0
2	3	0	0	0	0	0	0	0	0
3	3	0	0	0	2	0	0	0	0
4	1	4	1	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Alternative Current Circuits

General Description

Course Name : Alternative Current Circuits

Course Code : ELK 1102

Qualification Level : Short Cycle

Qualification Degree : PreBachelor Degree

Course Language : Turkish

Theoretical Credits : 3

Laboratory Credits : 0

Practice Credits : 0

ECTS : 5

Name of Lecturer : Instructor Osman GÜÇTEKİN

Type of Course Unit : Compulsory

Mode of Delivery : Face-To-Face

Prequisite and Co-requisites : N/A

Objectives of the Course : In this course, to be able to do calculations and solutions of alternative current (AC) circuits qualifications are aimed to gain.

Course Contents : AC Series and paralel circuits, resonance, power and compensation of AC circuits. Power and energy of mono phase and three phase systems AC circuits

Recommended or Required Reading : 1. AC Circuit Analysis, Hasan Selcuk Selek, Seckin Publications 2. AC Circuit Analysis, Murat Ceylan

Planned Learning Activities and Teaching Methods : Theoretical description of the subjects, making practise and doing experiments at the laboratory.

Recommended Optional Programme Components :

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to understand AC circuits basics.

2 - To be able to do solutions of AC circuits.

3 - To be able to do power and energy solutions of AC circuits.

4 - To be able to perform alternating current compensation calculations

Weekly Course Contents

Week 1 Theoretical : Alternative Current Sources

	Practice	:
	Laboratory	:
	Theoretical	: Alternative Current Features
Week 2	Practice	:
	Laboratory	:
	Theoretical	: Alternative Current Features
Week 3	Practice	:
	Laboratory	:
	Theoretical	: Resistance,Coil and Capacitor in Alternating Current Circuits,Series Circuit
Week 4	Practice	:
	Laboratory	:
	Theoretical	: Serial AC Circuits, Parallel AC Circuits
Week 5	Practice	:
	Laboratory	:
	Theoretical	: Parallel AC Circuits
Week 6	Practice	:
	Laboratory	:
	Theoretical	: Serial AC Rezonant Circuits.
Week 7	Practice	:
	Laboratory	:
	Theoretical	: Serial AC Rezonant Circuits.
Week 8	Practice	:
	Laboratory	:
	Theoretical	: Midterm exam
Week 9	Practice	:
	Laboratory	:
	Theoretical	: Parallel AC Rezonant Circuits.
Week 10	Practice	:
	Laboratory	:
	Theoretical	: Parallel AC Rezonant Circuits, Single-Phase AC Power and Energy.
Week 11	Practice	:
	Laboratory	:
	Theoretical	: Single-Phase AC Power and Energy.
Week 12	Practice	:
	Laboratory	:

Week 13	Theoretical	:	Three-Phase AC Power and Energy.
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Three-Phase AC Power and Energy, Alternative Current Power and Compensation
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Alternative Current Power and Compensation
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	56,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	56,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	10,00
Total Hours			162,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	1	1	0	1	2	1	1
2	2	1	1	1	1	1	1	2	1
3	1	1	0	1	1	1	0	1	1
4	1	0	1	1	1	1	1	1	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Asynchronous and Synchronous Machines

General Description

Course Name	:	Asynchronous and Synchronous Machines
Course Code	:	ELK 1104
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	4
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, all ends of the presence of asynchronous and synchronous electrical machines, commissioning and operation of connected transactions are aimed to gain the qualifications.
Course Contents	:	Ac Motors Installing and Running Generators to make and run the installation Synchronous Motor make and run the installation
Recommended or Required Reading	:	1. Nurdan GÜZELBEYOĞLU "Electrical Machines I-II" ITU Publications 2. A. Hamdi SAÇKAN "Electrical Machines - III," MEB Publications 3. M. Adnan PEŞİNT "Electrical Machines - IV" MEB Publications 4. Nurdan GÜZELBEYOĞLU "Electrical Machines I, II Solving Problems" - Mc Graw Hill 5. Ilhami ÇOLAK. 'Synchronous Machines' Nobel Publishing, 2002, Ankara, Turkey 6. Adem ALTUNSAÇLI, "Electric Machines 2", 2003, Kahramanmaras, Turkey.
Planned Learning Activities and Teaching Methods	:	Lecture notes and learning is provided by experimental studies in the laboratory.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to Run of the one-phase asynchronous motors.

2 - To be able to Run of the three-phase asynchronous motors.

3 - To be able to Run of the Synchronous generators (alternators),

4 - To be able to Run of the Synchronous motors.

Weekly Course Contents

Week 1	Theoretical	:	Run of the one-phase asynchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 2	Theoretical	:	Run of the one-phase asynchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 3	Theoretical	:	Run of the one-phase asynchronous motors.
	Practice	:	Run of the one-phase asynchronous motors.
	Laboratory	:	N/A
Week 4	Theoretical	:	Run of the three-phase asynchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 5	Theoretical	:	Run of the three-phase asynchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 6	Theoretical	:	Run of the three-phase asynchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 7	Theoretical	:	Run of the three-phase asynchronous motors.
	Practice	:	Run of the three-phase asynchronous motors.
	Laboratory	:	N/A
Week 8	Theoretical	:	Run of the Synchronous generators (alternators).
	Practice	:	N/A
	Laboratory	:	N/A
Week 9	Theoretical	:	Midterm exam.
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Run of the Synchronous generators (alternators).
	Practice	:	Run of the Synchronous generators (alternators).
	Laboratory	:	N/A
Week 11	Theoretical	:	Run of the Synchronous generators (alternators).
	Practice	:	Run of the Synchronous generators (alternators).
	Laboratory	:	N/A
Week 12	Theoretical	:	Run of the Synchronous motors.

	Practice	:	N/A
	Laboratory	:	N/A
Week 13	Theoretical	:	Run of the Synchronous motors.
	Practice	:	N/A
	Laboratory	:	N/A
Week 14	Theoretical	:	Run of the Synchronous motors.
	Practice	:	Run of the Synchronous motors.
	Laboratory	:	N/A
Week 15	Theoretical	:	Run of the Synchronous motors.
	Practice	:	Run of the Synchronous motors.
	Laboratory	:	N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Application / Practice	Yes	5	50,00
Individual study before lecture	Yes	10	30,00
Individual study after lecture	Yes	10	30,00
Preparation for midterm	Yes	1	9,00
Preparation for final	Yes	1	9,00
Total Hours			130,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	0	1	1	1
2	1	1	0	1	2	1	1	2	1
3	2	1	1	1	1	1	1	1	1
4	1	1	1	2	1	1	1	1	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Microcontrollers

General Description

Course Name	:	Microcontrollers
Course Code	:	ELK 1106
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Yalçın KANAT
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Providing basics of Advanced Microcontroller architecture and its peripheral devices, different interrupt resource usage, developing problem solving algorithms, improving the ability of multi-processor communication realization.
Course Contents	:	Advanced microcontroller architecture, peripheral devices (ADC,DAC,PWM,POR,TIC,EEPROM, SPI) and synchronous and asynchronous communication, Multi-processor network. Industrial application examples Various peripheral examples Project development and implementing a real system
Recommended or Required Reading	:	Arduino Coşkun Taşdemir Dikey eksen publishing 2011
Planned Learning Activities and Teaching Methods	:	Conferences, Applied Courses, Presentations, Seminars, Projects, Laboratory Applications
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to comprehension of advanced microcontroller architecture

2 - To be able to use new peripheral device

3 - To be able t comprehend code security

4 - To be able to improve ability of using the different interrupt resource

5 - To be able to improve the problem solving algorithms

6 - To be able to build synchronous asynchronous serial communication and Multi-processor network

7 - To be able to comprehen of signal converter and pulse width modulation

Weekly Course Contents

Week 1	Theoretical	Advanced microcontrollers architecture (ADUC841, intel-8051 based)
	Practice	
	Laboratory	
Week 2	Theoretical	Analog-Digital converter and their modes (ADC)
	Practice	
	Laboratory	
Week 3	Theoretical	Digital-Analog converter (DAC)
	Practice	
	Laboratory	
Week 4	Theoretical	Pulse width modulation peripheral device and their modes (PWM)
	Practice	
	Laboratory	
Week 5	Theoretical	Watchdog timer and software security
	Practice	
	Laboratory	
Week 6	Theoretical	Internal data memory and EEPROM usage
	Practice	
	Laboratory	
Week 7	Theoretical	Microcontroller programming in C
	Practice	
	Laboratory	
Week 8	Theoretical	Midterm exam
	Practice	
	Laboratory	
Week 9	Theoretical	Serial communication
	Practice	
	Laboratory	
Week 10	Theoretical	Serial communication
	Practice	
	Laboratory	
Week 11	Theoretical	Interrupt based programming
	Practice	
	Laboratory	

	Theoretical	:	
Week 12	Practice	:	ADC and DAC applications
	Laboratory	:	
	Theoretical	:	
Week 13	Practice	:	Step motor applications
	Laboratory	:	
	Theoretical	:	
Week 14	Practice	:	LCD display applications
	Laboratory	:	
	Theoretical	:	
Week 15	Practice	:	Timer and counter applications
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	2,00
Final	No	1	2,00
Attending lectures	Yes	14	42,00
Application / Practice	Yes	14	28,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	84,00
Preparation for midterm	Yes	1	3,00
Preparation for final	Yes	1	3,00
Total Hours			192,00
ECTS			6,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	5	5	5	5	0	0	0	0
2	4	5	5	5	5	0	0	0	0
3	4	5	5	5	4	0	0	0	0
4	4	5	5	5	4	0	0	0	0
5	5	5	5	5	5	5	0	0	0
6	4	5	5	5	5	5	0	0	0
7	4	5	5	5	5	5	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Professional Mathematics 2

General Description

Course Name	:	Professional Mathematics 2
Course Code	:	ELK 1108
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Students are reminded of the general subjects of mathematics and mathematical processes to gain practicality.
Recommended or Required Reading	:	Prepared lecture notes Basic math mathematics subject test books parsed narrative and questions
Course Contents	:	Solving systems of linear equations, matrix processing ability, limit and continuity understand to apply the rules of differentiation, with the help of integral calculus able to area and volume, simple differential equations, based on statistical definitions
Planned Learning Activities and Teaching Methods	:	Lecture, question-answer, problem-solving
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to Self-sufficiency and problem-solving basic math problems are encountered.

2 - To be able to Definition and Basic Concepts-Indefinite Integrals and Integral Constant c Solving for the Electrical and Physical Applications Examples

3 - To be able to Integration by Substitution and Partial Integral Learning Techniques

4 - To be able to Matrices, limit and continuity of teaching subjects

5 - To be able to The Definite Integral Assisted Area - Volume Account teach

Weekly Course Contents

Week 1	Theoretical	:	Systems of linear equations
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Matrices
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Matrix operations
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Limit
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Continuity
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Derivative
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Codes of derivative
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Mid-term exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Maximum and minimum problems
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Maximum and minimum problems
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Integration
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Rules of integration

	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Area and volume calculations
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Differential Equations
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Problem Solving
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	28,00
Individual study before lecture	Yes	2	20,00
Individual study after lecture	Yes	2	20,00
Preparation for midterm	Yes	1	1,00
Preparation for final	Yes	1	1,00
Total Hours			70,00
ECTS			2,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	2	1	2	1	1	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	2	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Digital Electronics

General Description

Course Name	:	Digital Electronics
Course Code	:	ELK 1110
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	4
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Giving students an understanding of what makes a system digital, basic properties of Boolean algebra, and the operation of discrete logic gates.
Course Contents	:	Number systems. Binary number system. Coding and codes. Logic elements and networks and their simplification. Truth tables and Boolean algebra, map and table methods for minimizing Boolean expressions. Karnough Maps. Logic design with gates, MSI and LSI technologies. Combinational logic, analysis and design. Principle and design of encoders, decoders, multiplexers, adders, arithmetic-logic units.
Recommended or Required Reading	:	[1] Mano Morris, Digital Design, Prentice Hall [2] Ekiz Huseyin, "Logic Circuits", Change Publications, 2005
Planned Learning Activities and Teaching Methods	:	Lectures, Practical Courses, Presentation, Seminar, Project, Laboratory Applications
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to understand analog and digital system, entities, what makes a system digital

2 - To be able to use binary, octal and hexedesimal numbering system

3 - To be able to comprehend coding systems and convertion of the coding systems

4 - To be able to understand basic properties of Boolean algebra

5 - To be able to understand the operation of discrete logic gates

6 - To be able to analyse and use Karnaugh maps to find minimal sum-of-products and products-of-sums expressions,

7 - To be able to understand characteristics of logic ICs. An ability to evaluate logic ICs using parameters. An ability to use digital displays..,

8 - To be able to analyze a combinational network using Boolean expressions and convert a verbal specification into a Boolean expression and then into digital circuits..,

9 - To be able to design logic circuits such as encoders, decoders..,

10 - To be able to design logic circuits such as multiplexers an demultiplexers

11 - To be able to design logic circuits such as adders, arithmetic-logic units,

Weekly Course Contents

Week 1	Theoretical	:	Analog and Digital Concept
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Numbering systems - Binary, octal and hexedesimal numbering system
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Coding and codes
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Truth tables and Boolean Algebra
	Practice	:	Aplication of logic gates
	Laboratory	:	Aplication of logic gates
Week 5	Theoretical	:	Logic design with gates,
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Karnough Maps
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Logic elements and networks and their simplification.
	Practice	:	Aplication of logic design
	Laboratory	:	Aplication of logic design
Week 8	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	MSI and LSI technologies
	Practice	:	
	Laboratory	:	

	Theoretical	:	
Week 10	Practice	:	Aplication of MSI and LSI technologies
	Laboratory	:	Aplication of MSI and LSI technologies
	Theoretical	:	
Week 11	Practice	:	Aplication of MSI and LSI technologies
	Laboratory	:	Aplication of MSI and LSI technologies
	Theoretical	:	Principle and design of encoders, decoders
Week 12	Practice	:	
	Laboratory	:	
	Theoretical	:	Demultiplexers Multiplexers - Data Selector
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	
Week 14	Practice	:	Application of Combinational Logic
	Laboratory	:	Application of Combinational Logic
	Theoretical	:	Adders, arithmetic-logic units
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	2,00
Final	No	1	2,00
Attending lectures	Yes	6	18,00
Application / Practice	Yes	4	12,00
Laboratory	Yes	4	12,00
Individual study before lecture	Yes	20	40,00
Individual study after lecture	Yes	10	20,00
Individual study after Application / Practice	Yes	4	4,00
Total Hours			110,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	3	0	0	4	0	0	0	0
2	5	3	0	0	4	0	0	0	0

3	5	3	0	0	4	0	0	0	0
4	5	3	0	0	4	0	0	0	0
5	5	3	0	0	4	0	0	0	0
6	5	3	0	0	4	0	0	0	0
7	5	3	0	0	4	0	0	0	0
8	5	3	0	0	4	0	0	0	0
9	5	3	0	0	4	0	0	0	0
10	5	3	0	0	4	0	0	0	0
11	5	3	0	0	4	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Social Responsibility

General Description

Course Name	:	Social Responsibility
Course Code	:	ELK 1112
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	1
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	1
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	It is expected from students to 1. identify environmental problems like social, natural, cultural and so on. 2. to develop interdisciplinary cooperation for the solution of the problem, 3. Continuity without compromising the process objective, 4. to share their results with the public.
Course Contents	:	In this course, students will learn about social responsibility concept, purpose and importance; The development of social responsibility in society; Civil society organizations and their places in social responsibility, social responsibility projects in the world and in Turkey.
Recommended or Required Reading	:	
Planned Learning Activities and Teaching Methods	:	Lecture, class discussion and application.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to identify problems that concern social life.

2 - To be able to produce solutions and projects to existing problems.

3 - To be able to make interdisciplinary studies.

4 - To be able to take responsibility in the social field.

Weekly Course Contents

Week 1	Theoretical :	Social Responsibility Concept, aim and importance
	Practice :	
	Laboratory :	
Week 2	Theoretical :	History of Social Responsibility
	Practice :	
	Laboratory :	
Week 3	Theoretical :	Development of Social Responsibility
	Practice :	
	Laboratory :	
Week 4	Theoretical :	Relationship between community and social responsibility
	Practice :	
	Laboratory :	
Week 5	Theoretical :	Relationship between individual and social responsibility
	Practice :	
	Laboratory :	
Week 6	Theoretical :	Concept of social responsibility on the basis of occupations Definition, mission and purpose of civil society organizations
	Practice :	
	Laboratory :	
Week 7	Theoretical :	Midterm-exam
	Practice :	
	Laboratory :	
Week 8	Theoretical :	Midterm-exam
	Practice :	
	Laboratory :	
Week 9	Theoretical :	Civil society organizations' place in social responsibility projects midterm
	Practice :	
	Laboratory :	
Week 10	Theoretical :	Social responsibility projects in the world and Turkey
	Practice :	
	Laboratory :	
Week 11	Theoretical :	Phantasmal phases of social responsibility projects
	Practice :	
	Laboratory :	
Week 12	Theoretical :	Identification of student projects

	Practice	:	
	Laboratory	:	
	Theoretical	:	
Week 13	Practice	:	Project presentations
	Laboratory	:	
	Theoretical	:	
Week 14	Practice	:	Project presentations
	Laboratory	:	
	Theoretical	:	Overview
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Assignment	Yes	4	20,00
Quizzes	Yes	1	5,00
Project	Yes	1	4,00
Final	No	1	1,00
Midterms	Yes	1	1,00
Total Hours			31,00
ECTS			1,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	2	3
2	0	0	0	0	0	0	0	2	4
3	0	0	0	0	0	0	0	2	3
4	0	0	0	0	0	0	0	2	3

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Introduction to Installation

General Description

Course Name	:	Introduction to Installation
Course Code	:	ELK 1114
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, low current, lighting and high-voltage current installations is to gain knowledge and skills to implement circuits.
Course Contents	:	Basic concepts of electrical network and facilities, conducting and insulating materials, Cable types and characteristics of the materials used in low-voltage installations and application circuits, lighting and receptacle circuit elements, the materials used in power installations, lighting and power installation accounts.
Recommended or Required Reading	:	- NACAR, M., (2003), Electricity Network and Facilities, Color Offset Printing, İskenderun. - Regulation on Electrical Internal Facilities (EMO Publications) TIRBEN, N., SUNGUROĞLU, C., ERKUŞ, A., ALAVURT, H., ŞENER, T., (1994), Department of Electrical and Electronics Engineering, Milli Eğitim Basımevi, İstanbul
Planned Learning Activities and Teaching Methods	:	Lectures, Practical Courses, Presentation, Seminar, Project, Laboratory Applications (if necessary)
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to select with the low current components and apply low current installation.

2 - To be able to select with the lighting components and apply lighting current installation.

3 - To be able to select with the High-voltage components and apply High-voltage installation.

Weekly Course Contents

Week 1	Theoretical	:	Conductors and Insulators
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Cable Laying Equipments and Characteristic : Installation tubes, arks, Wiring Ducts, conduit boxes, clips, cablo ties, spiral.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Low current equipments and Characteristic : transformers, door bells, button, entryphone, door openers, antenna.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	The main materials in the electrical circuit : fuse, generator, switch, receiver. Electrical circuit types : open circuit, close circuit, short circuit.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Application circuits of the low current wiring : door bell wiring, entryphone wiring, antenna wiring.
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Application circuits of the low current wiring : door bell wiring, entryphone wiring, antenna wiring.
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	The materials for lighting and power socket circuit : plugs, jack, power socket, lamp, lighting controlling materials.
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	mid-term exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Lighting line and lighting sortie, power socket line and power socket sortie.
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Lighting calculations based project.
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	High current systems and The materials in the high current systems.
	Practice	:	
	Laboratory	:	

Week 12	Theoretical	:	High current systems calculations based project.
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	High current systems calculations based project.
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Cable terminal cap and properties.
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Underground cable and properties.
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Application / Practice	Yes	12	144,00
Assignment	Yes	12	144,00
Attending lectures	Yes	14	588,00
Project	Yes	12	144,00
Workshop	Yes	12	144,00
Total Hours			1165,00
ECTS			39,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	5	5	0	0	0
2	0	0	0	0	5	5	0	0	0
3	0	0	0	0	5	5	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Computer Aided Electronic Circuit Design

General Description

Course Name	:	Computer Aided Electronic Circuit Design
Course Code	:	ELK 1202
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To be able to design of the electronic circuits and to prepare printing circuits of these designes with computer
Course Contents	:	To be able to design of the electronic circuits and to prepare printing circuits of these designes by using Proteus Isis and Proteus Ares programs
Recommended or Required Reading	:	Lecture notes
Planned Learning Activities and Teaching Methods	:	Lectures and practices
Recommended Optional Programme Components	:	N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make circuit drawing

2 - To be able to make circuit analysis

3 - To be able to prepare PCB layout

4 - to be able to Debug on the circuit

Weekly Course Contents

Week 1 : Theoretical : Installation and introduction of Isis and Ares programs

	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	Introducing the Isis program's menus and toolbars
Week 2	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	Selection of circuit elements and creation of simple circuits
Week 3	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	To construct schema of some industrial circuits and simulate them
Week 4	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	To measure the voltage or current amount during simulation
Week 5	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	To make a device using isis environment
Week 6	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	To define package and to make design of any package and using ares
Week 7	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	Midterm exam
Week 8	Practice	:	
	Laboratory	:	
	Theoretical	:	Transferring the created craft to the Proteus ARES program. Use of the ARES program.
Week 9	Practice	:	
	Laboratory	:	
	Theoretical	:	Transferring the created craft to the Proteus Ares program. Use of the ARES program.
Week 10	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	Package selection and preparation.
Week 11	Practice	:	Aplication of the lecture content
	Laboratory	:	
	Theoretical	:	Print circuit arrangement studies.
Week 12	Practice	:	Aplication of the lecture content
	Laboratory	:	

Week 13	Theoretical	:	Creation of vehicles using ISIS.
	Practice	:	Aplication of the lecture content
	Laboratory	:	
Week 14	Theoretical	:	Prepare a printed circuit board by printing using ISIS and ARES.
	Practice	:	Aplication of the lecture content
	Laboratory	:	
Week 15	Theoretical	:	Prepare a printed circuit board by printing using ISIS and ARES.
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Project	Yes	1	8,00
Final	No	1	1,00
Attending lectures	Yes	14	14,00
Application / Practice	Yes	14	28,00
Individual study before lecture	Yes	0	0,00
Individual study after lecture	Yes	14	56,00
Individual study after Application / Practice	Yes	0	0,00
Preparation for midterm	Yes	1	3,00
Preparation for final	Yes	1	3,00
Total Hours			114,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	2	2	2	5	0	3	0	0
2	3	2	2	2	5	0	2	0	0
3	3	2	2	2	5	0	3	0	0
4	3	2	2	2	5	0	3	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Winding Techniques

General Description

Course Name	:	Winding Techniques
Course Code	:	ELK 1204
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, made all kinds of direct and alternating current electric machines windings, start-up operations for connecting operation aimed to gain qualifications.
Course Contents	:	Done all kinds of direct and alternating current electric machines windings, commissioning operations run by connecting
Recommended or Required Reading	:	1.Görkem A., "Winding", Ankara, Turkey 2.Fırat A.Hikmet, "Winding Manual" 3.Anasız K. "Three-Phase Fractional Balanced windings" 4.Saçkan A.Hamdi "Electrical Machines - III," Ministry of Education Publications 5.Boduroğlu T. "Electric Machinery Courses" ITU Publications 6.Ceylan H. "Electric Workshop Winding" Supreme Publications 7.Gökkaya M., "A.Ç. Winding Technique Notes "G.Ü.Yayınları
Planned Learning Activities and Teaching Methods	:	face to face with students in the classroom, using the required course materials, is explained, was built in a workshop environment applications.
Recommended Optional Programme Components	:	Empty the stator, armature winding with the necessary tools and measuring instruments.

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make hand-winding of the AC machines

2 - To be able to make AC machines half-mold winding

3 - To be able to make AC machines Full-mold winding

4 - To be able to make Winding of DC machines

Weekly Course Contents

Week 1	Theoretical	:	To make Winding of DC machines
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	To make Winding of DC machines
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	To make Winding of DC machines
	Practice	:	To make Winding of DC machines
	Laboratory	:	
Week 4	Theoretical	:	To make hand-winding of the AC machines
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	To make hand-winding of the AC machines
	Practice	:	To make hand-winding of the AC machines
	Laboratory	:	
Week 6	Theoretical	:	To make hand-winding of the AC machines
	Practice	:	To make hand-winding of the AC machines
	Laboratory	:	
Week 7	Theoretical	:	To make hand-winding of the AC machines
	Practice	:	To make hand-winding of the AC machines
	Laboratory	:	
Week 8	Theoretical	:	To make AC machines half-mold winding
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Mid-term exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	To make AC machines half-mold winding
	Practice	:	To make AC machines half-mold winding
	Laboratory	:	
Week 11	Theoretical	:	To make AC machines half-mold winding
	Practice	:	To make AC machines half-mold winding
	Laboratory	:	
Week 12	Theoretical	:	To make AC machines half-mold winding

	Practice	:	To make AC machines half-mold winding
	Laboratory	:	
	Theoretical	:	To make AC machines Full-mold winding
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	To make AC machines Full-mold winding
Week 14	Practice	:	To make AC machines Full-mold winding
	Laboratory	:	
	Theoretical	:	To make AC machines Full-mold winding
Week 15	Practice	:	To make AC machines Full-mold winding
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Application / Practice	Yes	6	180,00
Individual study before lecture	Yes	14	588,00
Individual study after lecture	Yes	14	588,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	10,00
Total Hours			1377,00
ECTS			46,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	3	0	0	3	0	3	0	0
2	0	3	0	0	3	0	3	0	0
3	0	3	0	0	3	0	3	0	0
4	0	3	0	0	3	0	3	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Cooling Technique and Ventilation

General Description

Course Name	:	Cooling Technique and Ventilation
Course Code	:	ELK 1206
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Students taking this course, cold rooms, refrigeration and cooling used in the Ecowatt gain, condenser, evaporator, expansion valve cooling system equipment, such as the calculation of the power and capacity of the task the congress.
Course Contents	:	Importance of cooling, cooling needs, the development of cooling systems and cooling applications. Types of Cooling. Cooling load calculations. Selection of vapor-compression refrigeration system. other Examination of the cooling cycles. Electric defrost systems and cooling circuits. Refrigerants, methods of charging fluid, lubricating oils, refrigerants, and the environment.
Recommended or Required Reading	:	1. Applied Cooling Technique, Nuri Özkul, MMO Publications:115/8, Ankara, 2010. 2. Cooling Course Notes, Hüseyin Bulgurcu, Balıkesir University
Planned Learning Activities and Teaching Methods	:	1. Lecture Method 2. Case Study Method 3. Problem Solving Method 4. Discussion Method 5. demonstration Method
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ; 1 - Students taking this course, cold rooms, refrigeration and cooling used in the Ecowatt gain, condenser,

2 - To be able to detect defects in cooling systems

3 - To be able to maintenance and repair of cooling systems and elimination of failures

4 - To be able to economically operating cooling systems

Weekly Course Contents

Week 1	Theoretical	:	The aim of the course, the importance of cooling, achievement requirements, and cooling resources to be utilized introduction phase.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	To introduce basic concepts used in cooling.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Introduce the cooling.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Cooling cycles, thermodynamics of the evaporated cooling systems.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Introduction of refrigerants and refrigerant oils.
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Introduction of cooling devices and equipment.
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Introduce the electric circuit of the cooling system.
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Cooling load calculations.
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm Exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Cooling load calculations.
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Installation, operation, maintenance policy introduction
	Practice	:	
	Laboratory	:	

	Theoretical	:	Description of research topics in the cooling of the scene.
Week 12	Practice	:	
	Laboratory	:	
	Theoretical	:	Cooling equipment testing requirements, explain the research issues.
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Low temperature applications, explain the research issues.
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Low temperature applications, explain the research issues.
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Assignment	Yes	1	4,00
Final	No	1	1,00
Attending lectures	Yes	14	56,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	12,00
Individual study before lecture	Yes	14	42,00
Individual study after lecture	Yes	14	28,00
Total Hours			154,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	0	0	0	0	0	0	0	0
2	0	0	5	0	0	0	0	0	0
3	0	0	5	0	0	0	0	0	0
4	0	0	0	0	2	5	2	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Industrial Electronics

General Description

Course Name : Industrial Electronics

Course Code : ELK 1208

Qualification Level : Short Cycle

Qualification Degree : PreBachelor Degree

Course Language : Turkish

Theoretical Credits : 3

Laboratory Credits : 0

Practice Credits : 1

ECTS : 5

Name of Lecturer : Asst. Prof. Dr. Cihan Alp ŞAHİN

Type of Course Unit : Optional

Mode of Delivery : Face-To-Face

Prequisite and Co-requisites : N/A

Objectives of the Course :

Course Contents :

Recommended or Required Reading :

Planned Learning Activities and Teaching Methods :

Recommended Optional Programme Components :

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 -

2 -

3 -

4 -

5 -

6 -

Weekly Course Contents

Week 1	Theoretical	:
	Practice	:
	Laboratory	:
Week 2	Theoretical	:
	Practice	:
	Laboratory	:
Week 3	Theoretical	:
	Practice	:
	Laboratory	:
Week 4	Theoretical	:
	Practice	:
	Laboratory	:
Week 5	Theoretical	:
	Practice	:
	Laboratory	:
Week 6	Theoretical	:
	Practice	:
	Laboratory	:
Week 7	Theoretical	:
	Practice	:
	Laboratory	:
Week 8	Theoretical	:
	Practice	:
	Laboratory	:
Week 9	Theoretical	:
	Practice	:
	Laboratory	:
Week 10	Theoretical	:
	Practice	:
	Laboratory	:
Week 11	Theoretical	:
	Practice	:
	Laboratory	:
Week 12	Theoretical	:

	Practice	:
	Laboratory	:
	Theoretical	:
Week 13	Practice	:
	Laboratory	:
	Theoretical	:
Week 14	Practice	:
	Laboratory	:
	Theoretical	:
Week 15	Practice	:
	Laboratory	:

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	56,00
Individual study before lecture	Yes	14	56,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	2,00
Total Hours			144,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	4	1	0	3	2	4	0	0
2	3	4	1	0	3	2	4	0	0
3	3	4	1	0	3	2	4	0	0
4	3	4	1	0	3	2	4	0	0
5	3	4	1	0	3	2	4	0	0
6	3	4	1	0	3	2	4	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Computer Aided Design

General Description

Course Name	:	Computer Aided Design
Course Code	:	ELK 1210
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, be aimed to technical and professional computer-aided drawing knowledge and skills
Course Contents	:	Read architectural, electrical, mechanical projects, architectural, electrical, mechanical projects transfer to a computer, planning project, low-voltage installation projects draw on computer, lighting projects draw on computer, project calculations, power projects to draw on computer, facility projects in computer draw
Recommended or Required Reading	:	1. Electrical Installation Plans Contract Discovery and Planning, A. Doğru, M. Nacar, Has Ofset Publishing, 2009. 2. Electrical Technical Drawing (the Project), Mahmut Alacacı, Color Ofset Publishing, 2006
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer, laboratory, group working
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to technical drawing, writing in the norm

2 - To be able to computer-aided make basic geometric drawings

3 - To be able to draw architectural project for electrical installation project

4 - To be able to draw electrical installation project with computer programs

Weekly Course Contents

Week 1	Theoretical	:	Reading architectural, electrical, mechanical projects
	Practice	:	N/A
	Laboratory	:	N/A
Week 2	Theoretical	:	Electrical, mechanical projects transfer to a computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 3	Theoretical	:	Planning project
	Practice	:	N/A
	Laboratory	:	N/A
Week 4	Theoretical	:	Low-voltage installation projects draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 5	Theoretical	:	Low-voltage installation projects draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 6	Theoretical	:	Low-voltage installation projects draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 7	Theoretical	:	Lighting projects draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 8	Theoretical	:	Lighting projects draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 9	Theoretical	:	Midterm Exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Project calculations
	Practice	:	N/A
	Laboratory	:	N/A
Week 11	Theoretical	:	Power projects to draw on computer
	Practice	:	N/A
	Laboratory	:	N/A
Week 12	Theoretical	:	Power projects to draw on computer

Practice : N/A
Laboratory : N/A

Week 13
Theoretical : Facility projects in computer draw
Practice : N/A
Laboratory : N/A

Week 14
Theoretical : Facility projects in computer draw
Practice : N/A
Laboratory : N/A

Week 15
Theoretical : Facility projects in computer draw
Practice : N/A
Laboratory : N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	42,00
Individual study before lecture	Yes	14	42,00
Individual study after lecture	Yes	14	42,00
Preparation for midterm	Yes	1	3,00
Preparation for final	Yes	1	3,00
Total Hours			132,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	0	0	0	0	0	5	5	0	0
2	0	0	0	0	0	5	5	0	0
3	0	0	0	0	0	5	5	0	0
4	0	0	0	0	0	5	5	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Scada Systems

General Description

Course Name	:	Scada Systems
Course Code	:	ELK 1212
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course is intended to acquire the competencies of Te, Scada system setup and record keeping processes.
Course Contents	:	1. Practice with the Scada program 2. Designing a Scada 3. Visual programming 4. Scada application with visual programming
Recommended or Required Reading	:	1.Scada Programming with WinCC Flexible with Operator Panel and Wincc,Yavuz Eminoğlu, ,BİRSEN PUBLISHER,2014. 2.Operator Panel and Scada Programming with TIA Portal,Yavuz Eminoğlu, ,BİRSEN PUBLISHER,2016.
Planned Learning Activities and Teaching Methods	:	Expression Demonstration Laboratory Excercises
Recommended Optional Programme Components	:	Having a Programmable Controllers Course.

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to application with SCADA programs

2 - To be able to design a scada interface for a system.

3 - To be able to provide communication and communication between the Scada and the device

4 - To be able to Designof the SCADA user interface

Weekly Course Contents

	Theoretical	:	Installation of Scada Programs
Week 1	Practice	:	Performing the Setup of Scada Programs
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Control Device Connection with Scada Program Scada Interface Design
Week 2	Practice	:	Communication between the program and the device
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Using OPC SERVER
Week 3	Practice	:	
	Laboratory	:	
	Theoretical	:	Using OPC SERVER
Week 4	Practice	:	Creating a TAG List
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Making the ALARM HANDLING, Registration to Database
Week 5	Practice	:	To create alarm tags in the program
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Registration to Database
Week 6	Practice	:	To record the resulting alarms
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Visual Programming Program
Week 7	Practice	:	Visual Programming Program
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Visual Programming Objects
Week 8	Practice	:	Creating a simple level project
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Midterm
Week 9	Practice	:	
	Laboratory	:	
	Theoretical	:	Visual Programming Objects
Week 10	Practice	:	Creating an analog valued project 31/5000 Creating an analog value project
	Laboratory	:	Control and Automation Laboratory
	Theoretical	:	Computer Ports with Visual Programming
Week 11	Practice	:	
	Laboratory	:	
	Theoretical	:	Computer Ports with Visual Programming
Week 12	Practice	:	
	Laboratory	:	

Week 13	Theoretical	:	Instrument Control with Visual Programming Language
	Practice	:	Instrument Control with Visual Programming Language
	Laboratory	:	Control and Automation Laboratory
Week 14	Theoretical	:	Data Monitoring and Registration with Visual Programming
	Practice	:	Data Monitoring and Registration with Visual Programming
	Laboratory	:	Control and Automation Laboratory
Week 15	Theoretical	:	Data Monitoring and Registration with Visual Programming
	Practice	:	Data Monitoring and Registration with Visual Programming
	Laboratory	:	Control and Automation Laboratory

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	4,00
Assignment	Yes	10	40,00
Final	No	1	4,00
Laboratory	Yes	5	20,00
Individual study before lecture	Yes	0	0,00
Individual study after lecture	Yes	0	0,00
Preparation for midterm	Yes	1	30,00
Preparation for final	Yes	1	45,00
Total Hours			143,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	4	0	4	5	0	0
2	0	0	0	4	0	4	5	0	0
3	0	0	0	4	0	4	5	0	0
4	0	0	0	4	0	4	5	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Contract Discovery and Planning

General Description

Course Name	:	Contract Discovery and Planning
Course Code	:	ELK 1214
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, the student's pre-project studies , planning, reconnoitre, preparation of contract and specifications aimed to gain qualifications
Course Contents	:	Electrical installations of buildings,Internal hardware status, overhead lines, The underground cable facilities, Security systems planning, Assembly / disassembly of discovery and planning,Removing the project bill, Procurement rules and procedures, Individual subscribers, Private subscribers, TUS, Contractor contracts, Edit Record ,The minutes of the sample
Recommended or Required Reading	:	1. Doğru A. ,Electrical Installation Plans, Contract Discovery and Planning, Has Ofset, 2004 in Turkish
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer, group working
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make preliminary studies

2 - To be able to make planning

3 - To be able to make contract

4 - To be able to prepare specification

5 - To be able to provide tender documents

Weekly Course Contents

Week 1	Theoretical	Building regulations, energy feeds/ reconnoitre
	Practice	
	Laboratory	
Week 2	Theoretical	Specifications, overhead lines
	Practice	
	Laboratory	
Week 3	Theoretical	Overhead lines specifications, Topographic structure
	Practice	
	Laboratory	
Week 4	Theoretical	The underground cable facilities , regulations and specification
	Practice	
	Laboratory	
Week 5	Theoretical	Security systems / facilities and hardware information
	Practice	
	Laboratory	
Week 6	Theoretical	Security system regulation / assembly pre-planning
	Practice	
	Laboratory	
Week 7	Theoretical	Assembly / disassembly of discovery and planning
	Practice	
	Laboratory	
Week 8	Theoretical	Prepare the tender specifications
	Practice	
	Laboratory	
Week 9	Theoretical	Midterm Exam
	Practice	
	Laboratory	
Week 10	Theoretical	Prepare the tender documents
	Practice	
	Laboratory	
Week 11	Theoretical	Prepare the tender documents / operations Individual customers
	Practice	
	Laboratory	
Week 12	Theoretical	Operations Individual customers/ TUS contract

	Practice :	
	Laboratory :	
	Theoretical :	Contractor agreement
Week 13	Practice :	
	Laboratory :	
	Theoretical :	Contractor agreement / report preparation methods and procedures
Week 14	Practice :	
	Laboratory :	
	Theoretical :	Contractor agreement / report preparation methods and procedures
Week 15	Practice :	
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	196,00
Individual study before lecture	Yes	14	196,00
Individual study after lecture	Yes	14	196,00
Preparation for midterm	Yes	1	5,00
Preparation for final	Yes	1	5,00
Total Hours			598,00
ECTS			20,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	0	0	0	0	0	5	5	0	0
2	0	0	0	0	0	5	5	0	0
3	0	0	0	0	0	5	5	0	0
4	0	0	0	0	0	5	5	0	0
5	0	0	0	0	0	5	5	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity Technology Management

General Description

Course Name	:	Technology Management
Course Code	:	ELK 1216
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To have a comprehensive and interpretive knowledge of the methods and models used in technology management.
Course Contents	:	Technology management, globalization and global competition, synchronous engineering, change engineering, technology forecasting and planning, technology transfer.
Recommended or Required Reading	:	Technology Management, Dora Publishing ,2010, Articles related to weekly objects.
Planned Learning Activities and Teaching Methods	:	Lecture, question and answer, case studies, classroom discussions, success stories
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to define the basic concepts related to technology and technology management

2 - To be able to have knowledge about global change and change management

3 - To be able to develope knowledge and skills to adapt to rapidly changing technological environment and to find ways to improve current knowledge, continuously.

4 - To be able to identify the factors that are effective in technology transfer.

Weekly Course Contents

Week 1	Theoretical	:	Introducing course content and general evaluation
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Technology concept, technological development, technology and employment, technology and planning
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Technology management
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Globalization
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Global competition and technology management
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Technology management and change
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Simultaneous engineering
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Change engineering
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Technological innovation and advanced technology management
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Technology forecasting and planning
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Technology transfer
	Practice	:	

	Laboratory	:
Week 13	Theoretical	: Technology transfer methods
	Practice	:
	Laboratory	:
Week 14	Theoretical	: Technology transfer management Students presentations
	Practice	:
	Laboratory	:
Week 15	Theoretical	: Green technology Students presentations
	Practice	:
	Laboratory	:

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	15	30,00
Research presentation	Yes	1	1,00
Individual study before lecture	Yes	15	30,00
Individual study after lecture	Yes	15	30,00
Preparation for midterm	Yes	1	1,00
Preparation for final	Yes	1	1,00
Total Hours			95,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	4	1	0	0	0	0	0	0
2	1	1	0	0	0	0	0	0	0
3	1	3	2	3	3	0	0	0	0
4	1	2	4	4	5	5	4	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Nanotechnology and Applications

General Description

Course Name	:	Nanotechnology and Applications
Course Code	:	ELK 1218
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Giving to students the concept of nanotechnology in chemistry, giving information about the designing of nanomaterials and the application of nanotechnology to different disciplines.
Course Contents	:	In this course, detailed information about nanotechnology concept and nanomaterials will be given. Applications of nanotechnology in different fields, especially in electronics, will be explained.
Recommended or Required Reading	:	1. M.F. Ashby, P.J. Ferreira, D.L. Schodek. Nanomaterials, Nanotechnologies and Design, Elsevier, 2009, China. 2. K.T. Ramesh. Nanomaterials, Mechanics and Mechanisms, Springer, 2009, New York.
Planned Learning Activities and Teaching Methods	:	Classical and computer aided teaching method.
Recommended Optional Programme Components	:	-

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to comprehend the nano-size measurement

2 - To be able to understand the advantages of nanotechnology over other technologies

3 - To be able to use nanotechnology in the construction of different materials and composites

4 - To be able to understand the reactions in materials with nanomorphology

5 - To be able to comprehend the effect of nanotechnological products on daily life

Weekly Course Contents

Week 1	Theoretical	: Introduction to Nanotechnology Introduction and Dimension Concept
	Practice	:
	Laboratory	:
Week 2	Theoretical	: Introduction to Nanotechnology and Classification of Materials
	Practice	:
	Laboratory	:
Week 3	Theoretical	: Nanomaterials and Nanostructures, Classification
	Practice	:
	Laboratory	:
Week 4	Theoretical	: Nanomaterials and Nanostructures, Investigation of their Properties
	Practice	:
	Laboratory	:
Week 5	Theoretical	: Characterization of Nanomaterials
	Practice	:
	Laboratory	:
Week 6	Theoretical	: Nanoparticles, Nanofibers, Nanotubes
	Practice	:
	Laboratory	:
Week 7	Theoretical	: Structures and Properties of Nanocomposites
	Practice	:
	Laboratory	:
Week 8	Theoretical	: Nanofilm Constructions
	Practice	:
	Laboratory	:
Week 9	Theoretical	: Mid-term exam and Assessment
	Practice	:
	Laboratory	:
Week 10	Theoretical	: Nanofilm Preparation Techniques
	Practice	:
	Laboratory	:
Week 11	Theoretical	: Use of Nanotechnology in Electronics, Photovoltaics
	Practice	:
	Laboratory	:
Week 12	Theoretical	: Use of Nanotechnology in Electronics, Leds and Oleds

	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Use of Nanotechnology in Medicine
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Use of Nanotechnology in Textile Industry
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Nanocomposites, Nanodyes
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	2,00
Assignment	Yes	1	2,00
Final	No	1	2,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	8	16,00
Preparation for final	Yes	8	16,00
Attending lectures	Yes	14	28,00
Total Hours			122,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	2	0	0	0	0	0	0	0	0
2	4	3	5	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	3	3	0	2	0	0	0	0	0
5	1	1	1	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Illumination Techniques

General Description

Course Name	:	Illumination Techniques
Course Code	:	ELK 1220
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	The aim of this course is to calculate an effective, efficient and economical lighting in parallel with the theoretical information explained in the course, draw a sample project in accordance with the electrical internal installation project regulations and technical specifications, make all the calculations and make the project acceptable.
Course Contents	:	Purpose and classification of illumination. Important photometric laws. Theories of light. Basic forms that emit light. Physiological optical calculations. Fundamentals of light production. Lambs. Light sources. Lighting types and lighting fixtures. Lighting calculation. Electrical interior installation materials. Features of the architectural exercise project. Plumbing connection diagrams. Important articles of the Electrical Internal Facilities Regulation. Table loading chart. Project control.
Recommended or Required Reading	:	Özkaya M., Tüfekçi T., Lighting Technique, Birsen publishing house, 2011.
Planned Learning Activities and Teaching Methods	:	Lecture, project presentation, case study
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - Understanding and using concepts related to light, radiation and color, eye and vision, photometric quantities, laws related to illumination, physiological-optical foundations

2 - Understanding light production, distribution, economy and the effects of light on living and non-living things

3 - Understanding light sources, lighting devices and lighting components

4 - Learning how a general lighting design and calculations are made and applied, and being able to make lighting calculations of a simple system (office, building).

5 - Becoming able to understand lighting interior installation project issues

6 - Gaining the necessary engineering tools and technical report software skills for all these

Weekly Course Contents

Week 1	Theoretical :	Purpose, subject and classification of lighting. Light and vision phenomenon. Light intensity and description. Luminous intensity
	Practice :	
	Laboratory :	
Week 2	Theoretical :	Photometric laws (Cosine law, Law of inverse proportion to the square of distances, Lambert's law, Space angle projection law).
	Practice :	
	Laboratory :	
Week 3	Theoretical :	Solving sample problems related to photometric laws. Basic forms that emit light. Plane, sphere, cylinder, hemisphere.
	Practice :	
	Laboratory :	
Week 4	Theoretical :	Physiological optical calculations. Adaption. Contrast and shape sensitivity. sample problems
	Practice :	
	Laboratory :	
Week 5	Theoretical :	Fundamentals of light production. Photometric quantities. Energy flux, luminous flux, amount of light, luminous intensity. Efficiency factor.
	Practice :	
	Laboratory :	
Week 6	Theoretical :	Fundamentals of luminescent light production. Incandescent lamps, arc lamps, fluorescent lamps, discharge lamps. External characteristic of discharge lamps. Economical study of lamps.
	Practice :	
	Laboratory :	
Week 7	Theoretical :	Lighting types and lighting fixtures. Lighting components. Luminance level, flatness of illumination, photographic excitation, photometric radiance, glare, shadow, light color, glare.
	Practice :	
	Laboratory :	
Week 8	Theoretical :	Lighting calculation methods. Production Method. Factors affecting room efficiency. Room index. Illumination of rooms. Voltage drop calculation. Example problems.
	Practice :	
	Laboratory :	
Week 9	Theoretical :	Office, bank, healthcare buildings, exhibition, library, sports facility, library lighting.

	Practice :	
	Laboratory :	
Week 10	Theoretical :	Office, bank, healthcare buildings, exhibition, library, sports facility, library lighting.
	Practice :	
	Laboratory :	
Week 11	Theoretical :	Electrical interior installation materials. Switches, pipes, fuses. Features of the 1/50 scale architectural exercise project, project materials.
	Practice :	
	Laboratory :	
Week 12	Theoretical :	Preparation and drawing of a sample project within the framework of the principles of the electrical internal installation project regulation. Drawing of open and single line diagrams. Selecting the brightness level and devices. Drawing of the strong flow column diagram.
	Practice :	
	Laboratory :	
Week 13	Theoretical :	Plumbing connection diagrams. Internal electrical installation, low current and high current installations and drawings. Formation of sortie, line, column and main column lines.
	Practice :	
	Laboratory :	
Week 14	Theoretical :	Preparation of the table loading chart. Fuse selection, wire cross-section selection, voltage drop calculation
	Practice :	
	Laboratory :	
Week 15	Theoretical :	Review of sample lighting projects
	Practice :	
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	5,00
Attending lectures	Yes	15	675,00
Individual study before lecture	Yes	15	225,00
Individual study after lecture	Yes	15	225,00
Total Hours			1130,00
ECTS			38,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	1	0	0	3	5	5	1	1
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	5	5	0	0	0
4	0	0	0	0	5	5	5	0	0
5	0	0	0	0	5	5	5	0	0
6	0	0	0	0	0	5	5	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Sensors and Transducers

General Description

Course Name	:	Sensors and Transducers
Course Code	:	ELK 2101
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	1
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	3
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, to be able to provide knowledge and skills to use relevant circuits about all types of sensor
Course Contents	:	Temperature sensors, humidity sensors, speed sensors, vibration sensors, position sensors, proximity sensors, pressure sensors, flow sensors, level sensors, blow(force) sensors
Recommended or Required Reading	:	1. Gürdal, O. (2000) Algılayıcılar Dönüştürücüler in Turkish
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer, solving problem, laboratory (experimental), group working
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to set up temperature and humidity sensors

2 - To be able to set up speed, vibration, acceleration, position and proximity sensors

3 - To be able to set up pressure, flow and level sensors

Weekly Course Contents

Week 1	Theoretical	Temperature sensors

	Practice	: N/A
	Laboratory	: N/A
Week 2	Theoretical	: Temperature sensors
	Practice	: N/A
	Laboratory	: N/A
Week 3	Theoretical	: Humidity sensors
	Practice	: N/A
	Laboratory	: N/A
Week 4	Theoretical	: Speed sensors
	Practice	: N/A
	Laboratory	: N/A
Week 5	Theoretical	: Acceleration sensors
	Practice	: N/A
	Laboratory	: N/A
Week 6	Theoretical	: Acceleration sensors
	Practice	: N/A
	Laboratory	: N/A
Week 7	Theoretical	: Position sensors
	Practice	: N/A
	Laboratory	: N/A
Week 8	Theoretical	: Midterm exam
	Practice	: N/A
	Laboratory	: N/A
Week 9	Theoretical	: Proximity sensors
	Practice	: N/A
	Laboratory	: N/A
Week 10	Theoretical	: Proximity sensors
	Practice	: N/A
	Laboratory	: N/A
Week 11	Theoretical	: Pressure sensors
	Practice	: N/A
	Laboratory	: N/A
Week 12	Theoretical	: Flow sensors
	Practice	: N/A
	Laboratory	: N/A

Week 13	Theoretical	:	Level sensors
	Practice	:	N/A
	Laboratory	:	N/A
Week 14	Theoretical	:	Blow(force) sensors
	Practice	:	N/A
	Laboratory	:	N/A
Week 15	Theoretical	:	Blow(force) sensors
	Practice	:	N/A
	Laboratory	:	N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	42,00
Individual study before lecture	Yes	14	14,00
Individual study after lecture	Yes	14	14,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	10,00
Total Hours			90,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	1	0	0	0	0	0	0	0
2	0	3	2	1	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Research Methods and Techniques

General Description

Course Name	:	Research Methods and Techniques
Course Code	:	ELK 2103
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Graduation came to the stage of a student to do research on a subject of curiosity and field, to prepare a report and presentation in order to make plans, carry out the stages of preparation and writing, effective presentation of his work.
Course Contents	:	Working on a topic related to the professional field in accordance with the rules of ethics and science, preparation and presentation a research report.
Recommended or Required Reading	:	Halil SEYİDOĞLU, (2003), Scientific Research and Writing Manual, Güzem Can Publications, İstanbul.
Planned Learning Activities and Teaching Methods	:	Lecture, demonstration, research, practice, problem solving, question - answer, group work, individual teaching techniques.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to access to primary and secondary data about the study skills.

2 - To be able to gain skills on how to do source scanning and how to integrate the resources that are being accessed into the work

3 - To be able to improve both written and oral-nonverbal communication skills.

4 - To be able to support self-research ability independently

5 - To be able to increase professional field knowledge

6 - To be able to gain analytical thinking and practicing ability by investigating a scientific topic

7 - To be able to use computer, software, internet and survey work

Weekly Course Contents

Week 1	Theoretical	General description and study issues related to the course the students shared
	Practice	
	Laboratory	
Week 2	Theoretical	Sharing general information about the research methods
	Practice	
	Laboratory	
Week 3	Theoretical	Research related to the source research
	Practice	
	Laboratory	
Week 4	Theoretical	Reached to transfer the resources to collect and process the text
	Practice	
	Laboratory	
Week 5	Theoretical	Research the text of the development, organization of survey, sample surveys
	Practice	
	Laboratory	
Week 6	Theoretical	Parts of the study and the preparation of contents
	Practice	
	Laboratory	
Week 7	Theoretical	Working related to abstract, tables, figures, graphics
	Practice	
	Laboratory	
Week 8	Theoretical	Arrangement of the bibliography
	Practice	
	Laboratory	
Week 9	Theoretical	Mid-term Exam
	Practice	
	Laboratory	
Week 10	Theoretical	Control of resources
	Practice	
	Laboratory	
Week 11	Theoretical	Scientific studies, ethics, and presentation techniques
	Practice	
	Laboratory	

Week 12	Theoretical	:	Presentation of the studies done
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Presentation of the studies done
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Presentation of the studies done
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Presentation of the studies done and general assessments of the studies done
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Assignment	Yes	1	10,00
Final	No	1	1,00
Attending lectures	Yes	15	30,00
Preparation for midterm	Yes	1	20,00
Preparation for final	Yes	1	25,00
Total Hours			87,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	1	1	0	0	0	0	0	0
2	0	1	4	0	0	0	2	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	2	4	3	0	0
5	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0
7	0	0	3	4	4	5	3	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Electromechanical Control Systems

General Description

Course Name	:	Electromechanical Control Systems
Course Code	:	ELK 2105
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	With this course, students will be able to control the installation of circuit elements, and a phase control circuit elements using a three-phase induction motors to run, change direction of rotation, braking will be able to process.
Course Contents	:	Control Elements 1. Packet switches 2. Control buttons 3. Signal lights 4. Limit switches 5. Timers 6. contactors 7. Relays Protection Relays 1. Overcurrent relays 2. Voltage protection relays 3. Phase sequence relay 4. Phase protection relay Three-Phase Induction Motors Operating 1. Three-Phase Induction Motors cuts and Continuous Operation 2. Three-Phase Induction Motors with Two Different Space (Remote) Operating 3. Changing direction of rotation of three-phase asynchronous motors 4. Starting three-phase asynchronous motors resistance 5. Starting Wound Rotor Induction Motors 6. Three-Phase Induction Motors and Auto Transformer starters 7. Three-phase asynchronous motors star delta starters 8. Three-Phase Asynchronous Motors Braking 9. control of Dual-speed motors 10. Single Phase Induction Motor Control Circuits 11. Changing direction of rotation of a Phase Asynchronous Motors 12. starting to a direct current motors 13. Changing direction of rotation of DC motors 14. Braking of direct current motors
Recommended or Required Reading	:	Abdullah GORKEM Electromechanical Control Systems Yavuz TURKMEN Ceyhan GEÇTAN Control Circuits
Planned Learning Activities and Teaching Methods	:	Make a drawing of the control circuits, By mounting the control board to run into circuits.
Recommended Optional Programme Components	:	Tools needed for installation of circuits (pliers, screwdriver, stylus control, Multimeter, pensampermeter).

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to control elements to assemble, cut the three-phase asynchronous motors, run continuously and remotely

2 - To be able toThree-phase asynchronous motors give way to a variety of ways, and change the direction of rotation to the braking

3 - To be able to give way to a phase asynchronous motors, change direction of rotation, the rotor windings to give way and two-speed asynchronous motors to run asynchronous motors

Weekly Course Contents

Week 1	Theoretical :	Control Elements
	Practice :	N/A
	Laboratory :	N/A
Week 2	Theoretical :	Protection Relays
	Practice :	N/A
	Laboratory :	N/A
Week 3	Theoretical :	Three-Phase Induction Motors cuts and Continuous Operation
	Practice :	Three-Phase Induction Motors cuts and Continuous Operation
	Laboratory :	N/A
Week 4	Theoretical :	Three-Phase Induction Motors with Two Different Space (Remote) Operating
	Practice :	Three-Phase Induction Motors with Two Different Space (Remote) Operating
	Laboratory :	N/A
Week 5	Theoretical :	Changing direction of rotation of three-phase asynchronous motors
	Practice :	Changing direction of rotation of three-phase asynchronous motors
	Laboratory :	N/A
Week 6	Theoretical :	Starting three-phase asynchronous motors resistance Starting Wound Rotor Induction Motors
	Practice :	Starting three-phase asynchronous motors resistance Starting Wound Rotor Induction Motors
	Laboratory :	N/A
Week 7	Theoretical :	Three-Phase Induction Motors and Auto Transformer starters
	Practice :	Three-Phase Induction Motors and Auto Transformer starters
	Laboratory :	N/A
Week 8	Theoretical :	Three-phase asynchronous motors star delta starters
	Practice :	Three-phase asynchronous motors star delta starters
	Laboratory :	N/A
Week 9	Theoretical :	Midterm Exam Three-Phase Asynchronous Motors Breaking
	Practice :	Three-Phase Asynchronous Motors Breaking
	Laboratory :	N/A
Week 10	Theoretical :	Control of Dual-speed motors
	Practice :	Control of Dual-speed motors

	Laboratory	: N/A
Week 11	Theoretical	: Single Phase Induction Motor Control Circuits
	Practice	: Single Phase Induction Motor Control Circuits
	Laboratory	: N/A
Week 12	Theoretical	: Changing direction of rotation of a Phase Asynchronous Motors
	Practice	: Changing direction of rotation of a Phase Asynchronous Motors
	Laboratory	: N/A
Week 13	Theoretical	: starting to a direct current motors
	Practice	: starting to a direct current motors
	Laboratory	: N/A
Week 14	Theoretical	: Changing direction of rotation of DC motors, Braking of direct current motors
	Practice	: Changing direction of rotation of DC motors, Braking of direct current motors
	Laboratory	: N/A
Week 15	Theoretical	: Changing direction of rotation of DC motors, Braking of direct current motors
	Practice	: Changing direction of rotation of DC motors, Braking of direct current motors
	Laboratory	: N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Application / Practice	Yes	8	40,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	10,00
Total Hours			118,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	1	1	1	0	2	1	1
2	1	1	0	2	1	1	1	1	1
3	1	1	2	1	0	1	1	1	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Power Electronics

General Description

Course Name	:	Power Electronics
Course Code	:	ELK 2107
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	4
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, to be aimed to gain knowledge and skills about semi-conductor switching elements, rectifier and chopper circuit
Course Contents	:	Thyristors, Thyristor Trigger Circuits, Triac and Diac, Mosfets, Single Phase Controlled and Uncontrolled Rectifier Circuits, Three Phase Controlled and Uncontrolled Rectifier Circuits, Single Phase and Three Phase AA Choppers, Current and Voltage Supply Inverters.
Recommended or Required Reading	:	[1] Power Electronics, Mohan,Undeland, Robbins, Translation: Nejat Tuncay, Metin Gökaşan, Seta Boğosyan, Literatür Publications, Edition 1 September 2003. [2] Modern Power Electronics and Drivers, Bimal K. Bose, Prentice Hall PTR. [3] Power Electronics, Associate Professor. Osman Gürdal, Nobel Release Distribution, Edition 2 2000 [4] Power Electronic Control of AC Motors, JMD Murphy&FG Turnbull, Pergamon Pres, 1988.
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer, solving problem, laboratory (experimental), group working
Recommended Optional Programme Components	:	None

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to select a semiconductor switching elements

2 - To be able to set up single-phase rectifier circuits

3 - To be able to set up a three-phase rectifier circuits

4 - To be able to set up chopper circuits

5 - To be able to set up the inverter and the frequency converter circuits

Weekly Course Contents

Week 1	Theoretical	Thyristor
	Practice	
	Laboratory	
Week 2	Theoretical	Thyristor driving circuits
	Practice	
	Laboratory	
Week 3	Theoretical	Triac,diac, mosfet
	Practice	
	Laboratory	
Week 4	Theoretical	IGBT
	Practice	
	Laboratory	
Week 5	Theoretical	Single-phase full wave uncontrolled rectifiers
	Practice	
	Laboratory	
Week 6	Theoretical	Three-phase full wave uncontrolled rectifiers
	Practice	
	Laboratory	
Week 7	Theoretical	Three-phase full wave controlled rectifiers
	Practice	
	Laboratory	
Week 8	Theoretical	Single-phase AA chopper circuit
	Practice	
	Laboratory	
Week 9	Theoretical	Midterm exam
	Practice	
	Laboratory	
Week 10	Theoretical	Three-phase AA chopper circuit
	Practice	
	Laboratory	
Week 11	Theoretical	Buck and boost choppers
	Practice	
	Laboratory	

	Theoretical	:	Current-fed inverter
Week 12	Practice	:	
	Laboratory	:	
	Theoretical	:	Voltage-fed inverter
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Voltage-fed inverter
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Voltage-fed inverter
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	56,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	5,00
Preparation for final	Yes	1	5,00
Total Hours			122,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	4	4	0	0	5	0	0	0	0
2	4	4	0	0	5	0	0	0	0
3	4	4	0	0	5	0	0	0	0
4	4	4	0	0	5	0	0	0	0
5	4	4	0	0	5	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Renewable Energy Sources

General Description

Course Name	:	Renewable Energy Sources
Course Code	:	ELK 2109
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	2
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	The purpose of this course is giving information about technological and economic importance of sustainable clean energy sources by specifying the gas, renewable energy sources to fossil fuels
Course Contents	:	Basic Information and Definitions, Energy, Alternative Energy Sources for the principle, Heat Transfer, and Use of Energy Resources in the World and in Turkey, Biomass Energy, Thermal Decomposition Methods, Use of wood as energy and chemicals, Direct Burn, Bruwuetting Theoretical Principles and Methods, Briquetting Plants Major Departments of pyrolysis of Wood (Dry Distillation), Pyrolysis Process Technologies, biomass fast pyrolysis method for the biological fuel oil (bio-oil) production of Biological Fuel Oil (bio-oil) Applications, Using a Large Wood pyrolysis Plants, Gasification, Liquefaction, Use of Wood and Wood as a Chemical Compounds, Chemical Card The Quality Products of wood, Ethanol Production.
Recommended or Required Reading	:	PowerPoint presentations,
Planned Learning Activities and Teaching Methods	:	Lecture, question and answer, discussion, PowerPoint presentations
Recommended Optional Programme Components	:	N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to recognize renewable energy sources

2 - To be able to apply energy storage methods

3 - To be able to use as wood and wood chemical compounds

4 - To be able to understand the importance of renewable energy sources

Weekly Course Contents		
Week 1	Theoretical	Basic Information and Definitions
	Practice	
	Laboratory	
Week 2	Theoretical	Identification of the energy system and the introduction of renewable energy sources
	Practice	
	Laboratory	
Week 3	Theoretical	Energy, Alternative Energy Sources for the principle
	Practice	
	Laboratory	
Week 4	Theoretical	Use of Energy Resources in the World and in Turkey
	Practice	
	Laboratory	
Week 5	Theoretical	Use of wood as energy and chemicals
	Practice	
	Laboratory	
Week 6	Theoretical	Direct Burn
	Practice	
	Laboratory	
Week 7	Theoretical	Pyrolysis of Wood
	Practice	
	Laboratory	
Week 8	Theoretical	Midterm Exam
	Practice	
	Laboratory	
Week 9	Theoretical	Use of Wood and Wood Compounds as a Chemical
	Practice	
	Laboratory	
Week 10	Theoretical	Products acquired by chemical ways from wood
	Practice	
	Laboratory	
Week 11	Theoretical	Types of renewable energy sources (solar, biomass, wind energy, geothermal energy and water energy)
	Practice	

	Laboratory	:	
Week 12	Theoretical	:	Types of renewable energy sources (solar, biomass, wind energy, geothermal energy and water energy)
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Advantages and disadvantages of fossil fuels, nuclear energy and renewable energy sources
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Energy storage methods
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Energy storage methods
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	28,00
Research presentation	Yes	1	7,00
Individual study before lecture	Yes	10	10,00
Preparation for midterm	Yes	1	15,00
Preparation for final	Yes	1	30,00
Total Hours			90,00
ECTS			3,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Programmable Controllers

General Description

Course Name	:	Programmable Controllers
Course Code	:	ELK 2111
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	3
Laboratory Credits	:	0
Practice Credits	:	1
ECTS	:	5
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To be able to write to PLC and touch panel with PLC ladder diagram.
Course Contents	:	Siemens CPU-Expansion Modules-Microwin7 Software Platform
Recommended or Required Reading	:	Lecture Notes Siemens service books
Planned Learning Activities and Teaching Methods	:	Application, demonstration, expression
Recommended Optional Programme Components	:	None

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to define structure and working principals PLC and expansion modules

2 - To be able to program to PLC and expansion modules

3 - To be able to define and use wired and wireless communication protocols

4 - To be able to make digital and analog input-output and other external connections of PLC

5 - To be able to design, to program and use several automation systems

Weekly Course Contents

Week 1	Theoretical	:	Structure and working principals of PLC and expansion modules
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Program to PLC and program menu.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	External input-output connections of PLC.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Design of automation systems.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Input-output, set-reset , special memory and edge trigger relays.
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Timers and counters
	Practice	:	Timers and counters
	Laboratory	:	PLC Laboratory
Week 7	Theoretical	:	Move and compare instructions.
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Program sequence control instructions.
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Rotate, shift register and math instructions
	Practice	:	Rotate, shift register and math instructions
	Laboratory	:	PLC Laboratory
Week 11	Theoretical	:	Pulse generation and real time clock
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Analog input-outputs, interrupt and subroutine instructions.
	Practice	:	
	Laboratory	:	

	Theoretical	:	Operator and touch panels
Week 13	Practice	:	Operator and touch panels
	Laboratory	:	PLC Laboratory
	Theoretical	:	Communication protocols in automation systems
Week 14	Practice	:	Communication protocols in automation systems
	Laboratory	:	PLC Laboratory
	Theoretical	:	Application exam and assestment of application reports
Week 15	Practice	:	Application exam and assestment of application reports
	Laboratory	:	PLC Laboratory

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Individual study before lecture	Yes	12	12,00
Individual study after lecture	Yes	12	12,00
Laboratory	Yes	6	144,00
Total Hours			170,00
ECTS			6,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	0	0	4	5	0	5	0	0	0
2	0	0	4	5	0	5	0	0	0
3	0	0	4	5	0	5	0	0	0
4	0	0	4	5	0	5	0	0	0
5	0	0	4	5	0	5	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Occupational Health and Safety

General Description

Course Name	:	Occupational Health and Safety
Course Code	:	ELK 2113
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course aims to teach the risks that the students might face in their futuree careers, how to evaluate and control these risks, regulating conditions, and teach the basics of how to work in a secure environment.
Course Contents	:	Occupational health and safety, the general concepts and definitions, statistics on occupational accidents and occupational diseases, the causes of work-related accidents, and premises security threats to the environment, occupational diseases, classification and causes, accident severity and frequency rates of accidents, injuries, first aid and a variety of applications , fire, and fire protection, transportation and storage safety measures, risk assessment, occupational health and safety regulations.
Recommended or Required Reading	:	1. Lecture notes 2. Ercüment N. DİZDAR, 2003, Occupational Safety, Karaelmas University, Zonguldak. ISBN: 975-92183-8-0 3. Occupational health and safety law number 6331 and related regulations
Planned Learning Activities and Teaching Methods	:	Learning activities: Participation in the course, individual work Teaching methods: Face to face, interactive, slide show and application
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to identify and analyze the risks of accidents in business life.

2 - To be able to recognize work safety materials, to work safety in the workplace and to make improvements for safety.

3 - To be able to apply the methods of protection from occupational diseases in business life.

4 - To be able to apply first aid practices in business life.

5 - To be able to learn the legal rights and responsibilities of employers and employees on work safety.

Weekly Course Contents

Week 1	Theoretical	:	Occupational safety, occupational diseases and injuries, concepts of occupational accidents
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Statistics on occupational accidents and diseases
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	The factors that threaten the security of our environment and the measurements in order to avoid them
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	The factors that threaten the security of the buildings and the measurements in order to avoid them
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	The reasons of occupational accidents and the necessary measurements
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	The reasons of occupational accidents and the necessary measurements
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Occupational diseases and the factors causing these diseases
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Occupational diseases and the factors causing these diseases
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Risk assessment, the rates on the frequency of accidents and their intensity
	Practice	:	
	Laboratory	:	

Week 11	Theoretical	:	First-aid and implementations on a number of injuries
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	First-aid and implementations on a number of injuries
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Fire, fire extinguishing, and the ways for protection
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	The regulations for safe transportation and transfer, stocking, and safe working on aerial ladders
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Law No. 6331 on occupational health and safety, legal and criminal liabilities
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	28,00
Preparation for midterm	Yes	1	4,00
Preparation for final	Yes	1	6,00
Individual study before lecture	Yes	14	14,00
Individual study after lecture	Yes	14	14,00
Total Hours			68,00
ECTS			2,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	2	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	0
3	1	0	1	1	1	2	1	0	1
4	1	1	1	1	1	1	0	2	0
5	0	1	1	1	1	0	1	1	2

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Hydraulic Pneumatic

General Description

Course Name	:	Hydraulic Pneumatic
Course Code	:	ELK 2201
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	The purpose of this course to gain abilities about hydraulic and pnemuatic systems set-up.
Course Contents	:	1. Set-up of pneumatic systems. 2. Set-up of electro-pneumatic systems 3. Set-up of Hydraulic systems 4. Set-up of electro-hydraulic systems
Recommended or Required Reading	:	1) Pneumatic/Electro-pneumatic,Yavuz Eminoğlu 2) Pneumatic / Hydraulic Basic - Advanced Level Course Book. Festo Didactic
Planned Learning Activities and Teaching Methods	:	Teaching, demonstartion, application
Recommended Optional Programme Components	:	None

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to comprehend basic principles of hydraulics and pneumatic

2 - To be able to comprehend basic elements and characteristics of hydraulics and pneumatic

3 - To be able to comprehend working principles of hydraulics and pneumatic

4 - To be able to identify elements in drawn circuits and interpretation of running circuits

5 - To be able to select elements for a new designed circuit and construct circuit

Weekly Course Contents

Week 1	Theoretical	:	Pneumatic System Elements
	Practice	:	Pneumatic Symbols
	Laboratory	:	Control and Automation Laboratory
Week 2	Theoretical	:	Pneumatic System Desing
	Practice	:	Working prenciple of compressors
	Laboratory	:	
Week 3	Theoretical	:	Pneumatic Systems
	Practice	:	Presseure line desing
	Laboratory	:	Control and Automation Laboratory
Week 4	Theoretical	:	Electro-Pneumatic System Elements
	Practice	:	Electro-Pneumatic Symbols
	Laboratory	:	
Week 5	Theoretical	:	Electro-Pneumatic System Elements
	Practice	:	Presentation of simulation program and experimental set-up
	Laboratory	:	Control and Automation Laboratory
Week 6	Theoretical	:	Electro-Pneumatic Systems
	Practice	:	Sequential control of A+B+A-B- function
	Laboratory	:	Control and Automation Laboratory
Week 7	Theoretical	:	Electro-Pneumatic Systems
	Practice	:	Sequential control of A+B+B-A- function
	Laboratory	:	Control and Automation Laboratory
Week 8	Theoretical	:	Hydraulic System Elements
	Practice	:	Hydraulic Symbols
	Laboratory	:	
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Hydraulic Systems
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Electro-Hydraulic System Elements
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Electro-Hydraulic System Elements
	Practice	:	Presentation of simulation program and experimental set-up
	Laboratory	:	

	Theoretical	:	Electro-Hydraulic Systems
Week 13	Practice	:	Sequential control of A+B+A-B- function
	Laboratory	:	
	Theoretical	:	Electro-Hydraulic Systems
Week 14	Practice	:	Sequential control of A+B+B-A- function
	Laboratory	:	
	Theoretical	:	Electro-Hydraulic Systems
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	2,00
Assignment	Yes	5	50,00
Final	No	1	3,00
Application / Practice	Yes	5	50,00
Laboratory	Yes	5	25,00
Research presentation	Yes	1	2,00
Total Hours			132,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	5	3	1	4	4	2	1	0
2	5	5	3	1	4	4	2	1	0
3	5	5	3	1	4	4	2	1	0
4	5	5	3	1	4	4	2	1	0
5	5	5	3	1	4	4	2	1	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Professional Technical Methods

General Description

Course Name	:	Professional Technical Methods
Course Code	:	ELK 2207
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, aimed to gain knowledge and skills to make the power supply and solder.
Course Contents	:	Soldering Materials, Soldering, Printed Circuit, Plaque Placement of Materials , Placing Elements in Power Supply, Power Supply Testing, Detection of faults, Repairability
Recommended or Required Reading	:	1. Industrial Control and Fault Analysis, E.Tekin, M.Bereket, Mavi Kitaplar Publishing, 2009 2. Electronic Fault Finding and Removal Techniques 1, Önder Şişer, Altaş Publishing, 2012 3. Electrical Electronics and Measurement and Application Book, E.Tekin, M.Bereket, Mavi Kitaplar Publishing, 2007
Planned Learning Activities and Teaching Methods	:	Presentation, question and answer, laboratory , group working
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make hard-solder

2 - To be able to make power supply

3 - To be able to diagnose faults

4 - To be able to repair

Weekly Course Contents

Week 1	Theoretical	:	Soldering Materials
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Soldering Materials
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Soldering
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Soldering
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Soldering
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Soldering
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Printed Circuit
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Printed Circuit
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm Exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Printed Circuit
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Plaque Placement of Materials
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Plaque Placement of Materials , Placing Elements in Power Supply

	Practice	:	
	Laboratory	:	
	Theoretical	:	Placing Elements in Power Supply
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Power Supply Testing
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Power Supply Testing
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	588,00
Individual study before lecture	Yes	14	392,00
Individual study after lecture	Yes	14	392,00
Preparation for midterm	Yes	1	5,00
Preparation for final	Yes	1	10,00
Total Hours			1387,00
ECTS			46,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	1	2	0	0	4	0	0	4	1
2	0	2	0	0	4	0	0	4	1
3	0	2	0	0	4	0	0	4	1
4	0	2	0	0	4	0	0	4	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Professional Foreign Language

General Description

Course Name	:	Professional Foreign Language
Course Code	:	ELK 2209
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	gaining talent to comprehend a foreign language on technical level
Course Contents	:	basic grammer structures and technical words and expessions
Recommended or Required Reading	:	Modulus published by MEGEP various English magazines, sites on internet associated with learning English, Presentation Catalogues published by companies in several fairs, PhD or Master Thesis published by Univercities.
Planned Learning Activities and Teaching Methods	:	quiz, tasks and final examination
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - to be able to learn Technical the basic grammatical structures

2 - to be able to learn words and phrases related to the technical field

3 - to be able to establish sentence at basic level.

4 - to be able to establish at medium level.

Weekly Course Contents

Week 1 Theoretical : Introduction

	Practice	:	
	Laboratory	:	
	Theoretical	:	basic technical terms
Week 2	Practice	:	
	Laboratory	:	
	Theoretical	:	basic technical terms
Week 3	Practice	:	
	Laboratory	:	
	Theoretical	:	grammer analysis
Week 4	Practice	:	
	Laboratory	:	
	Theoretical	:	grammer analysis
Week 5	Practice	:	
	Laboratory	:	
	Theoretical	:	grammer analysis
Week 6	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 7	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 8	Practice	:	
	Laboratory	:	
	Theoretical	:	mid-term
Week 9	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 10	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 11	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 12	Practice	:	
	Laboratory	:	

	Theoretical	:	estabilishing sentences, reading writing
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	estabilishing sentences, reading writing
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Attending lectures	Yes	14	392,00
Individual study before lecture	Yes	20	800,00
Individual study after lecture	Yes	20	800,00
Total Hours			1993,00
ECTS			66,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	2	0	0	1
3	0	0	0	0	0	2	0	0	1
4	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Special Electric Machines

General Description

Course Name	:	Special Electric Machines
Course Code	:	ELK 2211
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, all ends of the presence of a specially designed engines, start-up aimed to gain qualifications for connecting and operating procedures.
Course Contents	:	Installing Custom motors and run-1 Correctly determine the type of stepper motors. Stepper motors can run Correctly determine the type of servo motors. Can run servo motors Correctly determine the type of universal motors. Universal motors can run Installing Custom motors and run-2 A. linear motors B. Shaded pole motors
Recommended or Required Reading	:	1. G. Bal, 'Special Electrical Machines' ISBN: 975 347 728 7, Seckin Publishing, 2004, Ankara, Turkey. 2. Altunsaçlı A, 'Electrical Machines-III' Color Offset, Iskenderun, Turkey. 3. Laboratory testing equipments, stepper, servo, universal motors, linear and shaded pole motors, computer, projection device, and a scientific calculator.
Planned Learning Activities and Teaching Methods	:	Lecture notes and learning is provided by experimental studies in the laboratory.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to accurately determine the type of universal motors and operate universal motors

2 - To be able to Correctly identify the type of stepper and servo motors and servo motors can run.

3 - To be able to recognized linear and shaded pole motors, would change aspects of commissioning and turnover to bind.

4 - To be able to recognized Brushless DC motors , connected to the circuit and can change the direction o the rotation.

Weekly Course Contents

Week 1	Theoretical	Universal Motors 1 Structure 2 The modes of operation
	Practice	N/A
	Laboratory	N/A
Week 2	Theoretical	Universal Motors 3 Types 4 Running methods
	Practice	Circuit to connect the universal motors, run and change direction of rotation.
	Laboratory	N/A
Week 3	Theoretical	Stepper Motors 1 structure
	Practice	N/A
	Laboratory	N/A
Week 4	Theoretical	Stepper Motors 2 The modes of operation
	Practice	N/A
	Laboratory	N/A
Week 5	Theoretical	Stepper Motors 3 Types
	Practice	Circuit to connect the Stepper motors, run and change direction of rotation.
	Laboratory	N/A
Week 6	Theoretical	Stepper Motors 4 Running methods
	Practice	Circuit to connect the stepper motors, run and change direction of rotation.
	Laboratory	N/A
Week 7	Theoretical	Servo Motors 1 Structure 2 The modes of operation
	Practice	N/A
	Laboratory	N/A
Week 8	Theoretical	Servo Motors 3 Types 4 Running methods
	Practice	N/A
	Laboratory	N/A
Week 9	Theoretical	Midterm Exam
	Practice	N/A
	Laboratory	N/A
Week 10	Theoretical	Servo Motors 3 Types 4 Running methods
	Practice	Circuit to connect the servo motors, run and change direction of rotation.
	Laboratory	N/A
Week 11	Theoretical	linear motors 1 Structure
	Practice	N/A
	Laboratory	N/A

	Theoretical	:	linear motors 2 The modes of operation
Week 12	Practice	:	N/A
	Laboratory	:	N/A
	Theoretical	:	linear motors 3 Types 4 Running methods
Week 13	Practice	:	Circuit to connect the linear motors, run and change direction of rotation.
	Laboratory	:	N/A
	Theoretical	:	shaded pole motors 1 Structure 2 The modes of operation
Week 14	Practice	:	N/A
	Laboratory	:	N/A
	Theoretical	:	shaded pole motors 3 Types 4 Running methods
Week 15	Practice	:	Circuit to connect the shaded pole motors, run and change direction of rotation.
	Laboratory	:	N/A

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Application / Practice	Yes	4	20,00
Individual study before lecture	Yes	13	26,00
Individual study after lecture	Yes	12	36,00
Individual study after Application / Practice	Yes	4	20,00
Preparation for midterm	Yes	1	8,00
Preparation for final	Yes	1	8,00
Total Hours			120,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	1	1	0	1	0	1	1
2	1	1	1	1	1	1	2	1	2
3	1	1	1	1	1	1	0	1	1
4	1	1	1	0	1	0	1	0	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Panel Design and Installation

General Description

Course Name	:	Panel Design and Installation
Course Code	:	ELK 2213
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	Electrical materials, selection of the project and in compliance with standards and in the assembly to the electrical panel, from device to device cable and busbar connections are correct, and is made in accordance with the standards, testing of all kinds of panels and give to Installation of the competence.
Course Contents	:	Prepare electrical panel assembly. Make to Electrical Panels Busbar, Cable and Insulator Assembly. Installation of the Electrical Panel and Electric cables.
Recommended or Required Reading	:	1. Nacar M, 'Electricity Network and Facilities' Color offset founding, printing, 2003, Iskenderun, Turkey, 2. Ozdemir A. 'Shop-a' founding, printing Ozkan, Ankara, Turkey 3. Safety in Electrical Installations (Dr.Mustafa BAYRAM Edition Beta Release) 4. Electric Indoor Plants Ordinance (EMO Publications) 5. Electrical Systems Science 1 and 2 (Ali HÜRER Routledge) 6. Electrical installations (Doç.Dr.İrfan GÜNEY M.Ü.Teknik Faculty of Education Publications)
Planned Learning Activities and Teaching Methods	:	Lecture, demonstration, and issues related to applications applied to plants.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make Electrical Panels Busbar, Cable and Insulator Assembly

2 - To be able to Install the Electrical Panel and Electric cables

3 - To be able to prepare electrical panel assembly

Weekly Course Contents

Week 1	Theoretical	to be able to prepare electrical panel assembly
	Practice	
	Laboratory	
Week 2	Theoretical	to be able to prepare electrical panel assembly
	Practice	
	Laboratory	
Week 3	Theoretical	to be able to prepare electrical panel assembly
	Practice	Prepare electrical panel assembly
	Laboratory	
Week 4	Theoretical	to be able to make to Electrical Panels Busbar, Cable and Insulator Assembly
	Practice	
	Laboratory	
Week 5	Theoretical	to be able to make to Electrical Panels Busbar, Cable and Insulator Assembly
	Practice	
	Laboratory	
Week 6	Theoretical	to be able to make to Electrical Panels Busbar, Cable and Insulator Assembly
	Practice	Make to Electrical Panels Busbar, Cable and Insulator Assembly
	Laboratory	
Week 7	Theoretical	to be able to make to Electrical Panels Busbar, Cable and Insulator Assembly
	Practice	Make to Electrical Panels Busbar, Cable and Insulator Assembly
	Laboratory	
Week 8	Theoretical	to be able to make to Electrical Panels Busbar, Cable and Insulator Assembly
	Practice	Make to Electrical Panels Busbar, Cable and Insulator Assembly
	Laboratory	
Week 9	Theoretical	Midterm Exam
	Practice	
	Laboratory	
Week 10	Theoretical	to be able to do Installation of the Electrical Panel and Electric cables
	Practice	
	Laboratory	
Week 11	Theoretical	to be able to do Installation of the Electrical Panel and Electric cables
	Practice	
	Laboratory	
Week 12	Theoretical	to be able to do Installation of the Electrical Panel and Electric cables

	Practice	:	
	Laboratory	:	
	Theoretical	:	to be able to do Installation of the Electrical Panel and Electric cables
Week 13	Practice	:	Installation of the Electrical Panel and Electric cables
	Laboratory	:	
	Theoretical	:	to be able to do Installation of the Electrical Panel and Electric cables
Week 14	Practice	:	Installation of the Electrical Panel and Electric cables
	Laboratory	:	
	Theoretical	:	to be able to do Installation of the Electrical Panel and Electric cables
Week 15	Practice	:	Installation of the Electrical Panel and Electric cables
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Application / Practice	Yes	5	125,00
Individual study before lecture	Yes	14	588,00
Individual study after lecture	Yes	14	392,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	11,00
Total Hours			1127,00
ECTS			38,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	1	2	1	1	5	3	2	5	5
2	0	1	1	1	5	3	2	5	5
3	0	2	1	1	5	3	2	5	5

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Medical Electronics

General Description

Course Name	:	Medical Electronics
Course Code	:	ELK 2215
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Osman DEMİRCİ
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	1) It is aimed to familiarize students with basic concepts of medical electronics. 2) It is aimed to familiarize students with biolectrical signals and other physiological parameters, biolectrical/physiological parameter measurement and processing.
Course Contents	:	The origin of the action potential, bioelectrical sources, and the main properties of biolectrical signals: Electroneurography, electrocardiography, electroencephalography, electromyography, electroretinography and evoked potentials. Origin and properties of other physiological parameters and their measurements: blood pressure, blood volume, blood flow, cardiac output, heart sound measurements.
Recommended or Required Reading	:	[1]John G. Webster, Medical Instrumentation , application and design, John Wiley&Sons Inc., USA. [2]Richard Aston, Prenciples of Biomedical Instrumentation and Measurement, Macmillan Publishin Company, USA. [3]The essential Physics of medical Imaging, Jerrold T. Bushberg, J. Anthony Seibert, Edwin M. Leidholdt, JR. John M. Boone , Lipicott Williams&Wilkins, USA. [4]Chris Guy, Dominic ffytche, An Introduction the Principles of Medical Imaging, Imperial College Press UK.
Planned Learning Activities and Teaching Methods	:	Lecturing
Recommended Optional Programme Components	:	None

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to be informed with Physiological definitions, human instrumentation system, the effects of transducer properties on the measurement system

2 - To be able to The dynamic characteristics of medical measurement systems

3 - To be able to to be informed with system hardware and design in medical electronics

4 - To be able to understand biolectrical signals and other physiological parameters, biolectrical/physiological parameter measurement and processing.

Weekly Course Contents

Week 1	Theoretical	:	Physiological systems in human body
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Biological signal processing and amplification
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Biopotential transducer and amplifiers
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	System hardware and design i n medical electronics
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Electrical behaviour of heart
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	ECG measurement equipments
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Electrical behaviour of brain and EEG measurement equipments
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	EMG measurement equipments
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Midterm exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	ENG-ERG measurements
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Blood ciculation and measurement of blood pressure

	Practice	:	
	Laboratory	:	
	Theoretical	:	Measurement on respiratory systems
Week 12	Practice	:	
	Laboratory	:	
	Theoretical	:	Stimulating of heart
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Radiological methods
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Radiological methods
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Assignment	Yes	5	10,00
Final	No	1	1,00
Attending lectures	Yes	14	42,00
Individual study before lecture	Yes	14	28,00
Individual study after lecture	Yes	14	28,00
Preparation for midterm	Yes	1	4,00
Preparation for final	Yes	1	6,00
Total Hours			120,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	3	0	0	0	0	0	0	0	0
2	3	0	0	0	0	0	0	0	0
3	0	2	0	0	0	0	0	0	0
4	0	0	4	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
High Voltage Technique

General Description

Course Name	:	High Voltage Technique
Course Code	:	ELK 2219
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	1. To teach the concept and calculation of the static electric field that forces electrical insulators, 2. To teach the types and theories of electrical discharge events, 3. To teach overvoltage sources, overvoltage protection and protectors, and 4. To teach the production, measurement and applications of high voltages.
Course Contents	:	What is high voltage? Why is it needed? Static electric field and basic electrode systems; Electrical discharge phenomena in gases, liquids, solids and vacuum; protection against overvoltages and overvoltages; generation of high voltages; Measurement of high voltages and high voltage applications constitute the content of the course.
Recommended or Required Reading	:	Muzaffer Özkaya, Yüksek Gerilim Tekniği, Cilt 1, Birsen Yayınevi, İstanbul, 2005. Muzaffer Özkaya, Yüksek Gerilim Tekniği, Cilt 2, Birsen Yayınevi, İstanbul, 2005. Özcan Kalenderli, Celal Kocatepe, Oktay Arıkan, Çözümlü Problemlerle Yüksek Gerilim Tekniği, Cilt 1, Birsen Yayınevi, 2015.
Planned Learning Activities and Teaching Methods	:	Lecture, Case Study, Project Based Learning
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - Being able to calculate and control the electrical strain caused by the presence of high voltage

2 - Learning the importance of shaping, sizing and positioning electrodes and insulators

3 - Knowing the formation and differences of electrical discharge types

4 - To learn the concept of insulation coordination, that is, the relationship between insulation, electrical strain and protection

5 - To learn the principles of producing and measuring high voltage

Weekly Course Contents

Week 1	Theoretical	:	Introduction. Basic concepts of the electrostatic field.
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Planar electrode systems. Concentric spherical electrode systems.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Coaxial cylindrical electrode systems.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Non-coaxial cylindrical electrode systems. Approximate calculation of the maximum electric field intensity.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Multi-insulator (dielectric) electrode systems: planar and coaxial cylindrical systems.
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	High voltage cable and bushing applications.
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Numerical methods for electrostatic field calculations.
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Introduction to discharge events. Ionization. Townsend theory. Paschen's law.
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Introduction to discharge events. Ionization. Townsend theory. Paschen's law.
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Puncture mechanism in vacuum. Streamer. Corona discharges.
	Practice	:	
	Laboratory	:	

Week 11	Theoretical	:	Surface discharges. Lightning incident. Puncture in liquid dielectrics.
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Puncture in solid dielectrics: puncture theories, parameters affecting puncture. Partial discharges.
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Causes of overvoltages and basic information about protection against overvoltages.
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Causes of overvoltages and basic information about protection against overvoltages.
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	High Voltage Transient Analysis. Connection and traveling wave problem at a connection (intersection), reflection of traveling wave.
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	5,00
Attending lectures	Yes	15	450,00
Individual study before lecture	Yes	15	225,00
Individual study after lecture	Yes	15	225,00
Total Hours			905,00
ECTS			30,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	5	1	1	4	3	0	0	3	0
2	5	1	1	3	3	0	0	2	0
3	3	1	1	3	3	0	0	2	0
4	4	1	1	3	3	0	0	4	0
5	5	1	1	3	3	0	0	4	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Special Installation

General Description

Course Name	:	Special Installation
Course Code	:	ELK 2221
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	In this course, compensation systems, lightning protection systems, earthing systems and security installations of operations aimed to gain qualifications.
Course Contents	:	Compensation systems, lightning protection systems, earthing systems, security systems installation.
Recommended or Required Reading	:	- DOĞRU, A., (2004), Electrical Installation Plans Contract and exploration planning, Has offset publishing, Kahramanmaraş. - YILMAZ, Ü., Durmuş H. (2003), Electrical Installation Project, İnkansa Matbacılık, Ankara. - HÜRER A., Electricity Profession Picture, MEB Yayınevi.
Planned Learning Activities and Teaching Methods	:	Face to face with the students in the class module, using the necessary course materials, discusses in a laboratory practices carried out.
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to make Compensation Installations

2 - To be able to light Rod Installations

3 - To be able to make earthing installation

4 - To be able to make Security Systems Installation

Weekly Course Contents

Week 1	Theoretical	:	Learning and Interpretation of electricity internal plant rules related to subject
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Learning of electricity installation set up methods and techniques.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Choosing of cables that will be used in electricity installation and the factors that are effective in cable choice.
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Investigation of temporary electricity installation in worksite
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Observation of building low current installation and preparing a project
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Observation of buildingis television installation, cable television installation and telephone installation and preparing a project
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Investigation of security systems and preparing a project
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	mid-term exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Investigation of fire alarm systems and preparing a project
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Investigation of closed loop camera systems and preparing a project
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Investigation of display and no display diaphone systems and preparing a project
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Investigation of security installations and preparing a project
	Practice	:	

	Laboratory	:	
Week 13	Theoretical	:	Definition and Importance of compensation. Observation of components
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Drawing compensation single line schematics, material selection
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Various application about compensation
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Application / Practice	Yes	14	196,00
Attending lectures	Yes	14	196,00
Individual study before lecture	Yes	14	196,00
Individual study after lecture	Yes	14	196,00
Assignment	Yes	14	196,00
Preparation for midterm	Yes	1	2,00
Preparation for final	Yes	1	2,00
Total Hours			985,00
ECTS			33,00

Program and Learning Outcomes Relations

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	5	5	3	3	4	4	2	4	1
2	4	5	3	3	4	4	2	4	1
3	5	5	3	3	4	4	2	4	1
4	3	5	3	3	4	4	2	4	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Business Administration

General Description

Course Name	:	Business Administration
Course Code	:	ELK 2203
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Asst. Prof. Dr. Cihan Alp ŞAHİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To learn the purposes, characteristics and types of enterprise, to understand the establishment stages and functions of enterprise.
Course Contents	:	The basic concepts of enterprise, purposes of enterprise, types of enterprise, choice of establishment location, business size, choice of capacity, functions of enterprise (management, production, marketing, finance)
Recommended or Required Reading	:	İsmet MUCUK, (2003), Modern Business, Türkmen Bookstore, İstanbul. İlknur KUMKALE, (2007), Business Administration Apb Bookstore, Trabzon. Zeyyat SABUNCUOĞLU ve Tuncer TOKOL,(1991), Operating, I-II Rota Ofset, Bursa.
Planned Learning Activities and Teaching Methods	:	Conferences, Applied Courses, Presentations, Seminars, Projects, Laboratory Applications (if necessary)
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to learn the basic concepts of enterprise.

2 - To be able to understand the purposes of enterprise.

3 - To be able to learn the types of enterprise.

4 - To be able to explain the establishment stages and location choice of enterprise.

5 - To be able to understand the business size, capacity and capacity types.

Weekly Course Contents

Week 1	Theoretical	:	The definition of enterprise, the basic concepts of enterprise
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	The purposes of enterprise
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	The relationships between enterprise and its environment, responsibilities of enterprise
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	The types of enterprises
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Enterprise establishment studies, choice of location
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Business size, capacity and capacity types
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	The functions of enterprise
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	The definition, characteristics and functions of management, historical development of management
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Mid-term Exam
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	The definition and characteristics of production, types of production system
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	The definition of marketing, functions of marketing management
	Practice	:	
	Laboratory	:	

	Theoretical	:	Marketing research
Week 12	Practice	:	
	Laboratory	:	
	Theoretical	:	The definition and importance of finance, financial resources of enterprise
Week 13	Practice	:	
	Laboratory	:	
	Theoretical	:	Human resources management
Week 14	Practice	:	
	Laboratory	:	
	Theoretical	:	Business interviews
Week 15	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	15	45,00
Preparation for midterm	Yes	1	20,00
Preparation for final	Yes	1	25,00
Assignment	Yes	1	15,00
Total Hours			107,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	5	0	0	0	0	0	0	3	4
2	0	0	0	0	0	0	0	3	4
3	0	0	0	0	0	0	0	3	4
4	0	0	0	0	0	0	0	3	4
5	0	0	0	0	0	0	0	3	4

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Quality Assurance and Standards

General Description

Course Name	:	Quality Assurance and Standards
Course Code	:	ELK 2205
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Osman DEMİRCİ
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course aims to teach students the standards of quality, quality safety and all aspects of the ISO 9000 Quality Assurance and Standards System so that they can apply them in their future careers.
Course Contents	:	The concept of quality, customer rights, management, leadership, control and ISO 9000 Quality Assurance and Standards System.
Recommended or Required Reading	:	1. Lecture notes 2. Standards of ISO and TSE
Planned Learning Activities and Teaching Methods	:	Learning activities: Participation in the course, individual work Teaching methods: Face to face, interactive, slide show and application
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to have information about standards, types, preparations, applications and standardization organizations.

2 - To be able to explain the concepts of quality and other related terms.

3 - To be able to apply quality, environment, occupational health standards, total quality and CE directives in business life.

4 - To be able to have knowledge about legislation about consumer rights.

Weekly Course Contents

Week 1	Theoretical	:	Development process of standardization, the definition, Subject of standardization, aims and principles
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Standardization to the manufacturer, the benefits for consumers and the economy. Turkish Standards Institute, its regulations and duties, types of certification in Turkey.
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Types of standards and standardization in Turkey
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	The concept of certification, standardization bodies.
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Metrology and calibration. Quality and quality-related concepts.
	Practice	:	Presentation of research papers on the subject
	Laboratory	:	
Week 6	Theoretical	:	Dimensions of quality and quality-related approaches.
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Quality costs and risks.
	Practice	:	Presentation of research papers on the subject
	Laboratory	:	
Week 8	Theoretical	:	Quality management system and related factors. And principles of total quality management.
	Practice	:	Presentation of research papers on the subject
	Laboratory	:	
Week 9	Theoretical	:	Midterm
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Quality control, statistical quality control and quality circles.
	Practice	:	Presentation of research papers on the subject
	Laboratory	:	
Week 11	Theoretical	:	ISO 9000 quality management system standards and the ISO14001 environmental management system standards.
	Practice	:	Presentation of research papers on the subject

	Laboratory :	
Week 12	Theoretical :	ISO18001 occupational health and safety standards, ISO22000 food safety standards.
	Practice :	Presentation of research papers on the subject
	Laboratory :	
Week 13	Theoretical :	CE directives
	Practice :	Presentation of research papers on the subject
	Laboratory :	
Week 14	Theoretical :	Consumer rights
	Practice :	Presentation of research papers on the subject
	Laboratory :	
Week 15	Theoretical :	Occupational standards
	Practice :	
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	14	42,00
Preparation for midterm	Yes	1	10,00
Preparation for final	Yes	1	12,00
Research presentation	Yes	1	12,00
Individual study before lecture	Yes	14	14,00
Individual study after lecture	Yes	14	14,00
Total Hours			106,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	4	0	0	0	0	0	0	0	4
2	0	3	2	0	0	0	0	0	0
3	0	4	0	0	0	0	0	0	0
4	3	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Innovation Management

General Description

Course Name	:	Innovation Management
Course Code	:	ELK 2217
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Assoc. Prof. Dr. Songül FİAT VAROL
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To provide the understanding of innovation and innovation management in today's business, to provide the theoretical information about how to manage innovations in product and process innovations, successfully.
Course Contents	:	Product and process innovation, innovation strategies, innovation resources and innovation management issues will be discussed.
Recommended or Required Reading	:	Ufuk Durna,İnnovation Management, Ankara: Nobel Publishing ,2002, Articles related to weekly objects.
Planned Learning Activities and Teaching Methods	:	Lecture, question and answer, case studies, classroom discussions, success stories
Recommended Optional Programme Components	:	N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To able to define the concepts related to innovation and innovation.

2 - To be able to explain types of innovation.

3 - To be able to understand the differences between product and process innovations and their importance.

4 - To be able to gain skills in finding ways to manage innovations successfully.

Weekly Course Contents

Week 1	Theoretical	Definition innovation and innovation concepts
	Practice	
	Laboratory	
Week 2	Theoretical	Innovation environment
	Practice	
	Laboratory	
Week 3	Theoretical	Innovation sources
	Practice	
	Laboratory	
Week 4	Theoretical	Innovation types
	Practice	
	Laboratory	
Week 5	Theoretical	Innovation types for companies
	Practice	
	Laboratory	
Week 6	Theoretical	Innovation process
	Practice	
	Laboratory	
Week 7	Theoretical	Innovation strategies
	Practice	
	Laboratory	
Week 8	Theoretical	Obstacles to innovation
	Practice	
	Laboratory	
Week 9	Theoretical	Mid-term
	Practice	
	Laboratory	
Week 10	Theoretical	Organizational structure and factors that are effective in innovation management
	Practice	
	Laboratory	
Week 11	Theoretical	Organizational structure
	Practice	
	Laboratory	
Week 12	Theoretical	Factors that are effective in innovation management: Leadership and culture
	Practice	
	Laboratory	

Week 13	Theoretical	:	Success stories about companies.
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Student presentations (Innovation studies of national and international companies)
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Student presentations (Innovation studies of national and international companies)
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	5,00
Final	No	1	10,00
Attending lectures	Yes	14	28,00
Research presentation	Yes	1	10,00
Total Hours			53,00
ECTS			2,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	3	0	3	2	2	0	0
2	0	1	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	1	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Entrepreneurship

General Description

Course Name	:	Entrepreneurship
Course Code	:	ELK 2223
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	2
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	3
Name of Lecturer	:	Instructor Osman GÜÇTEKİN
Type of Course Unit	:	Optional
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	This course enables to gain the key factors for the students who will be engaged to work in private sector, and also entrepreneurial cultures to those who have the potential to work. It is aimed that the students who have the potential of entrepreneurship are able to use and develop these features. Examination of the examples and creation of new ideas, legal, financial, economical evaluation of entrepreneurship will increase the motivation of the students. Students who are successful in this course will also be entitled to Small and Medium Sized Enterprises Development Organisation "ENTREPRENEURSHIP" certificate.
Course Contents	:	Testing of entrepreneurial characteristics, business idea development and creativity exercises, business plan concept and items (market research, marketing plan, production plan, production plan, management plan, financial plan), Workshop studies to consolidate business plan items, Writing and presentation of the business plan.
Recommended or Required Reading	:	1. Yavuz Odabaşı (editor), Entrepreneurship, Anadolu University Publishing no: 1567, 2004. 2. Tamer Müftüoğlu and Tülin Durukan,Entrepreneurship and Small and Medium Sized Enterprises, Gazi Book store, 2004 3. Semra Arıkan, Entrepreneurship: Basic Concepts and Some current issues, Siyasal Bookstore, 2002. 4. R. Hisrich, Michael Peters ve Dean Shepherd, Entrepreneurship, McGraw Hill, Fourth Edition, 2006. 5. G. Yukl, Leadership in Organizations, Prentice Hall, 2006 6. Leaders and the Leadership Process Readings, Self-Assessments, and Applications, Pierce, McGraw Hill, 2003 7. P.Lambing ve C.Kuehl, Entrepreneurship, Prentice Hall, 4. Edition, 2007. ISBN: 0-13-228174-0.
Planned Learning Activities and Teaching Methods	:	Narration of the course, sample case analysis, article reading, research, following the current news. Project presentations
Recommended Optional Programme Components	:	N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to question the characteristics of his own entrepreneurship from the characteristics of entrepreneurship

2 - To be able to compare the activities related to types of entrepreneurship

3 - To be able to develop his own entrepreneurship characteristics by evaluating entrepreneurship traits of successful entrepreneurship

4 - To be able to comprehend opportunities for the appropriate sector by learning about the obstacles and incentives in entrepreneurship

5 - To be able to structure the career plan as an entrepreneur by taking examples of successful entrepreneurship

Weekly Course Contents

Week 1	Theoretical	:	Basic concepts of entrepreneurship and entrepreneurship Factors affecting entrepreneurship, testing entrepreneurial characteristics,
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	Testing of entrepreneurship features, business idea development and creativity exercises
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Responsible entrepreneurship concept and sharing of experience
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	Business concept, business functions
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	Types of businesses, types of organizations
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Financial and legal responsibilities Business plan concept and items (Market research, Marketing plan)
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Financial and legal responsibilities Business plan concept and items (Market research, Marketing plan)
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Mid-term Exam
	Practice	:	
	Laboratory	:	

Week 9	Theoretical	:	Business plan concept and items (Production plan)
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Business plan concept and items (Management plan)
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Business plan concept and items (Financial Plan)
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Workshop studies on business model and business plan (Market research, Marketing plan)
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Workshop studies on business model and work plan (Production plan)
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Workshop studies on business model and work plan (management plan)
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Workshop studies on business model and business plan (Financial plan)
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	15	60,00
Individual study after lecture	Yes	15	30,00
Preparation for midterm	Yes	1	8,00
Preparation for final	Yes	1	12,00
Project	Yes	3	30,00
Total Hours			142,00
ECTS			5,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	1	1	2	2	1	1	0	1	1
2	1	1	0	1	1	1	1	2	1
3	2	1	1	1	0	1	2	1	1
4	1	1	2	0	1	0	0	0	1
5	2	2	1	1	1	1	1	1	1

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Atatürk's Principles and History of Revolution

General Description

Course Name	:	Atatürk's Principles and History of Revolution
Course Code	:	AİT 2102
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	4
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	4
Name of Lecturer	:	Instructor SERKAN CANSEVEN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	1 - Ataturk's principles and reforms, independent, democratic and secular training of generations 2 - Turkish youth, to gain confidence in national history and consciousness 3 - Basic understand the dynamics of Turkish Modernization
Course Contents	:	1 - Principles of Atatürk and purpose of the course, taught 2 - The causes of decay of the Ottoman Empire 3 - World War I and the results 4 - Response to the occupation and Mustafa Kemal Pasha 5 - National Pact and T.B.M.M. 's opening 6 - Wars and the Treaty of Lausanne
Recommended or Required Reading	:	1- Sound, I, II, III 2- Atatürk's Lectures and Statements I, II, III 3- Ataturk Way Professor Dr. Turan Feyzioğlu Professor Dr. Hamza Eroğlu Professor Dr. Mustafa Aysan 4- Çankaya Falih Rıfkı Atay 5- Atatürk's Principles and History of Turkish Revolution Professor Dr. Refik Turan Professor Dr. Mustafa Safran Professor Dr. Necdet Hayta
Planned Learning Activities and Teaching Methods	:	Maps, Computers, Slideshow, DVD, VCD
Recommended Optional Programme Components	:	None

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to comprehend developments in European history and Ottoman modernization

2 - To be able to decline the Ottoman Empire to explain the reasons

3 - To be able to learn the causes and consequences of World War I

4 - To be able to understand Turkish National Struggle,

5 - To be able to understand the foundation philosophy of the Republic of Turkey better

Weekly Course Contents

Week 1	Theoretical	:	Reading for the Purpose of the Atatürk Principles and Revolution History Class The Fall of the Ottoman Empire
	Practice	:	
	Laboratory	:	
Week 2	Theoretical	:	The Fall of the Ottoman Empire Administrative Reforms and I. Constitutionalism
	Practice	:	
	Laboratory	:	
Week 3	Theoretical	:	Reasons for the Monarchy and the Turkish Revolution
	Practice	:	
	Laboratory	:	
Week 4	Theoretical	:	World War I and the Armistice Agreement
	Practice	:	
	Laboratory	:	
Week 5	Theoretical	:	General Situation of the country against the occupation Mustafa Kemal Pasha's Response
	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Mustafa Kemal Pasha at Samsun and The Congresses
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Mustafa Kemal Pasha at Samsun and The Congresses
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Mid-term\exam
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Opening of Meclis-i Mebusan and Misak-ı Milli
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	T.B.M.M.'s Opening and Structure
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Facades, I. and II. Inonu, Sakarya War, The Great Raid, The Treaty of Mudanya
	Practice	:	

	Laboratory	:	
Week 12	Theoretical	:	The Treaty of Lausanne
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	Proclamation of the Republic, Turkey's geopolitical position
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	Foreign Policy of the Republic of Turkey
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	Overview
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Attending lectures	Yes	14	28,00
Preparation for midterm	Yes	1	3,00
Preparation for final	Yes	1	3,00
Midterms	Yes	1	1,00
Final	No	1	1,00
Individual study before lecture	Yes	14	42,00
Individual study after lecture	Yes	14	42,00
Total Hours			120,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Turkish Language

General Description

Course Name	:	Turkish Language
Course Code	:	TDL 2102
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	4
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	4
Name of Lecturer	:	Lecturer MUSTAFA YEMİŞ
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	The overall objective of this course, individuals who understand the subtlety and depth listening, and reading the Turkish language-rich, well-established and productive to show that a language, language and consciousness awaken love, pleasure and acquire the habit of reading, to adopt the core values of Turkish society; briefly thinking and communication skills of individuals to develop.
Course Contents	:	Each student in the graduate and undergraduate education, according to comprehend the main language structure and function of language-thought in terms of connectivity, through written and oral expression, the Turkish right and gain the ability to use beautiful, these rules and native speakers of the language in an awareness of judges and they will have to make. The perfect way to express ideas in accordance with the purpose of rhetoric, including the necessary rules (speaking) knowledge of each profession for educated young people has become a very important need. In this regard, given to institutions of higher education courses in Turkish language, Turkish, and literature courses in high schools as a continuation of the rhetoric, especially in the field will be useful to intensify. On the other hand, a written essay as well as young people, to acquire the habit of speaking correctly and effectively is an issue that should not be neglected. Western countries, drawing upon the books written on this topic, Turkish course programs to address the audience, it is possible to teach techniques and methods of the rule. In this regard, particularly as Ataturk, the Turkish speecher's valuable speech will be taken to benefit from the texts.
Recommended or Required Reading	:	Aksan, Dogan, Every Direction Language / Linguistics with Main Lines, c.1,2,3, Turkish Language Institution, 1979-1982 Aksoy, Ömer Asım, Dictionary of Proverbs, İnkilap Bookstore, January 1988 Aksoy, Ömer Asım, Dictionary of Idioms, İnkilap Bookstore, January 1988 Atatürk, Mustafa Kemal, Speech Banguoğlu, Tahsin, Turkish Grammer, Turkish Language Institute Publications, 2000 Bozkurt, Fuat, Turkish, Istanbul, 1975 Buckley, Reid, Speaking at the Community, System Publishing, May 2001 Dilçin, Cem, New Screening Dictionary, Ankara, 1983 Ergin, Muharrem, Turkish Language for Universities, Bayrak Publications, 2002 Gencan, Tahir Nejat, Grammar, Ayraç Publishing House, October 2001 Karaalioğlu, Seyit Kemal, Composition Art, Istanbul, January 1999 Karahan, Leyla, Türkçede Syntax, Akçağ Publications, 1999 Kudret, Cevdet, Literature Information by Examples, c. 1, 2, İnkılap Bookstore, 198(Koç, Nurettin, New Grammar, Istanbul, 1990 Moran, Berna, A Critical Look at Turkisl Names, c. 1, 2, 3, Communication Publications, 1983-1994 Özdemir, Emin, Güzel an

Effective Speech Art, Remzi Bookstore, January 1999 Özen, Mustafa Nihat, Introduction to Writing Art and Composition, İstanbul, 1971

Planned Learning Activities and Teaching Methods : Description, discussion, presentation, brainstorming.

Recommended Optional Programme Components : N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to explain the characteristics of Turkish language by sensing its usage procedure with examples.

2 - To be able to express the function, dimensions of language and its relationship with thought, culture, and society.

3 - To be able to distinguish between the concepts of spoken language and written language;

4 - To be able to analyze a text they read or follow a program they watch.

5 - To be able to correctly and affectively express their feelings, thoughts, impressions, observations both in written and spoken language.

6 - To be able to identify the historical background of Turkish and its location among world languages;

7 - To be able to apply the basic concepts of morphology;

8 - To be able to explain the concepts about syntax and semantics.

9 - To be able to identify the mistakes in the usage of the language and show them on the texts.

10 - To be able to become an individual who is tolerant and cares about his values, and also, someone who can find solutions to the problems and correctly express his ideas about these problems both in written and spoken language.

Weekly Course Contents

Week 1
- Theoretical : What is language? In people’s life the importance of language as a social institution. Relationship between language and culture
- Practice :
- Laboratory :

Week 2
- Theoretical : Language in terms of structure and origin. Place of Turkish language among world languages.
- Practice :
- Laboratory :

Week 3
- Theoretical : The development of Turkish written language. Historical stages of Turkish written language.
- Practice :
- Laboratory :

Week 4
- Theoretical : The current status of the Turkish language, expansion areas of the Turkish language.
- Practice :
- Laboratory :

Week 5
- Theoretical : Phonetic, sounds in Turkish and its classification.

	Practice	:	
	Laboratory	:	
Week 6	Theoretical	:	Turkish sound features and sound knowledge of the rules The structure of syllables in Turkish, syllable types, stress and intonation
	Practice	:	
	Laboratory	:	
Week 7	Theoretical	:	Midterm-exam
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Spelling rules and application. Mid-term exam.
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Spelling rules and application. Mid-term exam.
	Practice	:	
	Laboratory	:	
Week 10	Theoretical	:	Punctuation and its applications.
	Practice	:	
	Laboratory	:	
Week 11	Theoretical	:	Morphology, lexis structure, word formation.
	Practice	:	
	Laboratory	:	
Week 12	Theoretical	:	Construction and suffixes, word analysis.
	Practice	:	
	Laboratory	:	
Week 13	Theoretical	:	The word types. Noun, adjective.
	Practice	:	
	Laboratory	:	
Week 14	Theoretical	:	The word types. Adverb, pronouns, prepositions, conjunctions and interjections
	Practice	:	
	Laboratory	:	
Week 15	Theoretical	:	The word types. Verbs, gerunds, infinitives, active-passive.
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Assignment	Yes	1	4,00
Final	No	1	1,00
Attending lectures	Yes	14	28,00
Individual study before lecture	Yes	14	42,00
Individual study after lecture	Yes	14	42,00
Preparation for midterm	Yes	1	4,00
Preparation for final	Yes	1	4,00
Total Hours			126,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	4	3	2	0	0	3	4	4	4
5	0	0	0	0	0	0	3	4	4
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	3	4	0	4	0	3	4	0	0
10	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Foreing Language

General Description

Course Name	:	Foreing Language
Course Code	:	YDI 2102
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	4
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	4
Name of Lecturer	:	Instructor EMEL GENÇ
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	The aim of this course is to provide the first year students with the opportunity of getting familiar with basic English
Course Contents	:	Elementary level vocabulary, grammar and four skills of English.
Recommended or Required Reading	:	Headway-Elementary (Oxford)
Planned Learning Activities and Teaching Methods	:	Lecture, 2: Question-Answer, 3: Discussion, 4: Drills and Practice
Recommended Optional Programme Components	:	N/A

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to understand basic English grammar.

2 - To be able to grasp the meaning of basic vocabulary.

3 - To be able to speak, read and write in English at Elementary Level.

4 - To be able to introduce yourself.

Weekly Course Contents

Week 1 Theoretical : regular/irregular verbs

	Practice	:	Writing telling a story
	Laboratory	:	
Week 2	Theoretical	:	Unit 7 Introducing people time expressions
	Practice	:	reading sıxty years of flight
	Laboratory	:	
Week 3	Theoretical	:	unit 8 countable and uncountable nouns how much/how many
	Practice	:	reading and speaking "The history of the sandwich" okuma parçasını okuyup anlamak Your favourite recipe bahsetmek
	Laboratory	:	
Week 4	Theoretical	:	some/any
	Practice	:	Listening "What's your favourite sandwich"
	Laboratory	:	
Week 5	Theoretical	:	unit 9 Comparatives Have got/has got Superlatives
	Practice	:	Reding " Mega cities"
	Laboratory	:	
Week 6	Theoretical	:	adjectives Unit 10 Present continuous tense in/on/at
	Practice	:	Describing a flat Writing Comparing people you know
	Laboratory	:	
Week 7	Theoretical	:	Midterm Exam
	Practice	:	
	Laboratory	:	
Week 8	Theoretical	:	Present continuous tense in/on/at Simple present& present continuous
	Practice	:	
	Laboratory	:	
Week 9	Theoretical	:	Present continuous tense in/on/at Simple present& present continuous
	Practice	:	Reading "Living in Space"
	Laboratory	:	
Week 10	Theoretical	:	Unit 11 going to/will making suggestions
	Practice	:	Writing Describing a holiday"
	Laboratory	:	
Week 11	Theoretical	:	Unit 11 Simple past& present perfect
	Practice	:	speaking Talking about you Have you ever .....?
	Laboratory	:	
Week 12	Theoretical	:	Simple past& present perfect tense revision
	Practice	:	Talk Survey 'What can you do?' Reading and speaking 'Super Children' Writing letters for business applicants.
	Laboratory	:	

Week 13	Theoretical	:	Unit 6 could Was born homonym for
	Practice	:	Using 'could' for past skills. Define where and when you are born. Finding the same pronounced different words.
	Laboratory	:	
Week 14	Theoretical	:	Revision
	Practice	:	Overview
	Laboratory	:	
Week 15	Theoretical	:	Overview
	Practice	:	
	Laboratory	:	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Midterms	Yes	1	1,00
Final	No	1	1,00
Attending lectures	Yes	12	36,00
Individual study before lecture	Yes	12	36,00
Individual study after lecture	Yes	12	36,00
Preparation for midterm	Yes	12	12,00
Total Hours			122,00
ECTS			4,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0

MANİSA VOCATIONAL SCHOOL OF TECHNICAL SCIENCES - Electricity
Vocational Training in Workplace

General Description

Course Name	:	Vocational Training in Workplace
Course Code	:	MYO 2002
Qualification Level	:	Short Cycle
Qualification Degree	:	PreBachelor Degree
Course Language	:	Turkish
Theoretical Credits	:	5
Laboratory Credits	:	0
Practice Credits	:	0
ECTS	:	18
Name of Lecturer	:	Instructor Tuğberk ÖZMEN
Type of Course Unit	:	Compulsory
Mode of Delivery	:	Face-To-Face
Prequisite and Co-requisites	:	N/A
Objectives of the Course	:	To develop students' knowledge, skills, attitudes and working habits in their learning periods, skills and experiences in laboratory and workshop practices, to provide their responsibilities, relationships, organization and production processes and new technologies to learn.
Course Contents	:	To find opportunity to apply their knowledge in public or private organizations in accordance with the lessons they have seen, to apply production and service processes in the workplace.
Recommended or Required Reading	:	Manisa Celal Bayar University Sector Applications Education Directive (https://sus.cbu.edu.tr/ISS/Application/Content/HomePage/Files/SUS-Yonerge.pdf)
Planned Learning Activities and Teaching Methods	:	Lecture, Drilland Practice, Demonstration, Show Work, Group Work, Experimental / Laboratory, Individual Study, Project Based Learning
Recommended Optional Programme Components	:	

Learning Outcomes

Upon successful completion of this course, the enrolled students will be gaining the following knowledge, skills and competences ;

1 - To be able to prepare for business

2 - To be able to be ready to group work

3 - To be able to improve knowledge and skill of production methods

4 - To be able to understand the importance of quality and control in manufacturing

Weekly Course Contents

Week 1	Theoretical	:	Introducing the internship, studying the physical possibilities of the employer. Orientation. Examination of work flow charts.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 2	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 3	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 4	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 5	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 6	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 7	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 8	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 9	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	
Week 10	Theoretical	:	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice	:	Inspection, observation and reporting of work done
	Laboratory	:	

Week 11	Theoretical :	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice :	Inspection, observation and reporting of work done
	Laboratory :	
Week 12	Theoretical :	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice :	Inspection, observation and reporting of work done
	Laboratory :	
Week 13	Theoretical :	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice :	Inspection, observation and reporting of work done
	Laboratory :	
Week 14	Theoretical :	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice :	Inspection, observation and reporting of work done
	Laboratory :	
Week 15	Theoretical :	To do maintenance, repair and assembly applications related to the field of industry. Making related applications.
	Practice :	Inspection, observation and reporting of work done
	Laboratory :	

ECTS Workload

Activity Type	Is in Semester	Number	Calculated Activity Workload
Application / Practice	Yes	15	120,00
Field study	Yes	15	60,00
Workshop	Yes	15	120,00
Short cycle-Theoretical	Yes	15	120,00
Short cycle-Practice	Yes	15	60,00
Internship-Competency	Yes	15	60,00
Total Hours			540,00
ECTS			18,00

Program and Learning Outcomes Relations

	1	2	3	4	5	6	7	8	9
1	4	5	3	2	2	5	5	5	4
2	3	3	3	3	3	3	3	3	3
3	2	2	3	2	2	5	5	5	5

4	2	2	3	3	3	3	3	3	3